DAVID Y. IGE
Governor

JOSH GREEN
Lt. Governor

FILE COPY

MAR 23 2019

JAMES J. NAKATANI
Executive Director

STATE OF HAWAII
AGRIBUSINESS DEVELOPMENT CORPORATION
235 S. Beretania Street, Room 205
Honolulu, HI 96813
Phone: (808) 586-0186 Fax: (808) 586-0189

March 11, 2019

Scott Glenn, Interim Director
Office of Environmental Quality Control
Department of Health, State of Hawaii
235 S. Beretania Street, Room 702
Honolulu, Hawaii 96813

Dear Mr. Glenn:

RE: Draft Environmental Assessment and Anticipated Finding of No Significant Impact for the Proposed Whitmore Community Food Hub Complex, Wahiawā, O'ahu, TMKs (1) 7-1-002:009, 004 (POR.), 022 (POR.), 023.

With this letter, the State of Hawaii Department of Agriculture, Agribusiness Development Corporation (ADC) hereby transmits the Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA-AFONSI) for the proposed Whitmore Community Food Hub Complex, TMKs (1) 7-1-002:009, 004 (POR.), 022 (POR.), 023, on the Island of O'ahu, for publication in the next available edition of *The Environmental Notice*.

Attached is a completed OEQC Publication Form, one (1) copy of the DEA/ AFONSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

Should you have any questions, please contact Ken Nakamoto at (808), 973-9607 or the authorized agent of this project, Theresa Dean, of PBR HAWAII at (808) 521-5631.

Sincerely,

James J. Nakatani
Executive Director

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OFC. OF ENVIRONMENTAL QUALITY CONTROL

Enclosures: One (1) hard copy of DEA-FONSI
One (1) hard copy of OEQC Publication Form
One (1) CD containing the DEA-FONSI, OEQC Publication Form and summary

19-291

AGENCY
PUBLICATION FORM

Project Name:	Whitmore Community Food Hub Complex
Project Short Name:	Whitmore Food Hub
HRS §343-5 Trigger(s):	Use of State lands and funds. Improvements and/or connections to, and/ or easements across, State or County facilities and lands in relation to infrastructure improvements for public facilities, roadways, water, sewer, utility, and drainage facilities.
Island(s):	O'ahu
Judicial District(s):	Wahiawā
TMK(s):	(1) 7-1-002:009, 004 (POR.), 022, 023
Permit(s)/Approval(s):	Lane Use/Occupancy Permit for Construction Activity State Department of Health Noise Permit National Pollutant Discharge Elimination System (NPDES) Permit Grading/Building Permits Conditional Use Permit (major and/or minor)
Proposing/Determining Agency:	Hawai'i Department of Agriculture, Agribusiness Development Corporation
Contact Name, Email, Telephone, Address	Ken Nakamoto 235 South Beretania Street, Ste. 205 Honolulu, Hawaii 96813 Phone: (808) 586-0087 Email: Ken.T.Nakamoto@hawaii.gov
Accepting Authority:	(for EIS submittals only) N/A
Contact Name, Email, Telephone, Address	N/A
Consultant:	PBR HAWAII
Contact Name, Email, Telephone, Address	Theresa Dean 1001 Bishop Street, Suite 650 Honolulu, HI 96813 Phone: (808) 521-5631 Email: tdean@pbrhawaii.com *Comments may also be submitted online at: http://whitmorefoodhub.commentinput.com

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

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

Project Summary

Hawai'i Department of Agriculture, Agribusiness Development Corporation proposes the Whitmore Community Food Hub on the parcel currently occupied by the Whitmore Agricultural Tech Park, formerly the Dole Company Operation Facility, south of Whitmore Village. The complex is designed to pool services for the aggregation, processing, storage, marketing and distribution of locally produced foods by small growers throughout the O'ahu central plain. The project aims to create a post-harvest facility that meets the requirements of the Food Safety Modernization Act (FSMA), while integrating the logistical spaces of the Food Hub. The proposed project consists of retaining current assets from the previous operation facility, constructing a pathology greenhouse as part of a larger agricultural research strategy, and then integrating all aspects of the food hub in two phases: an initial investment phase and a full buildout phase. The project will encompass approximately 34 acres and include TMK parcels (1) 7-1-002:009, 004 (POR.), 022, 023.



John Lawler Whitmore in pineapple fields, ca. 1910.

WHITMORE COMMUNITY FOOD HUB COMPLEX

DRAFT ENVIRONMENTAL ASSESSMENT / ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT

HAWAI'I DEPARTMENT OF AGRICULTURE:
Agribusiness Development Corporation

This document and all ancillary documents were prepared under my direction and in accordance with the content requirements of Chapter 343, Hawai'i Revised Statutes, and Title 11, Chapter 200, Hawai'i Administrative Rules.

PREPARED BY:

PBR HAWAII
& ASSOCIATES, INC.

MARCH 2019

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SUMMARY

Project Name:	Whitmore Community Food Hub Complex
Location:	Wahiawā, Oʻahu, Hawaiʻi
Judicial District:	Wahiawā
Proposing/Determining Agency:	Hawaiʻi Department of Agriculture, Agribusiness Development Corporation 235 South Beretania Street, Ste. 205 Honolulu, Hawaii 96813 Contact: Ken Nakamoto Phone: (808) 586-0087 Email: Ken.T.Nakamoto@hawaii.gov
Tax Map Keys (TMK):	(1) 7-1-002:009, 004 (POR.), 022, 023.
Recorded Fee Owner:	Agribusiness Development Corporation
Land Area:	Approximately thirty-four (34) acres
Existing Use:	Whitmore Agricultural Tech Park
Proposed Action:	Development of a large post-harvest facility, public spaces, agricultural workforce rental housing, and water storage infrastructure.
Need for Environmental Assessment	Use of State lands and funds. Project will also include improvements and/or connections to, and/or easements across, County facilities and lands in relation to infrastructure improvements for public facilities, roadways, water, sewer, utility, drainage or other facilities. While the specific nature of each improvement is not known at this time, the EA is intended to address all current and future instances involving the use of State and/or County lands and funds relating to the project.

Current Land Use Designations:	*State Land Use:* Agricultural, Urban *County Zoning:* AG-1 (Restricted Agriculture) *Special Management Area (SMA):* Outside SMA
Major Approvals Required or Anticipated:	Lane Use/Occupancy Permit for Construction Activity State Department of Health Noise Permit National Pollutant Discharge Elimination System (NPDES) Permit Grading/Building Permits Conditional Use Permit (major and/or minor)
Alternatives Considered:	Alternatives considered: 1) No Action Alternative 2) Alternative 1: Implement Phase I Only 3) Alternative 2: Implement the Main Street or Village Green Plan

Potential Impacts and Mitigation Measures:	Short-term construction impacts to air quality, noise, solid waste generation, traffic, parking, storm water quality/quantity are anticipated. The Agribusiness Development Corporation will address these impacts through compliance with County and State rules, regulations, permit, and variance requirements regarding fugitive dust, community noise control, and non-point source discharges. In addition, best management practices will be implemented which include structural and non-structural controls designed to inhibit run-off, erosion, and fugitive dust.
Anticipated Determination:	Anticipated Finding of No Significant Impact (FONSI)

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ACRONYMS

ACM	Asbestos containing materials
ADA	Americans with Disabilities Act
ADC	Agricultural Development Corporation
AGL	Above ground level
AIS	Archaeological Inventory Survey
AMP	Archaeological Monitoring Plan
AMSL	Above Mean Sea Level
BMP	Best Management Practices
ICAP	Center for Island Climate Adaptation and Policy
CCH	City and County of Honolulu
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CIA	Cultural Impact Assessment
CIP	Capital Improvement Project
COSCP	Central Oahu Sustainable Communities Plan
CWRM	Commission on Water Resource Management
CZM	Coastal Zone Management Program
dB	Decibel
dBA	A-weighted decibel
DAR	DLNR Division of Aquatic Resources
DBEDT	Department of Business, Economic Development & Tourism
DDC	City and County of Honolulu Department of Design & Construction
DLNR	State of Hawai‘i Department of Land & Natural Resources
DOA	State of Hawai‘i Department of Agriculture
DOH	State of Hawai‘i Department of Health
DTS	City and County of Honolulu Department of Transportation Services
EA	Environmental Assessment
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
ESH	Environmental Health Specialist
FEMA	Federal Emergency Management Agency

FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FSMA	Food Safety Modernization Act
HAR	Hawai‘i Administrative Rules
HFD	Honolulu Fire Department
HI-EMA	State of Hawai‘i Hawai‘i Emergency Management Agency
HIOSH	Hawai‘i Occupational Safety and Health Division
HRS	Hawai‘i Revised Statutes
ISS	inspection scheduling system
LBP	Lead based paint
LCA	Land Commission Award
Ldn	Average day-night noise level
LED	Light emitting diode
Leq	Hourly average noise levels
LID	Low Impact Development
LOS	Levels of Service
LSB	University of Hawai‘i Land Study Bureau
LUST	Leaking Underground Storage Tank
MAR	Mobility Analysis Report
MGD	Million gallons per day
MMP	Multi-Modal Plan
mph	Miles per hour
MUTCD	Manual on Uniform Traffic Control Devices
NCTAMS PAC	Naval Computer and Telecommunications Area Master Station Pacific
NFIP	National Flood Insurance Program
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NSA	National Security Agency
NWI	National Wetlands Inventory
OEQC	State of Hawai‘i, Office of Environmental Quality Control
OSHA	Federal Occupational Safety and Health Act
OSHCO	Occupational Safety and Health Compliance Officer

PCB	Polychlorinated Biphenyl
PUMA	Public Use Microdata Area
REC	Recognized Environmental Condition
ROW	Right of Way
RPT	Real Property Tax
sf	square foot
SLR	Sea level rise
SHPD	State Historic Preservation Division
SMA	Special Management Area
TMK	Tax Map Key
UIC	Underground injection control
USFWS	United States Fish and Wildlife Service

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1 INTRODUCTION

This Environmental Assessment (EA) is prepared in accordance with Chapter 343, Hawai'i Revised Statutes (HRS) for the Whitmore Community Food Hub Complex construction. This EA contains information in satisfaction of the requirements under Title 11, Chapter 200, Hawai'i Administrative Rules (HAR) for an EA.

1.1 PROJECT SUMMARY

The Whitmore Community Food Hub is proposed on the parcel currently occupied by the Whitmore Agricultural Tech Park, formerly the Dole Company Operation Facility, south of Whitmore Village. The complex is designed to pool services for the aggregation, processing, storage, marketing and distribution of locally produced foods by small growers throughout the O'ahu central plain. The project aims to create a post-harvest facility that meets the requirements of the Food Safety Modernization Act (FSMA), while integrating the logistical spaces of the Food Hub. One of the first uses that will be included is facilities for agricultural research in the form of a research greenhouse. This will be the first manifestation of the "Research & Innovation Node".

With a research component, it is envisioned that a range of employment opportunities will be provided in the Whitmore Community Food Hub, which is within walking distance of most of Whitmore Village. To address one of the biggest issues facing farmers, the availability of workforce, it is possible the site may eventually include agricultural workforce affordable rental housing. To further integrate with the surrounding neighborhood, the site will be designed to be more accessible to the public, including sidewalks along the Whitmore Avenue frontage connecting Whitmore Community Park to Kahi Kani Park, with a path to the southern point of the property overlooking Kaukonahua Stream, as well as open space for gatherings, such as a farmer's market.

The "program" for this project consists of retaining current assets from the previous operation facility, constructing a pathology greenhouse as part of a larger agricultural research strategy, and then integrating all aspects of the food hub in phases.

Phase I is envisioned to include the construction of: a 22,360 square foot research facility including a research greenhouse and office space ("Research & Innovation Hub"), a 'pioneer investment' warehouse building(s) totaling 72,000 square feet, and a tenant food production facility and food producer totaling 60,000 square feet. The warehouse would be built on the western end of the property. The research greenhouse could be located near the eastern edge of the property. Due to wastewater infrastructure constraints, either a new gravity wastewater line connection to the Wahiawā WWTP or a new R-1 wastewater treatment system may be proposed on site at the location of the abandoned Whitmore WWTP. System designs will be in

compliance with the Guidelines for the Treatment and Use of Recycled Water (DOH Wastewater Branch 2002). If an onsite wastewater solution is selected, the project also proposes to construct non-potable water storage tanks with at least 720,000 gallon total capacity for fire protection. Phase I will also include 3,000 square feet of open space for a farmer's market.

In Phase II, there is adequate area on the project site for expanding the Food Hub. Depending on the needs of farmers, up to 288,000 square feet under roof can be added to the initial 72,000 warehouse space constructed during Phase I. The final build-out of a logistics yard surrounding the warehouse(s) will also be completed. Phase II may also include room for agricultural workforce rental housing (to be developed by others). For planning purposes, the agricultural workforce rental housing concept is currently envisioned to include up to 100 single occupancy dwelling units (around 250 to 300 square feet a unit) and parking for approximately 50 cars. However, there is currently no design for building the proposed workforce housing. ADC will not develop any affordable workforce housing on the site but may lease the property to HHFDC or a private developer to develop and operate such a product.

1.2 LOCATION

The proposed Whitmore Community Food Hub will be located on the Central Oʻahu plain in the town of Wahiawā. Currently the proposed location is bordered by Aliʻi Agriculture Farms to the west and a portion of the Whitmore Village residential development to the east. The site is connected (via Whitmore Avenue) to Kamehameha Highway, a major arterial roadway which feeds directly to the H-2 freeway and, subsequently, downtown Honolulu. This makes the site a prime location as it is conveniently located and easily accessible to local farmers and connected to major transportation networks for the distribution of goods.

1.3 SURROUNDING LAND USES

The project location is surrounded by residential, agricultural, and recreational uses. A single family residential development is located east of the project site and the Aliʻi Agricultural Farms is on the adjacent parcel to the west. The State of Hawaii is the predominant landowner in the area with the Office of Hawaiian Affairs owning the parcel containing the Kukaniloko Birthing Stones west of Kamehameha Highway, and the Agribusiness Development Corporation owning large agricultural lots. Further east of the project site is Naval Computer and Telecommunications Area Master Station Pacific (NCTAMS PAC). To the northeast is National Security Agency (NSA) Hawaii (which is accessed via Saipan Drive). North of the project location is Green World Coffee Farm, a small coffee farm and shop, situated on the corner of Kamehameha Highway and Kamananui Road where a number of tourists frequent on their way to the North Shore. A small historical plantation camp, Poamoho Camp, is located just south of the Dole Plantation and Helemano Plantation. Downtown Wahiawā is immediately south of the project area and is

dominated by single family homes along with a few schools and community parks. The main access road, Kamehameha Highway, is lined with small shops, restaurants and convenience stores while the smaller side streets connect to grocery stores, churches, a transit center, wastewater treatment facility and solid waste collection facility.

1.4 LAND OWNERSHIP

The Agribusiness Development Corporation is the recorded fee owner of TMK (1) 7-1-002:009; (1) 7-1-002:004 and (1) 7-1-002:023. The project scope also includes an onsite wastewater treatment pond on TMK (1) 7-1-002:022, which is currently owned by the City and County of Honolulu. The Agribusiness Development Corporation is currently in negotiations with the City to acquire this parcel.

1.5 IDENTIFICATION OF PROPOSING / DETERMINING AGENCY

The proposing/ determining agency is the State of Hawai‘i Department of Agriculture, Agribusiness Development Corporation.

Contact: State of Hawai‘i Department of Agriculture
Agribusiness Development Corporation
ATTN: Ken Nakamoto
235 South Beretania Street, Ste. 205
Honolulu, Hawai‘i 96813
Phone: (808) 586-0087
Email: ken.t.nakamoto@hawaii.gov

1.6 IDENTIFICATION OF ENVIRONMENTAL CONSULTANT

PBR HAWAII is the Agribusiness Development Corporation’s planning consultant and agent for this environmental assessment.

Contact: Theresa Dean
Planner
PBR HAWAII
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813
Phone: (808) 521-5631
Fax: (808) 523-1402
Email: tdean@pbrhawaii.com

1.7 COMPLIANCE WITH STATE OF HAWAI'I ENVIRONMENTAL LAWS

Preparation of this document is in accordance with the provisions of Chapter 343, HRS and Title 11, Chapter 200, HAR pertaining to Environmental Assessments. Section 343-5, HRS identifies nine types of actions that "trigger" compliance, which requires an EA. The use of State or County funds and/or lands is one of these "triggers." The preparation of an EA is required because the proposed Whitmore Community Food Hub is located on State lands and will use State funds. It will also include improvements and/or connections to, and/or easements across, State or County facilities and lands in relation to infrastructure improvements for public facilities, roadways, water, sewer, utility, and drainage facilities. While the specific nature of each improvement is not known at this time, the EA is intended to address all current and future instances involving the use of State and/or County lands and funds relating to the project.

1.8 IDENTIFICATION OF PARTIES CONSULTED

The following agencies, organizations and businesses were notified of the preparation of this Draft EA and were asked to provide comments and/or information (refer to Section 8.1).

Board of Water Supply
Department of Community Services
Department of Customer Services
Department of Design and Construction
Department of Emergency Services
Department of Enterprise Services
Department of Environmental Services
Department of Facility Maintenance
Department of Land Management
Department of Parks and Recreation
Department of Planning and Permitting
Department of Transportation Services
Fire Department
Police Department
State Senator Donovan Dela Cruz
State Representative Lei Learmont
Council Member Ernest Martin
DBEDT - Energy Division
DBEDT - Land Use Commission
DBEDT - Office of Planning
Department of Accounting and General Services
Department of Agriculture
Department of Business, Economic Development & Tourism
Department of Defense
Department of Education
Department of Hawaiian Home Lands
Department of Health
Department of Health - Clean Air Branch
Department of Health - Environmental Planning Office
Department of Human Services
Department of Labor and Industrial Relations

Department of Land and Natural Resources
Department of the Attorney General
Department of Transportation
Department of Transportation - Highways
DLNR - Historic Preservation Division
Hawai‘i Housing Finance and Development Corporation
Hawai‘i Community Development Authority
Office of Environmental Quality Control
Office of Hawaiian Affairs
UH Water Resources Research Center
U.S. Army Corps of Engineers
U.S. Army - Corps of Engineers
U.S. Fish and Wildlife Service
U.S. Fish and Wildlife Service
U.S. Food and Drug Administration
Environmental Protection Agency
Department of Agriculture NRCS
DOI Geological Survey - Pacific Islands Water Science Center
Naval Computer and Telecommunications Area Master Station Pacific
Hawaiian Electric Company, Inc.
Spectrum
Hawaiian Telecom
Wahiawā-Whitmore Village Neighborhood Board No. 26 Chair Jeanne Ishikawa
Green World Coffee Farm
Dole Plantation
Helemano Plantation
Helemano Farms LLC

1.9 STUDIES CONTRIBUTING TO THIS ENVIRONMENTAL ASSESSMENT

The analyses contained in this EA has been developed from site visits, generally available information regarding the characteristics of the site and surrounding areas, and technical studies prepared specifically for the project. The technical studies are provided as appendices to this EA include:

- Mobility Analysis Report
- Preliminary Engineering Report
- Historic Properties Inventory Survey
- Cultural Impact Assessment
- Flora and Fauna Study

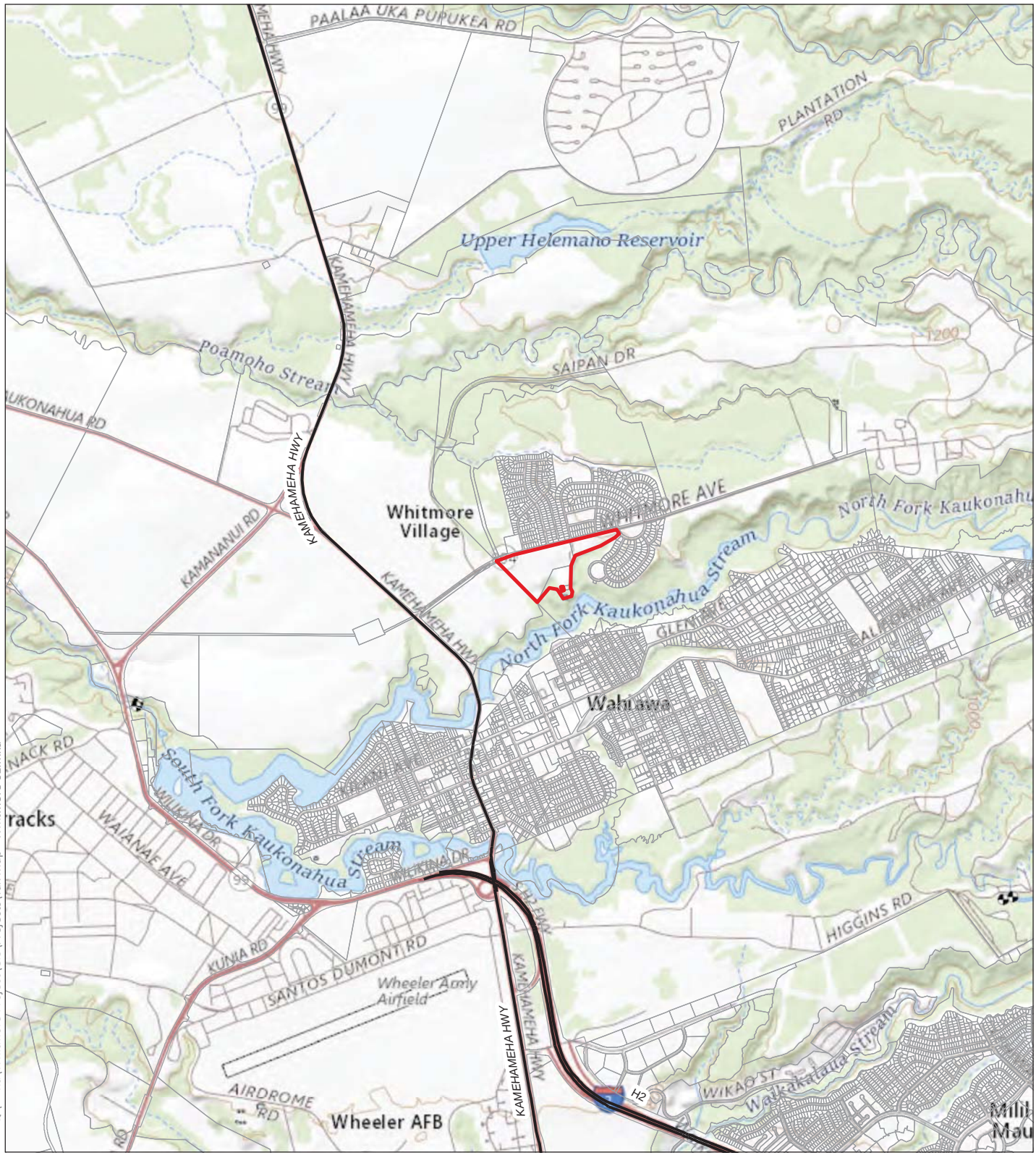
2 PROJECT DESCRIPTION

2.1 BACKGROUND AND NEED FOR THE PROJECT

During the pre-Assessment consultation process, State Representative District 46, Lei Learmont raised several questions and concerns regarding the farming industry within the area of the proposed project. As a background, the following information is provided. With the decline of the sugar and pineapple industries on O'ahu, the agricultural industry was left stagnated. The Galbraith Estate, which encompassed 1,723 acres north of downtown Wahiawā, was one such impacted property. In 2004, their lessee Del Monte harvested their last crop on the estate and subsequently the estate dissolved in 2007. Local residents lost jobs, active farmlands became fallow and the local economy suffered as a result. To address this issue and to prevent potential residential development of agricultural lands, the State of Hawai'i Department of Agriculture, Agribusiness Development Corporation (ADC) acquired approximately 1,207 acres of the estate in 2008. The land was then proposed to be leased to small farms at 50 to 100 acre parcels to support diversified agricultural production. To date, 600 of the 1,207 acres are leased to farmers, however, not all of the leased land is currently productive. Those who have leased lands are paying lease rent, and are charged for water usage. No other utilities (such as municipal wastewater collection and treatment or electricity) are provided to the lessees.

To further support diversified agricultural production in Wahiawā, the ADC acquired a 24 acre parcel from Castle and Cook in 2013 and a 257 acre parcel in 2015 to establish an ag-tech park. The ag-tech park was conceptualized as a way to modernize existing processing facilities in order to accommodate future farmers on the Galbraith lands. The final concept resulted in the proposal of the Whitmore Community Food Hub; a 34 acre project area which includes the former Dole Company Operation Facility and is currently occupied by the Whitmore Agricultural Tech Park. Project benefits include long-term lease options to farmers, decreased cost and time of transportation and shipping due to the central location near the H-2 freeway and adjacent farmlands, conversion of arable land to active land and achieving scale and diversity of food products, provision of co-op opportunities to leverage the high cost of equipment and supplies, provision of agricultural workforce housing, and engagement in public-private partnerships.

Farmers will be charged to have their products processed and put in cold storage, but obviously, at a lower cost than farmers can build and properly operate individual processing and cold storage facilities. The food hub will also serve food wholesalers, who are mostly located in Honolulu. Typically, these businesses make deliveries around the island, and as they head back to their businesses it will be convenient for some delivery routes to include a stop at the Food Hub to pick up produce (for further processing and packaging by individual food wholesalers).



PDF: Q:\Oahu\Whitmore Project\PDF\Figures
Path: Q:\Oahu\Whitmore Project\GIS\Projects\Tax Map - Whitmore 01.mxd

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

DATE: 12/4/2018

LEGEND

- Project Scope
- Tax Map Key Parcels
- Major Roadways



Source: ESRI. United States Geological Survey, 2017. City and County of Honolulu, 2017.

Figure 1 :
Regional Location

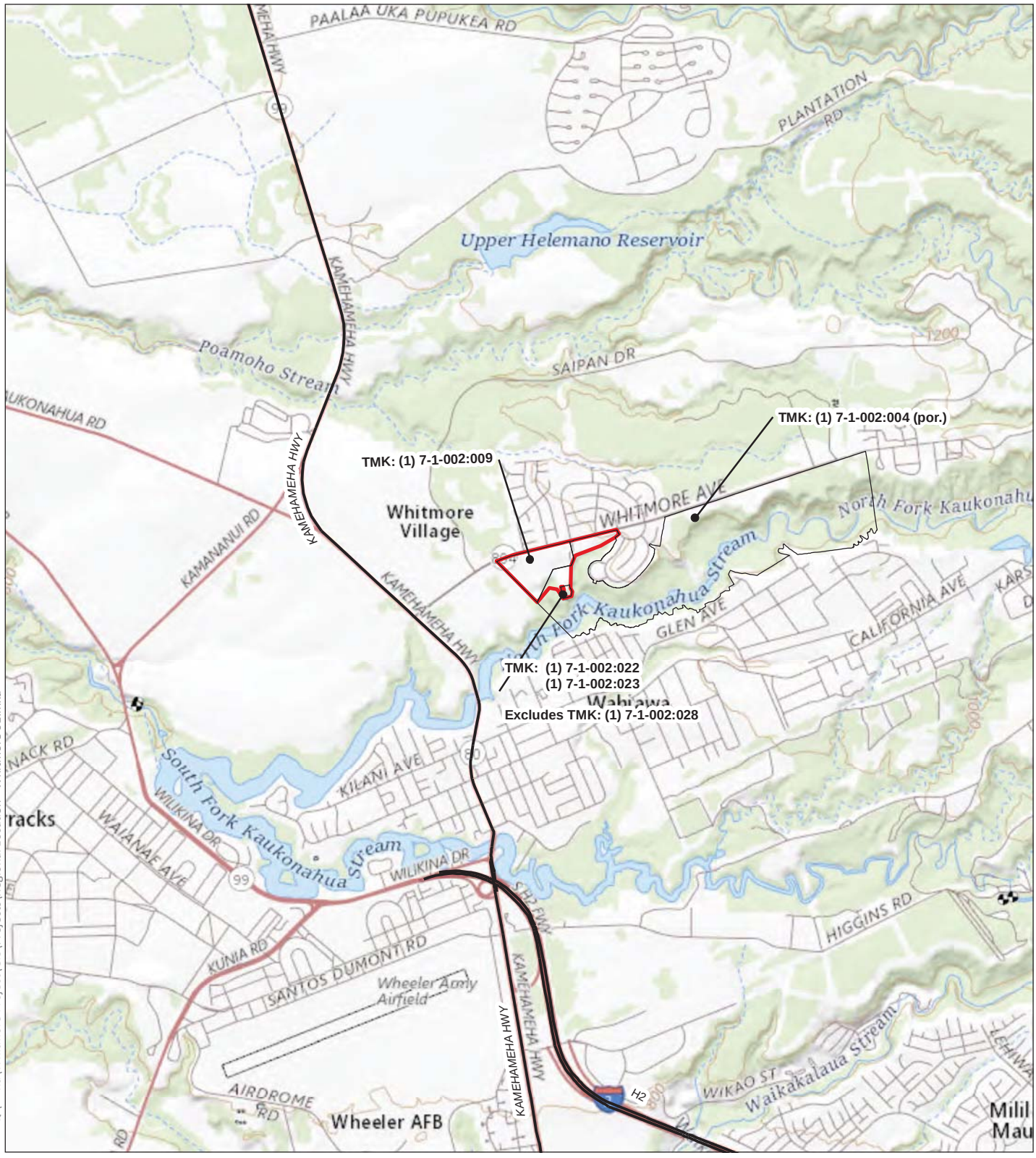
WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation — O'ahu

North — Linear Scale (feet)

0 750 1,500 3,000

PBR HAWAII & ASSOCIATES, INC.



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

DATE: 12/4/2018

LEGEND

- Project Scope
- Impacted Parcels
- Major Roadways



Source: ESRI. United States Geological Survey, 2017. City and County of Honolulu, 2017.

Figure 2:
Tax Map Key

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation — O'ahu

North

Linear Scale (feet)

0 750 1,500 3,000

PBR HAWAII & ASSOCIATES, INC.



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DATE: 12/3/2018

LEGEND

Project Scope



Source: ESRI. United States Geological Survey, 2017. City and County of Honolulu, 2017.

Figure 3 :
Aerial Map

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation — O'ahu

North

Linear Scale (feet)

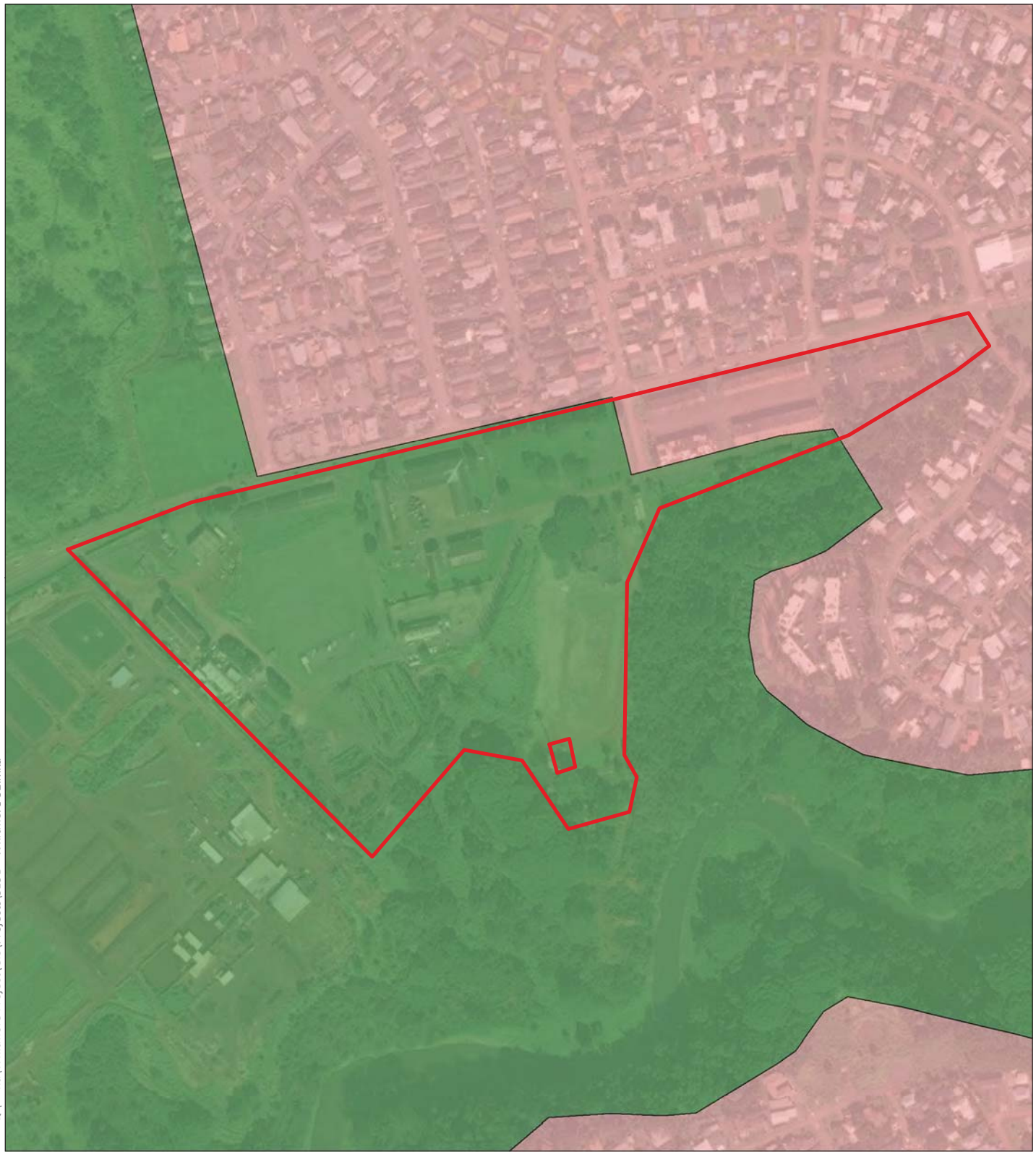
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2.1.1 Existing and Surrounding Land Use

Current land use designations for the proposed project area are:

- State Land Use: Agricultural and Urban Districts (Figure 4)
- County Zoning: Ag-1 Restricted Agricultural District
- Central Oʻahu Sustainable Communities Plan: Ag and Preservation Area (Figure 5)
- Special Management Area (SMA): Outside of SMA
- Federal Emergency Management Agency Flood Insurance Rate Map: Zone D (Figure 11)



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DATE: 12/4/2018

LEGEND

- Project Scope

State Land Use

- Agricultural
- Conservation
- Rural
- Urban



Source: ESRI. United States Geological Survey, 2017. City and County of Honolulu, 2017.

Figure 4 :
State Land Use Districts

WHITMORE COMMUNITY FOOD HUB COMPLEX

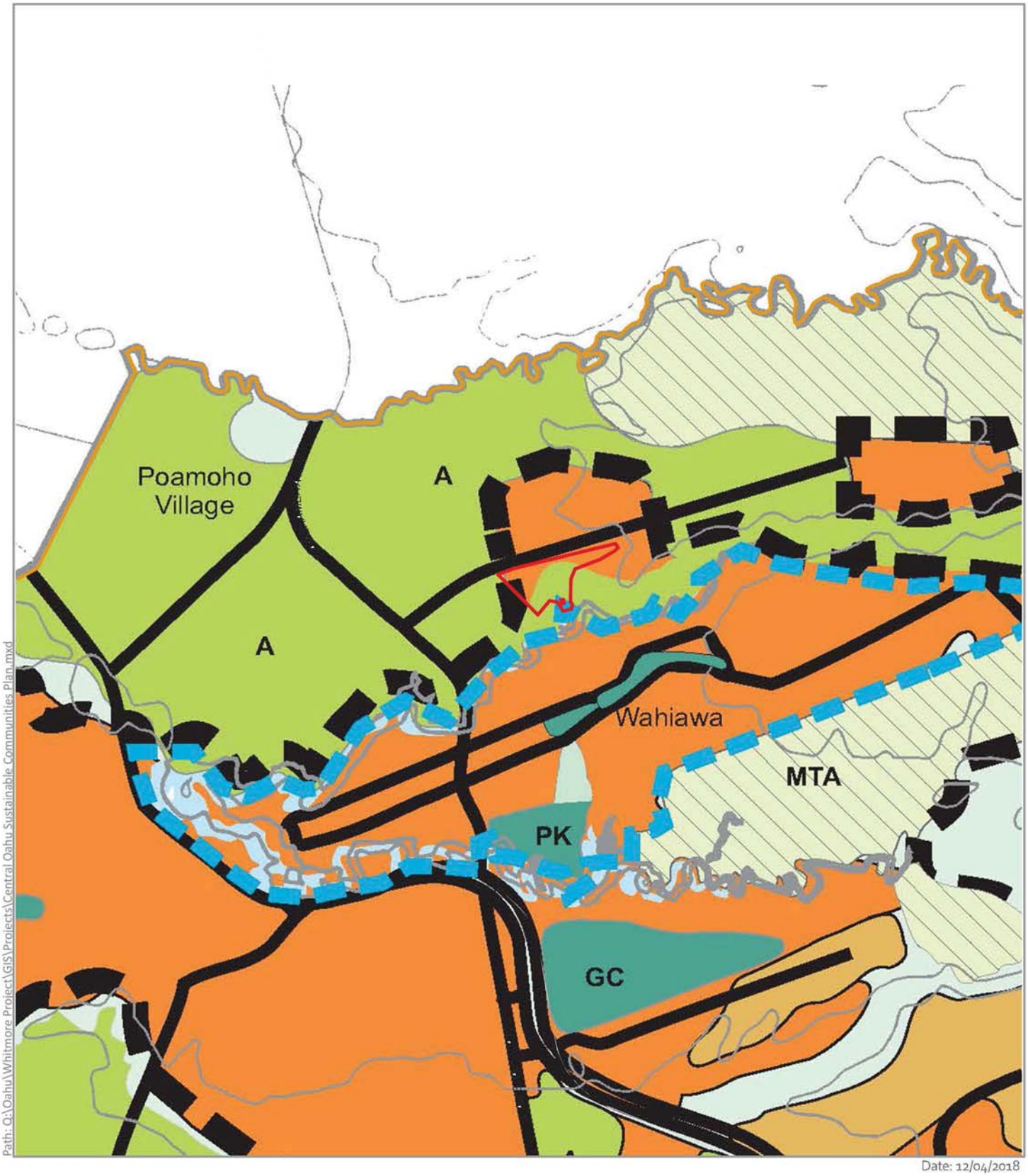
Agribusiness Development Corporation — O'ahu

North

Linear Scale (feet)

0 100 200 400

PBR HAWAII & ASSOCIATES, INC.



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

Date: 12/04/2018

LEGEND

- Preservation Areas
- Agriculture Areas
- Existing Urban Areas
- Urban Expansion Areas
- Special Areas
- Military Training Areas
- Urban Community Boundary
- Wetland

EXISTING	FUTURE	
		Highways, Arterial & Major Collector Streets
		Transit Corridor
		Transit Node
GC	GC	Golf Courses
PK	PK	Parks

- Project Scope
- Central Oahu Sustainable Communities Plan Boundary

Source: ESRI. United States Geological Survey, 2017. City and County of Honolulu, 2017.

Figure 5 :
Central Oahu Sustainable Communities Plan

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation — O'ahu

North

Linear Scale (feet)

0 750 1,500 3,000

PBR HAWAII & ASSOCIATES, INC

2.1.2 Objectives of the Action

The Whitmore Community Food Hub project aims to revitalize agricultural production in Central O'ahu, once a region that led the industry with pineapple and other crops. Doing so will help boost the economy, support current small scale farmers, and promote agricultural production as a viable and revenue generating career opportunity. The objectives of the proposed project are threefold: First, it is the objective of the proposed project to demonstrate that farming is an attractive profession that can be revenue generating and can allow farmers the ability to live and work in Hawaii. Second, the proposed project aims to create synergy and scale by providing a food processing facility that results in reducing the overall costs of farming and ensures supportive systems and activities become efficient. And third, the project aims to develop a comprehensive, economically sustainable facility for farmers that supports several stages of agricultural production including farms, packing and processing facilities, distribution systems, infrastructure and water, public-private partnerships and long-term investments.

In addition, per State law, ADC and/or any private partner would build the Proposed Project to the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) "Silver" rating or equivalent.

2.1.3 Key Elements of the Proposed Project

The food hub development will center on a large post-harvest processing facility and will include a "Research & Innovation Node", a new R-1 wastewater treatment system or additional wastewater gravity line connection, water storage infrastructure, and possibly agricultural workforce rental housing. The project will integrate all aspects of the development in phases.

The project began with an assessment of the existing structures within the project site. The current asset inventory includes eight warehouses and light metal frame buildings, two Quonset huts, two nursery greenhouses, three shade houses, one masonry building, concrete storage tanks, and two wooden-framed structures, all constructed 60 years ago. The appraisers concluded that while many of the structures have significant maintenance issues, all are functional. One existing outdoor shed, the machine shop, and an existing in-ground concrete tank will be retained.

The Agribusiness Development Corporation has received Capital Improvement Project (CIP) funds to construct a number of research pathology/ quarantine greenhouses at several locations across the state, including on the project site. The planned greenhouse on the project site may be used by pathologists, entomologists, breeders, and horticulturalists for agricultural research and may also be used to identify energy, waste, and carbon reduction strategies. The research

greenhouse is scheduled to be funded in the 2019 fiscal year and construction is scheduled to be completed by July 2019.

Phase I is envisioned to include the construction of: a 22,360 square foot research facility including a research greenhouse and office space ("Research & Innovation Hub"), a 'pioneer investment' warehouse building(s) totaling 72,000 square feet, and a tenant food production facility and food producer totaling 60,000 square feet. The warehouse would be built on the western end of the property. The research greenhouse could be located near the eastern edge of the property. Due to wastewater infrastructure constraints, either a new gravity wastewater line connection to the Wahiawā WWTP or a new R-1 wastewater treatment system may be proposed on site at the location of the abandoned Whitmore WWTP. System designs will be in compliance with the Guidelines for the Treatment and Use of Recycled Water (DOH Wastewater Branch 2002). If an onsite wastewater solution is selected, the project also proposes to construct non-potable water storage tanks with at least 720,000 gallon total capacity for fire protection and irrigation uses. Phase I will also include 3,000 square feet of open space for a farmer's market.

Phase I has been designed to meet the science-based protocols of the Federal Food Safety Modernization Act (FSMA). The FSMA is a preemptive set of regulations that are designed to ensure that safety measures are implemented throughout the food system. The proposed food hub will help farmers achieve FSMA compliance and implement good agricultural practices by providing farmers with a processing facility that is constructed with minimal articulation and joinery to prevent water and pest intrusions, resists mold, mildew and bacterial growth, and will be resistant to the corrosive effects of salt. The facility will be built to be durable and easy to clean through power washing. The proposed facility design also meets FSMA compliance by providing the required space necessary to properly sort food product between incoming and outgoing streams with protected areas in between for washing/ sorting, and processing/ packaging. Visitor access to operations space will be limited. Since both food safety requirements and technology are ever-evolving, the site plan (Figure 6) was revised to show the locations of envisioned land uses and their general location.

At the completion of Phase I, it is anticipated that there will be 18 agricultural workforce employees, 3,000 visitors, and 8 retail workers.

In Phase II, there is adequate area on the project site for expanding the Food Hub. Depending on the needs of farmers, up to 288,000 square feet under roof can be added to the initial 72,000 warehouse space constructed during Phase I. The final build-out of a logistics yard surrounding the warehouse(s) will also be completed. Phase II may also include room for agricultural workforce rental housing (to be developed by others). As currently envisioned, the agricultural workforce rental housing concept would include up to 100 single occupancy dwelling units (around 250 to 300 square feet a unit) and parking for approximately 50 cars.

In addition, there are no longer plans to convert Whitmore Avenue into either a "shared street" or "pedestrian mall."

At the completion of Phase II, it is anticipated that there will be 30 agricultural workforce employees, 6,000 visitors, and 14 retail workers. After full implementation of the proposed project, estimated to be by the end of 2028, it is expected that the complex will support 72 employees and 12,000 visitors.

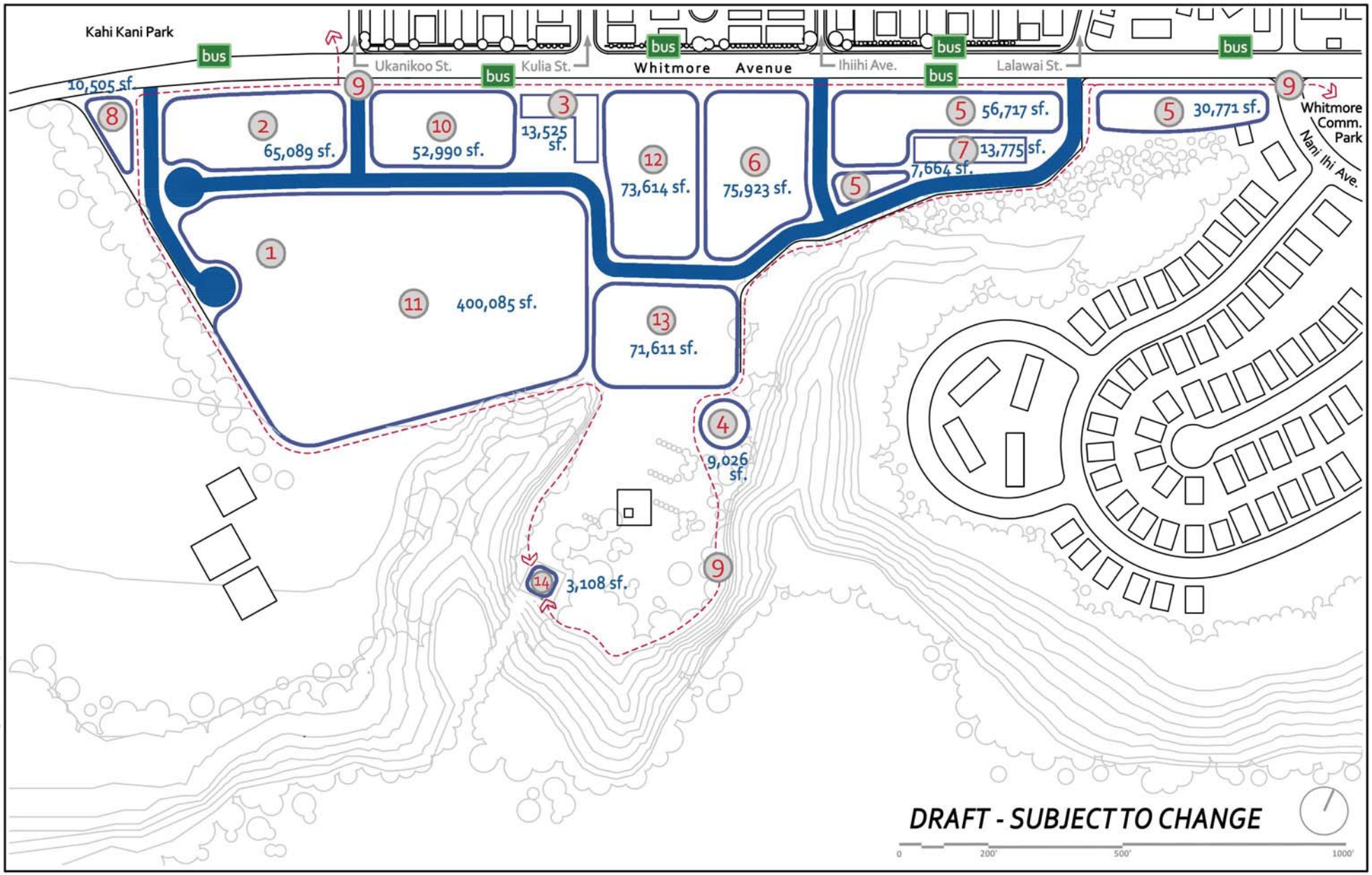
After construction of Phase I of the project, the ADC will pursue a public-private partnership to manage the food hub. The role of the agricultural operators will be to manage the day to day operations in coordination with ADC.

During the pre-Assessment consultation process, the Department of Agriculture wrote:

> *"The Department of Agriculture supports the concept of food hubs to the extent that it offers agricultural operations the opportunity to sell their products at price points that appropriately reflect the demand for locally grown fresh products that will be compliant with both the Food Safety Modernization Act (FSMA) and the voluntary but tougher Good Agricultural Practices (GAP) certification required by certain buyers. Successful establishment and growth of the Whitmore Community Food Hub as envisioned can help to strengthen agricultural production on former sugar and pineapple plantation lands on Oahu."*

2.1.4 Project Cost and Implementation Timeframe

Construction is expected to commence once plans and permit applications are approved. The project cost and construction timeline for the Whitmore Community Food Hub is currently undetermined.



DRAFT 11/09/2018

Whitmore Food Hub Conceptual Master Plan

1. Food Hub and Warehouse
2. Farmer's Market / Visitor Parking
3. Existing Machine Shop - Renovated
4. Water Storage Tanks and Treatment Ponds
5. Research and Innovation Node
6. Anchor Tenant Food Processing
7. Existing Outdoor Shed - Renovated
8. Whitmore Food Hub Entry Feature
9. Separate Pedestrian and Bicycle Path & Painted Crosswalks
10. Food Hub Visitor Center
11. Logistics Yard
12. Tenant Food Producer
13. Workforce Housing / Parking
14. Kaukonahua Stream Overlook

Figure 6:
Whitmore Community Food Hub Plan

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation O'ahu

North

PBR HAWAII & ASSOCIATES, INC.

Source: The University of Arkansas Community Design Center, University of Arkansas Office for Sustainability, University of Arkansas Resiliency Center, 2017. Agribusiness Development Corporation, 2017.
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3 DESCRIPTION OF THE NATURAL ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

3.1 CLIMATE

Existing Conditions

Wahiawā is situated on the central plain of Oʻahu. According to *The Rainfall Atlas of Hawaiʻi*, the site receives an average annual rainfall of approximately 59.70 inches (Giambelluca, et al., 2013). Seasonal variation in rainfall occurs with higher levels of rainfall during the months of November through May. Temperatures are typically mild and uniform, with the monthly average daily temperatures in Wahiawā around 82 degrees Fahrenheit. Humidity in the area averages between 65 to 80 percent, with higher humidity levels occurring during the winter months.

Potential Impacts and Mitigation Measures

The proposed project includes the construction of a number of buildings and public amenities, however, the building footprint is not expected to have a significant impact on the region's climate. No mitigation measures are warranted or planned at this time.

3.2 TOPOGRAPHY

Existing Conditions

Two volcanoes and the subsequent mountain ranges, the Waiʻanae mountain range to the west and the Koʻolau mountain range to the east, formed the distinctive shape of the island of Oʻahu. In between the two ranges sits the flat colluvium plain of central Oʻahu which resulted when eroded soils from the Koʻolau and Waiʻanae ranges accumulated and overlapped at the base of the steep slopes. (U.S. Department of Agriculture Soil Conservation Service, 1972). The project site is located on the Oʻahu central plain, on what is known as the Schofield Plateau. Elevations across the proposed project site slope from east to west. At the highest point, the site is approximately 1,010 feet above mean sea level (AMSL) at the eastern corner of the property adjacent to the Whitmore Neighborhood Park. At the site's most western edge, adjacent to the Aliʻi Agricultural Farm, the elevation is approximately 930 feet AMSL. The ground surface consists of existing vegetation, buildings and pavement.

Potential Impacts and Mitigation Measures

The proposed project will be constructed on an already developed site which is relatively evenly-sloped. However, grading is anticipated and will follow Best Management Practices (BMP) as prescribed in the Nationwide Pollution Discharge Elimination System (NPDES) Permit. The contractor will submit a site specific construction BMP Plan to the State of Hawai'i Department of Health before grading commences.

3.3 SOILS

Existing Conditions

3.3.1 Natural Resources Conservation Service (NRCS)

According to the U.S. Department of Agriculture, Natural Resources Conservation Service (U.S. Department of Agriculture Soil Conservation Service, 1972), the soils within the project area include Wahiawā silty clay (WaA), Kolekole silty clay loam (KuD and KuB), Leilehua silty clay (LeB), and Helemano silty clay (HLMG) (Figure 7: Soil Survey). Each of the aforementioned soil series originate from side-slope and interfluve landforms. The soils are well draining with runoff classes ranging from low to high and slopes ranging from 0-3%, 12-25%, 2-6% and 30-90% respectively.

3.3.2 Land Study Bureau Detailed Land Classification

The University of Hawaii Land Study Bureau prepared an inventory and evaluation of the State's land resources and classified those lands by agricultural productivity ratings. Letters indicate class of productivity with A representing the highest class and E the lowest. The northern portions of the Whitmore site have not been evaluated for agricultural productivity as the area has already been developed and is no longer considered for agricultural uses. The southern portion of the site remains undeveloped and thus has productivity ratings of good (B), fair (C), and very poor (E). HRS Chapter 205-4.5 limits the number of permissible uses within the State agricultural district based on the land study bureau's detailed land classification productivity rating classes.

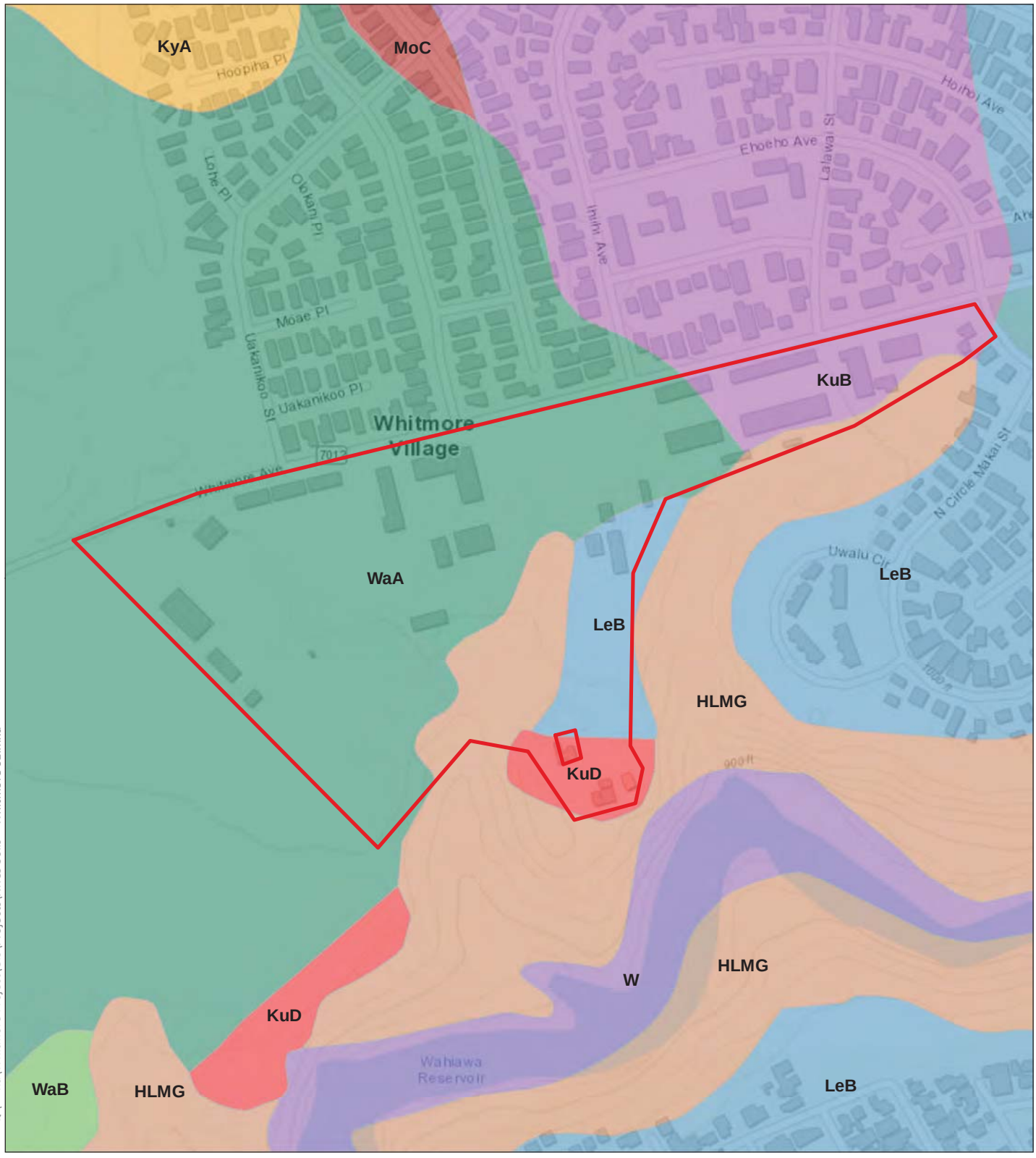
3.3.3 Agricultural Lands of Importance to the State of Hawaii (ALISH)

The Agricultural Lands of Importance to the State of Hawaii (ALISH) classifies soils as Prime, Unique or Other based on national standards. The site is classified as 'unique' farmland, indicating that the soil, geographic, and social characteristics of the site favor the production of a specific, specialized crop such as coffee, taro, rice, watercress or pineapple.

Potential Impacts and Mitigation Measures

The northern portion of the project site is currently developed and functions as an agricultural production facility. As such, the land has not been evaluated for crop cultivation under the LSB agricultural productivity rating system. However, for portions of the site evaluated by the LSB system, permissible uses that are applicable to the Whitmore Food Hub include (4) farm dwellings, employee housing, farm buildings or activities or uses related to farming and animal husbandry; (6) public and private open area types of recreational uses, including day camps, picnic grounds, parks and riding stables, but not including dragstrips, airports, drive-in theaters, golf courses, golf driving ranges, country clubs and overnight camps; and (10) buildings and uses, including mills, storage, and processing facilities, maintenance facilities, photovoltaic, biogas, and other small-scale renewable energy systems producing energy solely for use in the agricultural activities of the fee or leasehold owner of the property.

Short term soil impacts may include the potential for erosion and fugitive dust during grading and construction. All construction activities will comply with the applicable federal, state, and county regulations and rules for erosion, sedimentation, and dust control. No long term impacts are anticipated.



DATE: 12/4/2018

LEGEND

- Project Scope

Soils

- Helemano silty clay (HLMG)
- Kolekole silty clay loam (KuB)
- Kolekole silty clay loam (KuD)
- Kunia silty clay (KyA)
- Leilehua silty clay (LeB)
- Manana silty clay loam (MoC)
- Wahiawa silty clay (WaA)
- Wahiawa silty clay (WaB)
- Water (W) > 40 acres

Figure 7 :
NRCS Soil Survey

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation — O'ahu

North

Linear Scale (feet)

0 100 200 400

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Source: ESRI, United States Geological Survey, 2017, United States Department of Agriculture, Natural Resources Conservation Service.



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DATE: 12/6/2018

LEGEND

- Project Scope

LSB Land Classification

- B - Good
- C - Fair
- E - Very Poor
- Unrated

Figure 8 :
LSB Agricultural Productivity Rating

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation — O'ahu

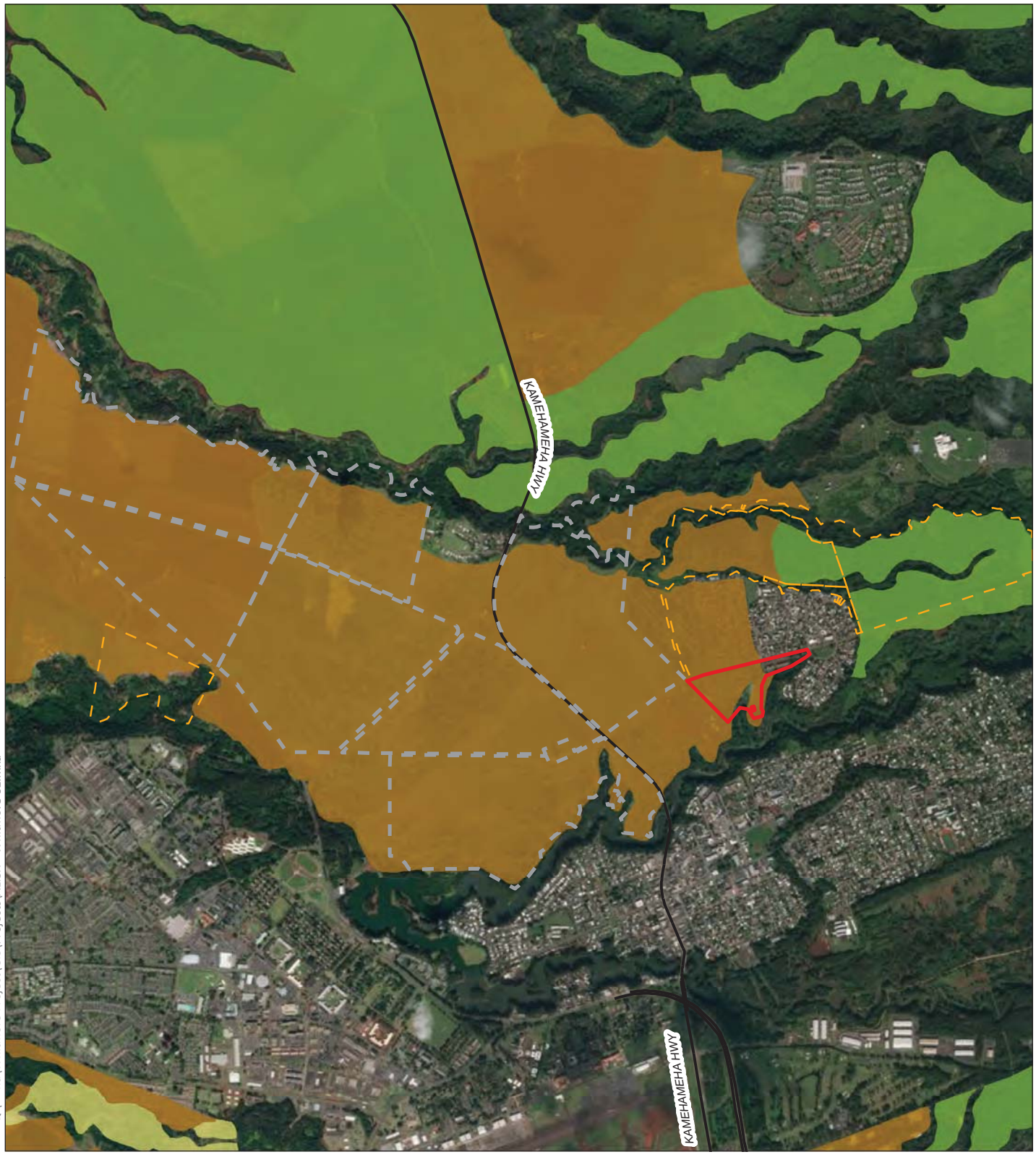
North

Linear Scale (feet)

0 200 400 800

PBR HAWAII & ASSOCIATES, INC.

Source: ESRI. United States Geological Survey, 2017. City and County of Honolulu, 2017.



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Source: ESRI, United States Geological Survey, 2017,United States Department of Agriculture, Natural Resources Conservation Service.

DATE: 12/6/2018

LEGEND

- Project Scope
- Galbraith Estate Acquisition
- Post Galbraith Acquisitions

ALISH

- Prime ALISH
- Unique ALISH
- Other ALISH
- Unclassified

Figure 9 :
Agricultural Lands of Importance to the State of Hawaii

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation — O'ahu

North

Linear Scale (feet)
0 750 1,500 3,000

PBR HAWAII & ASSOCIATES, INC.

3.4 WATERS AND WETLANDS

The Whitmore Community Food Hub project site is located within the Central Oahu Watershed, Schofield High Level water body, Wahiawā aquifer. The Central Oahu Watershed is a freshwater lens system where water recharge is from infiltration of rainwater and discharge from up gradient groundwater bodies (Honolulu Board of Water Supply, 2007). Dike confined water from the Koʻolau and Waiʻanae ranges also contribute to the Wahiawā aquifer. In the upper central plain, a significant portion of water recharge and water demand came from agricultural production. As sugar production decreased so did irrigation water demand and recharge rates in the region (ibid).

3.4.1 Surface Water

Existing Conditions

A number of small perennial and non-perennial streams run from the Waianae and Ko'olau mountain ranges to the central Oʻahu plains. Behind (and below) the project location sits the North Fork Kaukonahua Stream, also known as the Wahiawā Reservoir or Lake Wilson. The elevation of the stream south of the site is approximately 845 feet AMSL, which significantly lower that the elevation of the project site. Identified as a lake in the National Wetlands Inventory (Figure 10), it encompasses 228.3 acres across Wahiawā. The State of Hawaii Department of Health classifies Lake Wilson as Class 2 waters, indicating that the lake is protected for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies and shipping or navigation. In addition to Lake Wilson, there are a number of riverines less than 1.2 miles north of the project site. These include Helemano Stream, Poamoho Stream and Helemano Reservoir.

Potential Impacts and Mitigation Measures

The Whitmore Community Food Hub is not anticipated to have a significant adverse impact on surface water resources. None of the following are proposed: alterations to the bed and/or banks of a stream channel; stream diversion work; or new or expanded diversion(s) of surface water. During the pre-Assessment consultation process, the Department of Land and Natural Resources, Division of Aquatic Resources (DAR) commented:

> *"Erosion, runoff, and sedimentation can compromise the water quality in streams and ultimately the aquatic resources that inhabit these streams. The North fork of Kaukonahua Stream flows into the state managed Wahiawā Public Fishing Area, a highly utilized body of water that is patronized by freshwater anglers. With that being said, poor water quality can also reduce the fishing opportunities within the Wahiawā Public Fishing Area. Due to the threats mentioned above and the implications of these threats, DAR recommends that*

Best Management Practices (BMPs) be adhered to during the construction and operational phases of this project, in an effort to prevent erosion, runoff, and sedimentation and the synergistic detrimental impacts to water quality and aquatic resources in the North fork of Kaukonahua Stream and Wahiawā Public Fishing Area. BMPs should be detailed in engineering plans and explain how they are reducing events of erosion, runoff, and sedimentation into the adjacent waterways."

Therefore, during construction, best management practices for managing storm water and erosion control will be employed so as to avoid temporary inputs of sediment and pollutants into surface water resources. As stipulated in the Hawaii Administrative Rules HAR 11-54-3(2), no new treated sewage discharges are permitted and no new industrial discharges are permitted unless that discharge is covered by a NPDES general permit. Furthermore, to protect marine water quality, the Whitmore Community Food Hub will be designed and built in compliance with all applicable Federal, State, and City regulations pertaining to storm water management, including the DOH NPDES permit program. Where applicable, the Whitmore Community Food Hub will incorporate low impact development strategies into the design of the project. Post development discharge will be mitigated by the construction of a number of proposed retention basins on site. For more information on the drainage system, see Section 4.6.4 (Drainage) of this EA.

3.4.2 Groundwater

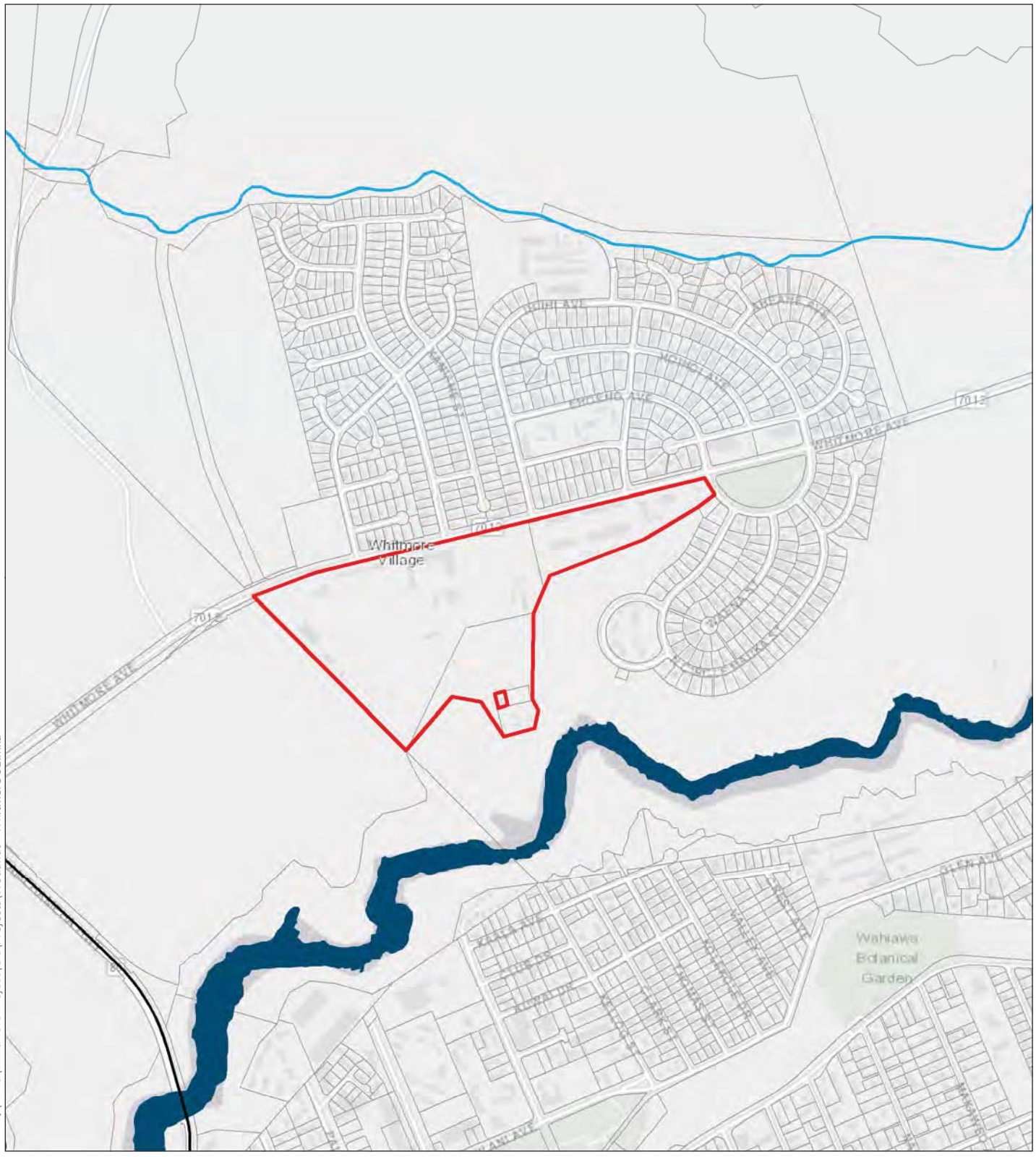
Existing Conditions

Groundwater provides all of the municipal, military and diversified agricultural uses in Central Oahu (Honolulu Board of Water Supply, 2007). Due to the unconfined, thin-bedded basalt aquifers in central Oahu, the depth to water table is commonly within a few hundred feet of ground surface (ibid). Central Oahu also encompasses the entire Oahu Sole Source Aquifer, an EPA designation under the Safe Drinking Water Act which was created to prevent the contamination of groundwater from federally funded projects. While not administratively applicable to the proposed project, the sole source aquifer designation does identify critical aquifers that supply more than 50% of a community's drinking water. As such, pollution monitoring and prevention is critical.

Potential Impacts and Mitigation Measures

The Whitmore Community Food Hub is not anticipated to have a significant adverse impact on groundwater quality, as the proposed project will not involve intensive agricultural production onsite. No other long-term uses that could contaminate groundwater are expected to be developed as part of the proposed project.

The Whitmore Community Food Hub will rely upon potable water furnished by the City and County of Honolulu Board of Water Supply. The BWS determines whether sufficient water is available for use without adversely impacting the integrity of the aquifer. Additional considerations for adequate non-potable water supply may be proposed. For more information on the water system, see Section 4.6.2 (Water System) of this EA.



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Source: ESRI, United States Geological Survey, 2017, City and County of Honolulu, 2017.

DATE: 12/4/2018

LEGEND

- Project Scope
- Tax Map Key Parcels
- Major Roadways

Wetlands

- Lake
- Riverine

Figure 10 :
Wetlands

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation — O'ahu

North

Linear Scale (feet)

0 200 400 800

PBR HAWAII & ASSOCIATES, INC.

3.5 NATURAL HAZARDS

Hawai'i is susceptible to potential natural hazards, such as flooding, tsunami inundation, hurricanes, and wildfires. This section provides an analysis of the site's vulnerability to such hazards.

The State of Hawai'i Emergency Management Agency (HI-EMA) operates a system of emergency sirens throughout the State to alert the public of emergencies and natural hazards, particularly tsunamis and hurricanes.

Impacts from natural hazards can be further mitigated by adherence to appropriate emergency measures as determined by HI-EMA and the City and County of Honolulu Department of Emergency Management. Emergency procedures will be developed for the Whitmore Community Food Hub, and staff will be trained in these procedures as a part of on-going building operations. The following section discusses the various natural hazards individually.

3.5.1 Flood

Existing Conditions

The Federal Emergency Management Agency (FEMA) publishes flood information in the form of Flood Insurance Rate Maps (FIRM) used by government and insurance agencies to determine the relative potential for damage during flood events. According to the FIRM, the entire site is located in Zone D (unevaluated areas where the flood hazard is currently undetermined). Flooding is possible but no mandatory insurance requirements apply. (Figure 11).

Potential Hazards and Mitigation Measures

During the pre-Assessment consultation period, comments submitted by the Department of Land and Natural Resources, Engineering Division states in part, "State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP." The Whitmore Community Food Hub is not anticipated to increase the site's exposure to flooding. Under the proposed development plan, the site is predicted to generate additional water runoff, however, proposed retention basins will contain the additional runoff and filter into the ground onsite. The proposed structures and site improvements will meet County code requirements to avoid adverse flood hazards to adjacent properties. See Section 4.6.4 (Drainage System) and Appendix F (Preliminary Engineering Report) for more information regarding drainage and drainage improvements.

3.5.2 Climate Change and Sea Level Rise

Potential impacts due to global climate change, including changes in precipitation, temperature, and storm frequency and intensity, could be especially taxing on the limited resources of island ecosystems. In addition, changing climate patterns, extreme weather events, and sea level rise can affect the climate patterns, magnitude of wind, flood, and rain impacts, and storm surges in coastal regions (UH Sea Grant, 2014). While sea level rise is often a primary concern for the coastal communities on O'ahu, changing climate patterns and extreme weather events could potentially affect farmers and farm production along the central plain. The greatest potential threats to the Wahiawā Community Food Hub include increased intensity of storms and hurricanes, flooding events, and damage to structures and vital infrastructure serving the property. Due to the location of the project area, sea level rise is not a consideration.

Potential Hazards and Mitigation Measures

While it cannot be known for certain how the area will be affected by climate change in the future, the proposed project has focused on sustainable design that takes flood frequency and disaster planning into consideration.

3.5.3 Tsunami

Existing Conditions

Since the early 1800's, approximately 50 tsunami have inundated the State of Hawai'i's shores, including the 1946 tsunami that resulted in wave heights of 11 meters and killed 6 people on Oahu alone. Additional tsunamis to impact Oahu shores occurred in 1952, 1957, 1960, 1964, and 2011 (Dunbar, 2018). According to the FEMA Flood Insurance Rate Maps, the site is not located within an area which would be impacted by coastal flooding from a tsunami (Figure 11). The closest regular and extreme tsunami evacuation zones begin at the Pearl Harbor Middle Loch close to the University of Hawai'i Leeward Community College. The Wahiawā Community Food Hub site is located approximately 9 miles from the shoreline in Pearl Harbor.

Potential Hazards and Mitigation Measures

The Wahiawā Community Food Hub will not exacerbate any tsunami hazard conditions. The site is located outside of the designated tsunami evacuation zone and is approximately 9 miles from the nearest shoreline.

3.5.4 Hurricanes and Tropical Storms

Existing Conditions

Records show that hurricanes and tropical storms have struck all major islands in the Hawaiian Island chain since the beginning of history. The first officially recognized hurricane in Hawaiian waters was Hurricane Hiki in August of 1950. Since 1982 three devastating hurricanes have impacted Hawai'i: Hurricane 'Iwa in 1982, Hurricane 'Iniki in 1992, and Hurricane Iselle in 2014. While it is difficult to predict these natural occurrences, it is reasonable to assume that future events could likely occur given the recent record.

Potential Impacts and Mitigation Measures

The proposed site is not anticipated to impact the site's vulnerability to hurricanes. In the event of a hurricane, the potential impact of destructive winds and torrential rainfall will be mitigated through compliance with the 2006 International Building Code for new construction. The project will coordinate with State and County agencies to prepare emergency plans and procedures.

3.5.5 Wildfires

From 2004 to 2014 there have been over 1,000 wildfires that have burned throughout the state of Hawaii, impacting over 17,000 acres each year (Trauernicht, 2014). Most fires have been caused by people and exacerbated by the introduction of nonnative, fire-prone grasses and shrubs (ibid). In 2017, 845 wild fires burned 7,697 acres across the state, 1,000 of which were on abandoned agricultural lands. Declining agricultural production increases fire risks to residential areas and natural resources (CTAR, 2018). In Wahiawā, the closest fire to the proposed project site occurred on July 3rd, 2003 and consumed approximately 0.5 acres (ibid). Four additional fires have been identified in close proximity to the project area including on the corner of Kamehameha Highway and Whitmore Avenue, all of which consumed anywhere between 0.5 and 1 acres (ibid).

Potential Impacts and Mitigation Measures

The proposed project is not anticipated to adversely affect the site's vulnerability to wildfires. Encouraging the productive use of the surrounding agricultural lands may positively impact the spread of wildfires as it will decrease the presence of fire-prone wild grasses and shrubs.



PDF: Q:\Oahu\Whitmore Project\PDF\Figures
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Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.
Source: ESRI, United States Geological Survey, 2017, FEMA FIRM Panel 15003C0120F and 15003C0140F, September 2004.

DATE: 12/4/2018

LEGEND

- Project Scope
- Major Roadways
- Base Flood Elevation (BFE) Line

Flood Hazard Areas

- D: Unstudied areas

Figure 11 :
Flood Insurance Rate Map

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation — O'ahu

North

Linear Scale (feet)
0 200 400 800

PBR HAWAII & ASSOCIATES, INC.

3.6 FLORA AND FAUNA

Existing Conditions

Many parcels within the Whitmore Village and Wahiawā communities, the subject parcels included, have been disturbed from its original natural conditions as agriculture became a dominant industry in the area. The project site was formerly the Dole Pineapple Company's operational baseyard and currently has several remaining structures on the property. A site survey was conducted by Mr. Robert Hobdy in September 2018 to assess the type, frequency, and rarity of plant, animal and bird species located within the project area (Appendix B). Consultation with the U.S. Fish and Wildlife Service (USFWS) was also conducted to assess possible threatened and endangered species on property.

Consultation with the U.S. Fish and Wildlife Service (USFWS) identified the Hawaiian hoary bat/ ʻōpeʻapeʻa (Lasiurus cinereus semotus), the Band-rumped storm-petrel/ ʻakēʻakē (Oceanodroma castro), the Hawaiian petrel/ ʻuaʻu (Pterodroma sandwichensis), and the Newell's shearwater/ ʻaʻo (Puffinus auricularis newelli) as species that may be within or traverse through the project area. However, the site survey conducted by Mr. Hobdy concluded that, while special attention and arrangements were made to try to observe the native Hawaiian hoary bat, no evidence of their presence was found on property. Additionally, the site survey concluded that the habitat of the project site is not suitable for native seabirds (Hobdy, 2018).

The site survey resulted in a total of 148 different plant species, 1 mammal, and 10 bird species observed within the project area. The only observed mammal on the project site was a domestic dog (Canis familiaris). Other mammals likely to frequent the area, but were not seen during the site survey include mice (Mus domesticus), rats (Rattus spp.), cats (Felis catus), and mongoose (Herpestes auropunctatus). Of the total flora observed, four were native plant species and all are common indigenous species in Hawaii. The four native plant species found on site included the Cyperus Polystachyos (no common name); hala (Pandanus tectorius); hau (Hibiscus tiliaceous) and ʻuhaloa (Waltheria indica). The one indigenous, migratory bird species found on the project site was the Kōlea, or Pacific golden-plover, (Pluvialis fulva). The Kōlea is a migratory bird that comes to Hawaii during the fall and winter months and are commonly found in Hawaii. None of the observed indigenous plant and bird species observed are on the Federal or State of Hawai'i Threatened and Endangered species list.

It has been noted, however, that the endangered ʻuaʻu and the threatened ʻaʻo may traverse the project area during dusk to access burrows in the mountains and again at dawn to head out to sea (Hobdy, 2018). Fledgling birds of these species may become disoriented by bright lights and become vulnerable to injury and predators.

Potential Impacts and Mitigation Measures

The Whitmore Community Food Hub is not anticipated to have a significant negative impact any Federal or State of Hawai'i listed Threatened, Endangered, or Candidate plant or animal species. No endangered or threatened plant species nor plant habitats were found during the survey. The habitat within the project area is not suitable for native O'ahu forest birds nor native seabirds (Hobdy, 2018). However, it has been recognized that the endangered Hawaiian petrel and the threatened Newell's shearwater may traverse the area during dawn and dusk. Artificial lights used when aiding construction activities may pose a risk to fledgling birds. As such, the project will implement the following mitigation measures to ensure that little to no impact to these species occurs during construction:

- Any significant outdoor lighting associated with the proposed project shall be hooded to direct the light downward.
- The project shall install automatic motion sensor switches and timer controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- The project shall avoid nighttime construction during the seabird fledging period, September 15 through December 15.

4 DESCRIPTION OF THE HUMAN ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section describes the existing conditions of the human environment, preliminary potential impacts of Whitmore Community Food Hub, and the preliminary mitigation measures to minimize any impacts.

4.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Existing Conditions

A historic properties inventory survey was conducted by ASM Affiliates, Inc. A report on the survey is included in its entirety in Appendix C and summarized below.

Background

The current study area is located within the traditional District of Waialua, which is one of six traditional *moku* or *kalana* (districts) that together make up the Island of O‘ahu. Consisting of fourteen distinct *ahupua‘a*, Waialua District encompasses a significant portion of the north shore and south/southeast portion of the Central O‘ahu Plain. Wide inland valleys make up the eastern portion of Waialua, which extend up the western flank of the Ko‘olau Mountain Range, while the western half of the *moku* comprises deep, V-shaped valleys along the eastern margin of the Wai‘anae Mountain Range.

According to the historic properties inventory survey (Appendix C):

> *Writing in The Hawaiian Planter, E.S. Craighill Handy describes agricultural terraces that were once located in the Wahiawā area, along the flatlands in the Poamoho and Kaukonahua Valleys in the vicinity of the study area. While Poamoho was “probably too narrow for taro terraces”, it was “likely that in these gulches, as at Waimea, sweet potatoes and bananas were planted around home sites along the ridge and near taro patches at the bottom of the gulch.” (Handy 1940:85). Handy also suggests that the Wahiawā area must have supported a “sizeable” Precontact Hawaiian population, based on the areas of lo‘i and the extensive sweet-potato and yam plantations (Handy & Handy 1972:465). It is within this general context that the following discussion of the history of the study area is framed...*
>
> *While the study area vicinity was an important region in the Precontact Period, being traditionally associated with royalty and recognized as the sacred birthplace of several important chiefs, during the Historic Period, a major transformation of the land occurred. Large-scale changes to the region included the harvesting of native Sandalwood forests*

for export and the destruction of traditional Hawaiian lifeways and the agricultural and domestic sites they would have encompassed.

Previous archaeological studies in the vicinity of the study area have demonstrated the apparent removal of historically-significant Precontact archaeological sites such as the Poamoho (SIHP Site 50-80-04-01605) and Hoolonopahu (SIHP Site 50-80-04-219) heiau, as the land-use practices of the region transitioned to commercial agriculture. While one study (Sims et al. 2011) identified a Precontact charcoal lens (SIHP Site 50-80-04-7173) during archaeological monitoring, archaeological test excavations in the vicinity of the current study area have documented significant ground disturbances that have taken place throughout the former pineapple fields, which would likely have destroyed or adversely affected intact subsurface historic properties across large expanses of the surrounding land.

Based on the above information, archaeological sites on the surface would have been destroyed by extensive commercial agricultural practices. As the Hawaiian populations were heavily-reduced following the arrival of foreigners in the early 19th Century, it is likely that any structural habitation features would have been abandoned and subsequently removed as the land was repurposed for maximizing the land for larger crop yields.

Fieldwork

During the archaeological field survey, the entire (100%) ground surface of the study area was visually inspected by field technicians walking transects, spaced no more than ten meters apart. No subsurface testing was conducted.

With respect to potential architectural resources, ASM conducted an intensive-level field survey on September 18 and 19, 2018, to document the property with photographs and extensive notes on the architectural elements, features, and materials of twenty-seven buildings and structures, as well as the setting and possible interrelationships among the functions of the property. Noted in the survey were alterations and additions, landscape elements, and the condition of the components of the buildings and structures.

According to the historic properties inventory survey (Appendix C): “As a result of the fieldwork for the current study, there were no archaeological sites encountered. Extensive modifications of the land within the study area was noted during the survey, including prior mass grading and the presence of underground utilities, building footprints, paved and unpaved roads and parking areas, and active agricultural plots. Twenty-seven buildings were identified, none of which are currently listed in either the National Register or the Hawai‘i Register of Historic Places, and none are currently recognized by the Historic Hawai‘i Foundation as historic properties. No previously

designated local, state, or national historic districts are located within the boundaries of the property. The majority of the buildings at the former Dole Company Operations Facility at Whitmore Village are utilitarian and served as machine shops, warehouses, storage, greenhouses, and other functions associated with a maintenance yard. Five buildings, located at the east end of the property, housed offices, meeting rooms, and clubhouses intended to serve the administrative, recreational, and research needs of employees and the company."

Potential Impacts and Mitigation Measures

As a result of the fieldwork for the current study, there were no archaeological sites encountered. Extensive modifications of the land within the study area was noted during the survey, including prior mass grading and the presence of underground utilities, building footprints, paved and unpaved roads and parking areas, and active agricultural plots. Twenty-seven buildings (twenty of which are older than fifty years) were identified, none of which are currently listed in either the National Register or the Hawai'i Register of Historic Places, and none are currently recognized by the Historic Hawai'i Foundation as historic properties. As a grouping, the buildings are pending the assignment of a State Inventory of Historic Places (SIHP) Site number 50-80-04-xxxx. Although none of the buildings are individually significant under any criteria, collectively, the site is considered significant under Criterion d for the information generated as a result of the current study. However, no further mitigation work is recommended by ASM, as the current study has sufficiently documented the site. There were no archaeological resources identified within the current study area, and it is ASM's conclusion that no further archaeological work needs to be conducted prior to, or during project implementation. In the unlikely event that significant archaeological resources are discovered during redevelopment activities, work in the area of the discovery would cease and DLNR-SHPD contacted pursuant to HAR §13-280-3. According to ASM, with respect to both archaeological and architectural resources, the effects determination for the proposed Whitmore Agricultural project is no historic properties affected.

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4.2 CULTURAL RESOURCES

A Cultural Impact Assessment was conducted by ASM Affiliates, Inc. (ASM). The complete report is included in Appendix D and summarized below.

Project Area Description

The project area is north of Wahiawā town and neighbors the Whitmore Village residential community. The proposed site is located on former pineapple plantation land and is currently used as an industrial facility that includes a warehouse, several administrative and maintenance buildings and other facilities in various stages of disrepair. The current lessees on the property include agricultural suppliers, a stone countertop factory and administrative offices for Dole Food Company. Traditionally the project site has been within the culturally significant ahupua'a of Waialua but is presently within the ahupua'a of Wahiawā. The project is within one mile of the sacred Kūkaniloko birthing stones; a site which gives strong cultural and historical significance to the area.

Historical Context

In 2018, ASM conducted a Historic Properties Inventory Survey (which included research on the Pre-contact Period, legendary accounts, and Historic Period), which coincides with the current project area. In sum, the project area vicinity was an important region in the Pre-contact Period, being traditionally associated with royalty and recognized as the sacred birthplace of several important chiefs. However, during the Historic Period a major transformation of the land occurred, which began with the large-scale harvesting of native Sandalwood forests for export; and continued with the development of the O. R. and L. railroad and the commercial cultivation of sugar and pineapple, as well as the development of United States military installations. These activities had a devastating and lasting impact not only on the landscape but also the local population and Hawaiian culture.

No archaeological sites were encountered as a result of the fieldwork. Extensive modifications of the land within the project area was noted during the survey, including prior mass grading and the presence of underground utilities, building footprints, paved and unpaved roads and parking areas, and active agricultural plots. ASM identified twenty-seven buildings, none of which are currently listed in either the National Register or the Hawai'i Register of Historic Places, and none are currently recognized by the Historic Hawai'i Foundation as historic properties. No previously designated local, state, or national historic districts are located within the boundaries of the property. Most of the buildings at the former Dole Company Operations Facility at Whitmore Village are utilitarian and served as machine shops, warehouses, storage, greenhouses, and other functions associated with a maintenance yard. Five buildings, located at the east end of the

property, housed offices, meeting rooms, and clubhouses intended to serve the administrative, recreational, and research needs of employees and the company. Collectively, the buildings will be assigned a State Inventory of Historic Places (SIHP) Site designation. As the Novell et al. (2019) study sufficiently documented the site, no further mitigation work was the recommended treatment. Furthermore, because there were no archaeological resources identified as a result of the fieldwork, Novell et al. (2019) concluded that no further archaeological work need be conducted prior to, or during project implementation.

These negative findings combined with the lack of information regarding traditional cultural practices specifically related to the subject parcel are not unexpected as the current project area was the site of the Dole Company Operations Facility at Whitmore Village since at least 1946; and prior to that was likely planted in pineapple as part of the Hawaiian Pineapple Company (HAPCo) acreage as far back as the early 1900s. Since around 1946, the project area has comprised garages, machine shops, warehouses, storage buildings, greenhouses, and a maintenance yard; in addition to offices, meeting rooms, and clubhouses intended, which served the administrative, recreational, and research needs of Dole and their employees and families. Currently, some of the buildings within the project area are being leased by independent companies; while the remainder of the buildings appear to be unused. Thus, any traditional cultural practices that may have been practiced within the current project area likely predated the establishment of HAPCo (later Dole) over a century ago.

Consultation

Gathering input from community members with genealogical ties and long-standing residency or relationships to the project area is vital to the process of assessing potential cultural impacts to resources, practices, and beliefs; for these individuals ascribe meaning and value to traditional resources and practices. Community members often possess traditional knowledge and a level of understanding that is unavailable elsewhere in the historical or cultural record of a place. As stated in the OEQC Guidelines for Assessing Cultural Impacts, the goal of the oral interview process is to identify potential cultural resources, practices, and beliefs associated with the affected project area.

As part of the CIA, ASM was able to secure interviews with Joe Francher, Thomas Lenchanko, and Winona Aguirre (Auntie Nona). Jo-Lin Lenchanko Kalimapau, Historian and Treasurer of the Hawaiian Civic Club of Wahiawā, facilitated the interview with Auntie Nona; and forwarded a request for information, prepared by and approved by ASM, to each of the Civic Club members (eighty in all) via email around January 23, 2019 (Appendix D).

In addition to these interactions, ASM received electronic correspondence from five individuals who likely received the information request when it was disseminated to the Hawaiian Civic Club

of Wahiawā. These individuals voiced their concerns about ASM's involvement in the CIA process as well as with the Proposed Project and asked that their letters be included verbatim in the CIA. To that end, their emails appear in their entirety in Appendix D.

Given the negative findings of the current study with respect to the identification of any traditional cultural practices or properties located within the boundaries of the subject property, due to the extensive land modification associated with over a century of commercial pineapple agriculture and the former Dole Company Operations Facility, it is the CIA's conclusion the redevelopment and continued use of the property will not result in any direct impacts to traditional cultural properties or associated practices.

However, as revealed in the consultation process, the project area location presents a prime example of the inherent challenge of defining the boundaries of traditional cultural properties. Although the focus of this assessment is meant to be narrowed to a 37-acre piece of property, which is the Project Site, some community members consulted in the preparation of the current document do not recognize the boundaries of the project area. Rather, they see the project area as *i loko* or within the 36,000-acre traditional cultural property *pu'uhonua* Kūkaniloko and the *kalana* of Wahiawā-Lihue-Helemano; and that any further division runs counter to their traditional Hawaiian belief system. Thus, the proposed redevelopment and continued use of the property will have an indirect impact to the broader traditional cultural property *pu'uhonua* Kūkaniloko, which holds cultural significance to those who believe in it and are actively engaged in the preservation of the traditional cultural properties and practices therein.

Therefore, the CIA recommended that the beliefs of the guardians of *Kukaniloko* and other Native Hawaiians be taken into account in an effort to allow the community that values the traditional cultural property to determine its significance. To that end, the CIA suggests that any future redevelopment projects incorporate a reference to the cultural significance of Wahiawā as the former birthplace of the Lo Ali'i and the home of the *pu'uhonua* Kūkaniloko. The CIA recommends that ADC collaborate with local community members, such as the members of the Hawaiian Civic Club of Wahiawā and cultural practitioners to determine the best approach to creating a culturally sensitive representation of the significance of the area that will honor the beliefs and traditional customs of the Native Hawaiian community of Wahiawā.

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4.3 VISUAL RESOURCES

Existing Conditions

Visual corridors are open areas that provide unobstructed views from distant vantage points. Wahiawā has views of the Waianae and Koʻolau Mountains and the upper Central Oʻahu plains from certain vantage points. The streetscape of Whitmore Avenue is a rural two-lane roadway with residential, agricultural and open land uses fronting the street. Visual landmarks and significant vistas identified in the Wahiawā Urban Design Plan and the Central Oʻahu Sustainable Communities Plan includes views of Lake Wilson from Kamehameha Highway at the H-2 Freeway off-ramp, Lake Wilson from Kamehameha Highway the Karsten Thot Bridge, the Waianae and Koʻolau Mountains from Kamehameha Highway and the view of the upper Central Oʻahu plains toward Waialua from the end of Koa Street in Wahiawā. The plan suggests limiting building heights outside of Waipahu and Wahiawā to low rise structures in order to protect panoramic views and the character of the built environment.

Potential Impacts and Mitigation Measures

During the pre-Assessment consultation period, State Representative District 46, Lei Learmont wrote: "The height of the proposed buildings, including for workforce housing, does not seem compatible with that of existing residential units. Should there be a height limitation of, for example, 3 to 4 stories for the proposed buildings?" There is currently no design for building the proposed workforce housing. ADC will not develop any affordable workforce housing on the site but may lease the property to HHFDC or a private developer to develop and operate such a product. The proposed Whitmore Community Food Hub project is not anticipated to impact current visual resources. Current views from the parcel will not be affected due to the proposed building structures. The Whitmore Community Food Hub complies with City and County of Honolulu Zoning building envelope restrictions and will consider the Wahiawā Urban Design Plan in the frontage design of the buildings. Visual impacts will be mitigated by attractive architectural design, adhering to setback standards, and by providing appropriate landscape planting to soften the parking lot and street frontage.

4.4 NOISE

Existing Conditions

Residents living closest to the proposed Whitmore Community Food Hub include those living on Whitmore Avenue, as well as those living on Nani Ihi Avenue, Circle Makai Street and Uwalu Circle. Existing background noise is produced primarily by traffic along Whitmore Avenue, but also wind through vegetation, human activity such lawn mowing and leaf blowing, etc.

Potential Impacts and Mitigation Measures

During construction of any given phase, there may be temporary noise impacts associated with the operation of heavy construction machinery, paving equipment, and material transport vehicles. Proper mitigation measures will be employed to minimize construction-related noise impacts and comply with all State noise control regulations. Increased noise activity due to construction will be limited to daytime hours and persist only during the construction periods. Noise from construction activities will be short-term and will comply with State Department of Health (DOH) noise regulations (Chapter 11-46, Community Noise Control, HAR). When construction noise exceeds, or is expected to exceed, the DOH's allowable limits, a permit must be obtained from the DOH. Specific permit restrictions for construction activities are:

- No permit shall allow any construction activities that emit noise in excess of the maximum permissible sound levels before 7:00 a.m. and after 6:00 p.m. of the same day, Monday through Friday;
- No permit shall allow any construction activities that emit noise in excess of the maximum permissible sound levels before 9:00 a.m. and after 6:00 p.m. on Saturday; and
- No permit shall allow any construction activities that would emit noise in excess of the maximum permissible sound levels on Sundays and holidays.

Night time construction is not currently anticipated, but if night time construction is performed, a noise variance will be required from the DOH. During operations, since most of the proposed uses will occur in buildings, the primary source of noise emission to the surrounding area is expected to be minimal, primarily from cars visiting the site.

During the pre-Assessment consultation period, State Representative District 46, Lei Learmont wrote: "How noisy will the processing plants be? Will there be noise caused by entertainment and other activities from the tourist mall? How will noise from both of these enterprises affect close neighbors?" It is anticipated that there will be some operational noise from the food processing activities. This can be mitigated by orienting the "Food Hub and Warehouse" (Figure 6) buildings to be parallel with Whitmore Avenue, thus shielding noise from the "Logistics Yard" (Figure 6). A "tourist mall" is no longer being proposed. In addition, ADC will require mechanical equipment (e.g., ventilation and air conditioning systems) to be enclosed such that noise levels do not exceed the maximum permissible noise levels listed in the Hawaii Administrative Rules.

4.5 AIR QUALITY

Existing Conditions

Air quality refers to the presence or absence of pollutants in the atmosphere. It is the combined result of the natural background and emissions from many pollution sources. The impact of land development activities on air quality in a proposed development's locale differs by project phase (site preparation, construction, occupancy) and project type. In general air quality on O'ahu is considered good. The relatively high air quality can also be attributed to the region's consistent exposure to wind, which quickly disperses concentrations of emissions.

The State of Hawai'i operates a statewide network of air quality monitoring stations, and the closest Department of Health (DOH) monitoring station to the Whitmore Community Food Hub site is located 10 miles southeast in Pearl City. Federal and State environmental health standards pertaining to outdoor air quality are typically met in the State due to prevalent trade winds and the lack of major stationary sources of pollutant emissions. Based on the air quality data provided by the DOH monitoring station website, the Pearl City station's air quality index averages under 50 (Good per EPA Air Quality Index), and air pollutant concentration is typically less than 16.0 µg/m3 (DOH, 2018).

Potential Impacts and Mitigation Measures

The Whitmore Community Food Hub is not anticipated to significantly impact local air quality. Construction activity will be the principal source of short-term air quality impact. Construction vehicle activity will temporarily increase automotive pollutant concentrations along Whitmore Avenue and on-site, but there are no residences immediately downwind. Site preparation, earth moving, and building construction will create particulate emissions during the short term. Movement of construction vehicles on unpaved surfaces can also generate particulate emissions.

Although the potential for fugitive dust is low due to the wetter climate and the distance from downwind residences, adequate dust control measures will be employed, particularly during construction during low-rainfall periods. Dust control will be accomplished by frequent watering of any unpaved roads within Whitmore Community Food Hub site and areas of exposed soil surfaces. As soon as feasible, landscaping of completed areas will also be employed. Dust control measures will comply with applicable provisions of HAR section 11-60.1-33. Measures to control dust during construction may include:

- Providing an adequate water source at the construction site prior to start-up construction activities;
- Irrigating the construction site during periods of drought or high winds and all dry conditions;

- Landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase;
- Disturbing only the areas of construction that are in the immediate zone of construction to limit the amount of time that the areas will be subject to erosion;
- Providing adequate dust control measures during weekends, after hours, and before daily start-up of construction activities; and
- Installing silt screening in the areas of disturbance.

4.6 INFRASTRUCTURE

4.6.1 Transportation System

During the pre-Assessment consultation process, the City and County of Honolulu (City) Department of Transportation Services (DTS) requested information that should be included in transportation impact assessment. Additionally, during the pre-Assessment consultation process, the City Department of Design and Construction (DDC) wrote that: "…Whitmore Community Park is next to the proposed development and may generate an increase in traffic for the surrounding area. The EA should include a traffic study to assess the impact on Whitmore Avenue and the adjoining areas." During the pre-Assessment consultation period, State Representative District 46, Lei Learmont also raised many questions about "roads and bridges." In response to State Representative Learmont's, DTS' and DDC's comments, Fehr and Peers prepared a Mobility Analysis Report (MAR) to evaluate the potential traffic, bicycle, and pedestrian impacts resulting from the creation of the Whitmore Community Food Hub. The MAR is included in its entirety in Appendix E of this EA and summarized in this section.

Existing Transportation Facilities

The key roadways in the vicinity of the Project Site are described below.

Whitmore Avenue (Route 804) is the primary local street that traverses an east-west direction and provides access to the project site. Whitmore Avenue is a two-lane minor collector from Kamehameha Highway to the NCTAMS PAC entrance. The posted speed limit is 25 miles per hour (mph). Whitmore Avenue is under the jurisdiction of HDOT. Congestion was not observed during field observations. Currently, access to the project site is provided on the south side of Whitmore Avenue at Ihiihi Avenue and Lalawai Street.

Bike Facilities: Bike lanes are not currently provided on Whitmore Avenue. Bicyclists share the roadway or ride in the limited roadway shoulders.

Pedestrian Facilities: Existing pedestrian facilities are limited. Sidewalks are provided along the north side of Whitmore Avenue from Kamehameha Highway to Uakaniko'o Street, providing a

pedestrian connection to the bus stops on Kamehameha Highway and at the Whitmore Avenue / Uakaniko'o Street intersection.

Striped crosswalks are provided at the following locations:

- Whitmore Avenue / Kamehameha Highway (north and east legs providing access across Kamehameha Highway and Whitmore Avenue).
- Whitmore Avenue / Saipan Drive (north leg providing access across Saipan Drive).
- Whitmore Avenue / Ihiihi Avenue (east leg providing access across Whitmore Avenue).
- Whitmore Avenue / Lalawai Street (north and west legs providing access across Lalawai and Whitmore Avenue).

Kamehameha Highway (Route 80) is the regional connector road within the vicinity of the project site. It is a two-lane principal arterial that extends across central Oahu beginning at the Nimitz Highway junction near Daniel K. Inouye International Airport, circles the island, and ultimately terminates at Pali/Kalanianaole Highway intersection in Kaneohe. The posted speed limit near Whitmore Avenue is 45 mph. Kamehameha Highway (including Kartsten Thot Bridge) is under the jurisdiction of HDOT. The intersection at Whitmore Avenue is controlled by a traffic signal with separated turn lanes. Congestion was not observed during field observations. Bike Facilities: Bike lanes are not provided on Kamehameha Highway. Bicyclists ride in the shoulder on either side of the road.

Pedestrian Facilities: Existing pedestrian facilities are limited. A sidewalk is provided on the east side of Kamehameha Highway north of Whitmore Avenue to serve the existing bus stop. Crosswalks and pedestrian countdown signals are provided on the east and north legs of the intersection at Whitmore Avenue. No other pedestrian facilities are provided between Whitmore and surrounding areas.

Saipan Drive is a north-south traversing roadway between Kamehameha Highway and Uakaniko'o Street that connects northerly from Whitmore Avenue. It provides a connection from Whitmore Avenue to a NSA facility and the Naval Computer and Telecommunications Area Master Station Pacific (NCTAMS). The posted speed limit of Saipan Drive is 35 mph. Saipan Drive is under the jurisdiction of CCH. The intersection at Whitmore Avenue is side-street stop controlled on Saipan Drive.

Bike Facilities: Bike lanes are not provided on Saipan Drive

Pedestrian Facilities: Pedestrian facilities are not provided on Saipan Drive. A crosswalk is provided across Saipan Drive at Whitmore Avenue to provide a pedestrian connection between Whitmore Village and Kamehameha Highway.

Existing Transit Facilities and Services

During the pre-Assessment consultation period, the State Office of Planning wrote: "We also recommend the Draft EA include…Access to public transportation, goods, and services for occupants of the proposed agricultural worker housing." TheBus is the main public transportation service on the Island of Oahu, where it served over 63 million riders in the fiscal year of 2017-2018. The bus fleet transports over 197,000 riders a week via fixed-route, express, and paratransit service. Route 72 is the regular service bus route which passes by the project site along Whitmore Avenue. In the westbound direction, Route 72 starts at the Schofield barracks and travels through Wahiawā, along Whitmore Avenue where it passes immediately adjacent to the project site and terminates at Whitmore Avenue and Nani Ihi Avenue. In the eastbound direction, the Route starts at Whitmore Avenue and Nani Ihi Avenue and terminates at Macomb Road and Wilikina Drive. Route 72 provides connections to Routes 52, 83, and 88A along Kamehameha Highway – less than one mile from the project site.

Routes 52, 83, and 88A connect with Route 72 and provide service from Kamehameha Highway to the following major destinations:

- **Route 52** – provides service to the North Shore, Downtown Honolulu, and the Dole Plantation.
- **Route 83** – provides service to the North Shore, the Dole Plantation, Downtown Honolulu and the University of Hawaii. Traveling along the H2 freeway for much of its route, Route 83 provides an express connection to downtown Honolulu.

Route 88A – provides peak hour loop service from the North Shore east along the Kamehameha Highway and Kahekili Highway to Downtown Honolulu and continues northwest to the project site, the Dole Plantation and the North Shore.

Existing Bicycle Activity

Based on peak period counts conducted, four (4) bicyclists were observed on Whitmore Avenue during the AM (morning) peak hour. During the PM (afternoon) peak hour, one (1) bicyclist was observed on Kamehameha Highway turning onto Whitmore Avenue and seven (7) bicyclists were observed on Whitmore Avenue.

Existing Pedestrian Activity

Pedestrian counts collected during the peak periods showed that the highest volumes of pedestrians crossing at a study intersection occurred during the AM peak hour with 21 people crossing at the Kamehameha Highway/Whitmore Avenue intersection at 7:00 AM. Most pedestrians were crossing Kamehameha Highway on the north side of the intersection (between the bus stop on the west side of Kamehameha Highway to the bus stop on the north side of Whitmore Avenue), to board Route 72.

Less pedestrian activity was observed along Whitmore Avenue, which included six (6) pedestrians during the AM peak hour and three (3) pedestrians during the PM peak hour at the study intersections along Whitmore Avenue. The transit ridership shown in Table 4 reflects moderate levels of pedestrians walking to and from the bus stops in Whitmore Village throughout the day.

Existing Traffic Volumes

Existing lane configurations and traffic signal controls were obtained through field observations. The operations of the existing intersections were evaluated during weekday AM and PM peak periods (6:00 AM – 9:00 AM and 3:30 PM – 6:30 PM). Traffic counts were collected during the weekday AM and PM peak periods at the study intersections in October 2018 under normal traffic and weather conditions. The weekday AM peak hour of traffic for the study area generally occurred between the hours of 7:00 AM to 8:00 AM. During the weekday afternoon, the PM peak hour of traffic generally occurred between the hours of 3:30 PM to 4:30 PM.

Figure 5 of Appendix E presents the existing AM and PM peak hour turning movement volumes, corresponding lane configurations, and traffic control devices.

Existing Intersection Levels of Service

Peak hour intersection Levels of Service (LOS) analysis was performed for the existing study intersections using the methodology described previously and traffic count data collected for this study. **Table 5** of Appendix E shows the results for Existing Conditions LOS. According to the MAR (Appendix E), all study intersections currently operate at LOS D or better during the AM and PM peak hours with the highest delay occurring at Whitmore Avenue/Saipan Drive in the AM peak hour. It should be noted that: 1) the volume experiencing this delay is ten vehicles in the AM peak hour and 15 vehicles in the PM peak hour, and 2) these vehicles have a refuge area to allow a two-stage turn onto eastbound Whitmore Avenue. Excessive delays were not observed by Fehr & Peers during their field visits to the site.

Potential Impacts and Mitigation Measures – During the pre-Assessment consultation period, the State Office of Planning wrote: "We also recommend the Draft EA include…Anticipated level of visitor trips and traffic generated the proposed visitor center and retail operations, and the potential impacts on surrounding neighborhoods as well as agricultural operations…"Also during the pre-Assessment consultation period, the Wahiawā-Whitmore Village Neighborhood Board 26 wrote:

> *"2. What is the expected traffic, pedestrian and visitor volume, and the impact to this village?*
>
> *3. What is the reason for a 'shared street' concept along Whitmore Ave?...*
>
> *4. Why is there a proposal for a bridge between Whitmore and Wahiawā?...*
>
> *5. Have our neighbors, the U.S. Navy and the U.S. Marines component located at NCTAMS in Whitmore been notified about this possible project?..."*

13. Does visitor parking mean tour busses and vans stopping on their way to the North Shore?"

It should be noted that the current Wahiawā Food Hub Complex plan (Figure 6) does not include the 'shared street' concept nor the 'Bridge to Wahiawā' proposal. Traffic will remain on current public roadways, including Whitmore Avenue. All vehicle trips will arrive to the site via Whitmore Avenue. As previously noted, current access to the project site is provided on the south side of Whitmore Avenue at Ihiihi Avenue and Lalawai Street. Redevelopment of the site will include two additional driveways at Uakanik'oo Street and across from Kahi Kani Park for a total of four driveways serving the project. The proposed project includes an internal roadway that will connect all driveways to accommodate on-site circulation. Each driveway is envisioned to serve specific land uses, as described below.

- **Driveway 1 (between Saipan and Uakaniko'o Street)** will provide access for trips related to the food hub, warehouse, and logistics yard, which includes truck and employee trips. This driveway dead ends at the southwestern corner of the site. Ample space for trucks to turn around and exit the site will be provided.
- **Driveway 2 (Whitmore Avenue/Uakaniko'o Street)** will provide direct access to parking for the Farmers Market and Food Hub Visitor Center. This driveway also provides access to the machine shop, food producer, and workforce housing.
- **Driveway 3 (Whitmore Avenue/Ihiihi Avenue)** will provide direct access to the food processing area, workforce housing, and the Research and Innovation Node (office).
- **Driveway 4 (Whitmore Avenue/Lalawai Street)** will provide direct access to the Research and Innovation Node (office).

The on-site roadway will be designed to meet all fire access and turnaround requirements.

Potential transportation and mobility impacts of the proposed project were evaluated following guidelines established by the State of Hawaii Department of Transportation – Highways Division (HDOT) and the City & County of Honolulu Department of Planning & Permitting (DPP) Traffic Review Branch (TRB). Traffic operations at study intersections were evaluated during the weekday morning (AM) and evening (PM) peak hours for Existing (2018), Baseline (2028) "Without Project," and Baseline (2028) "With Project" conditions based on existing roadway configurations. The Existing (2018) and Baseline (2028) Without Project conditions included the analysis of six existing study intersections. The Baseline (2028) With Project scenario included a seventh study intersection at Whitmore Village and the proposed driveway across from Kahi Kani Park.

At full buildout, the proposed project is forecast to generate a total of 2,578 net new daily vehicle trips, including 138 net new AM peak hour trips (104 inbound/34 outbound), and 239 net new PM peak hour trips (92 inbound/147 outbound).

Key findings of the mobility analysis are summarized below:

- The existing study intersections operate adequately based on current roadway conditions and traffic volumes.

- The Master Plan for the Whitmore Community Food Hub Complex envisions the site to be developed incrementally as demand arises. Based on the existing roadway conditions and lane configurations, the addition of project-related trips at full buildout is anticipated to increase delay to less than desirable levels at the following un-signalized study intersections:

    - Whitmore Avenue/Saipan Drive
    - Whitmore Avenue/Driveway 1 (across from Kahi Kani Park)
    - Whitmore Avenue/Uakaniko'o Street (Driveway 2)

  Potential improvements to lessen the impacts of the forecasted increase in delay are discussed in this report, such as modifications to the roadway or traffic control. Ultimately, no changes to current traffic control are recommended at Whitmore Avenue/Saipan Drive intersection and the Whitmore Avenue/Uakaniko'o Street (Driveway 2), as improving delay for the side streets would result in increasing delay along Whitmore Avenue.

  At the future intersection of Whitmore Avenue/Driveway 1 (across from Kahi Kani Park), the project shall install all-way stop control (AWSC) if required by HDOT. Driveway 1 is planned to provide access for project employees and truck trips. Therefore, it is also recommended that the project provide a separate eastbound right turn lane and a westbound refuge lane on Whitmore Avenue to accommodate the anticipated truck activity.

- The vision for the project includes placemaking elements and improved mobility in Wahiawā. The placemaking component includes integrating public spaces throughout the project site intended for residents, employees, and visitors to traverse the development by walking or biking. Externally, a new multi-use path is proposed along the entire length of the project frontage on the south side of Whitmore Avenue. This path will provide visitors and local residents with a separate facility to walk along the side of Whitmore Avenue that currently does not have a sidewalk and will connect to the existing network of sidewalks around the study area. In keeping with the semi-rural nature of Whitmore Village, a separated all-weather path is recommended to designate a visible pedestrian zone and reduce the potential for pedestrian crossings between intersections. A landscaped buffer is recommended between the multi-use path and travel lanes to provide a physical and visual barrier between vehicles and non-motorists.

- The existing striped crosswalks along Whitmore Avenue will provide sufficient connections between the north and south sides of the street. Measures to maximize visibility of pedestrians along and crossing Whitmore Avenue are recommended. An additional pedestrian connection across Whitmore Avenue is proposed from the project site to Kahi Kani Park, providing improved walkability in the community. Advanced

stop/yield lines are recommended at all stop-controlled approaches to enhance pedestrian safety.

- High visibility crosswalks are recommended across all project driveways to direct the flow of pedestrians and improve visibility of people walking. Additional pedestrian amenities such as wayfinding signage, shade, LED lighting, and enhanced visibility are recommended to promote walking to and within the project site.

- According to the MAR, existing transit operations are sufficient to serve the study area, which includes four service routes (52, 83, 88A, and 72) on Kamehameha Highway within walking distance from the project site. Route 72 provides direct access along Whitmore Avenue with 90-minute headways on weekdays and 75-minute headways on weekends. Modifications to transit stop locations are not recommended as a result of the development of the Whitmore Community Food Hub. The demand for local transit is anticipated to increase with development of the project site, which may require increased service to be provided in the future. In addition, bus stop amenities are recommended at the existing bus stops on Whitmore Avenue.

- Based on the lack of bicycle facilities and connections on Kamehameha Highway, growth in bicycle trips is not anticipated to be substantial enough to install separated bicycle facilities on Whitmore Avenue or on-site. Bicyclists will be able to access the site via the new site driveways and multi-use path. The new multi-use path is proposed along the project frontage on the south side of Whitmore Avenue that would be available for use by bicycles and pedestrians. The proposed multi-use path will serve as an adequate bicycle facility to serve the project. In addition, secure bike parking and supplemental amenities are encouraged to be provided on-site. This would include bike racks at several key locations to encourage the use of non-automobile travel, particularly for local neighborhood trips.

- Parking will be provided on-site for all proposed uses in conformance with City and County of Honolulu parking requirements. No parking will be required along Whitmore Avenue.

During the pre-Assessment consultation period, the City and County of Honolulu Department of Transportation Services wrote: “A TMP should be prepared for this project that is jointly reviewed and accepted by the Department of Transportation Services (DTS) and the Department of Planning and Permitting...The area Neighborhood Board, as well as the area businesses, emergency personnel (fire, ambulance and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc. should be kept appraised of the details of the proposed project and the impacts that the project may have on the adjoining local street area network.” A Traffic Management Plan (TMP) will be submitted with the first Building Permit application.

4.6.2 Water System

A preliminary engineering report (PER) was conducted by Sam O. Hirota, Inc. (SOH). The PER is included in its entirety in Appendix F and summarized below.

Existing Conditions

Potable water in Wahiawā and Whitmore Village is supplied by the City and County of Honolulu Board of Water Supply (BWS), which draws only from groundwater sources. There are currently 17 well sources and 14 reservoirs which holds approximately 18 million gallons of potable water servicing the central O'ahu region. Within Wahiawā, the BWS potable water infrastructure typically follows the major roadways including California Avenue, Kilani Avenue, Glen Avenue, Wilikina Drive and portions of Whitmore Avenue. An existing 12-inch water main is located on along Whitmore Avenue and adjacent to the west end of the project site. There are two fire hydrants currently onsite (FH #C395, the other is not identified). The fire hydrants nearest to the project are located along Whitmore Avenue and indicated as FH #CO3090 and #CO3091.

Potential Impacts and Mitigation Measures

During the pre-Assessment consultation process, the Department of Land and Natural Resources, Engineering Division provided the following comments regarding water demand: *"The applicant should include water demands and infrastructure required to meet the project needs. Please note that the projects within State lands requiring water service from their local Department/Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage. The applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections."* Also during the pre-Assessment consultation process, the Department of Land and Natural Resources, Commission on Water Resource Management provided the following comments regarding water demand: *"The DEA should discuss the projected water demands for the project, both potable and non-potable, and provide the calculations used to estimate demands. The DEA should identify the proposed water source(s) to support the project, and include a discussion of the potential impacts on water resources, other public trust uses of water, and describe any proposed mitigation measures. Alterative water sources to meet non-potable water demands should be identified. Water conservation and efficiency measures to be implemented should also be discussed."*

In addition, during the pre-Assessment consultation period, the State Office of Planning wrote: "We also recommend the Draft EA include…Potential for water reuse with Complex's water and wastewater systems…"

In response to the above comments, SOH provided the following information: The estimated future potable water demands were designed using the "Water System Standards" dated 2002.

The average daily demand is shown in the Potable Water Demands table below. The maximum and peak hour demands were calculated by multiplying the average daily demand by 1.5 and 3, respectively. The daily demand quantities are summarized in the table below.

Estimated Future Potable Water Demands	
Average Daily Demand (gpd):	167,158
Maximum Daily Demand (gpd):	250,767
Peak Hour Demand (gpd):	510,474

The estimated future fire flow demand was determined by referencing the Fire Flow Requirements in the "Water System Standards" dated 2002. The estimated fire flow quantities are summarized in the table below.

Fire Flow Demands	
Required Flow (gpm):	4,000
Duration (hrs):	3
Fire Hydrant Spacing (ft):	250

The proposed food hub is anticipated to require both building and site fire protection as well as potable water. In initial discussions with BWS approximately 2,500 gpm of fire flow is currently available for the site. Thus, there is not anticipated to be enough flow available in the area based on initial discussions with BWS. Since BWS is not currently able to satisfy the offsite fire flow requirement of 4,000 gpm, a possible option is to drill a non-potable water well onsite in accordance with the DLNR Hawaii Well Construction & Pump Installation Standards (2004). Requirements for construction of a non-potable water well includes a well construction permit, a well completion report and a pumping test. The location of the non-potable water well shall be at the farthest distance upstream from wastewater lines or chemical storage, allotting enough room for well modification and maintenance. To withdraw the non-potable water using a pump, a pump installation permit is required. Any discharge lines from the well requires an approved water meter to provide non-potable water withdrawal quantities (Hawaii Well Construction & Pump Installation Standards (2004)). Water pumped from the well would be held in storage tank(s) sized to hold the required volume of fire flow (720,000 gallons) at a minimum. The water would then be distributed to onsite fire hydrants and building sprinkler systems, as necessary. The fire water system will be a separate system from the potable system provided by BWS.

The proposed potable lateral onsite would be connected to the existing BWS 12-inch main along Whitmore Avenue. A meter, meter box, and backflow preventer will likely need to be installed.

Potable water would support proposed building facilities including bathrooms, food processing, and commercial components to the facility. The potable water would also serve as a source of additional irrigation that is not satisfied by the R-1 system explained in section 2.3 above, assuming all agency approvals are obtained.

4.6.3 Wastewater System

A preliminary engineering report (PER) was conducted by Sam O. Hirota (SOH). The PER is included in its entirety in Appendix F and summarized below.

Existing Conditions

City and County of Honolulu spatial data indicates that sewer service is provided to the Whitmore Village community and parcels adjacent to the project site (HOLIS C. a., 2018). An existing 15-inch diameter vitrified clay pipe sewer main runs down the length of Whitmore Avenue and currently is connected to two facilities within the project site (ibid). The pipe system follows Kamehameha Highway down into Wahiawā town and connects with a 36-inch circular reinforced concrete pipe to the Wahiawā Wastewater Treatment Plant (WWTP) at the end of California Avenue. The WWTP is owned and operated by the CCH and services Wahiawā, Whitmore Village and the U.S. Navy's Naval Computer and Telecommunications Master Station Pacific. Treated wastewater is discharged into the Wahiawā Reservoir (ibid).

Prior to 1994, the project site also included the Whitmore Village Wastewater Treatment Plant (WWTP), a secondary treatment plant operated by the City and County of Honolulu that processed approximately 0.201 mgd of sewage. With the addition of the Kahi Kani subdivision, the increased sewage flow exceeded the capacity of the Whitmore Village WWTP and it was subsequently abandoned. The project site currently includes remnants of the facility at the southwest end of the property.

Potential Impacts and Mitigation Measures

The proposed Whitmore Community Food Hub design wastewater flow quantities were calculated by SOH using the Wastewater Flow Standards (Appendix F, Reference 7) set forth by the CCH. The design flow of wastewater was calculated to be 275,846 gallons per day (gpd). A sewer connection application was submitted to DPP on October 12th, application number 2018/SCA-1766. It was denied on October 15th, 2018 with the following remarks: "the downstream 15-inch sewers on Whitmore Avenue are inadequate to support the increase in sewage." According to SOH, a moratorium on the 15-inch line is currently in place as it is inadequate to support the increase in sewage due to the construction of the new Food Hub. The Sewer Connection Letter did not indicate dates lifting the moratorium. During the pre-

Assessment consultation period, the Department of Environmental Services provided the following comments:

> *"…If the project plans to discharge treated effluent and/ or solids to City sewer lines, the details of the concentration(s) and discharge quantities and loads should be included in the Environmental Assessment…Commercial projects that require a building permit and have a sewer connection will need to be evaluated for the issuance of an Industrial Wastewater Discharge Permit (IWDP)."*

Also during the pre-Assessment consultation period, the Wahiawā-Whitmore Village Neighborhood Board 26 wrote:

> *"15. How large will the water storage tanks be, and what will the security measures be to ensure no unexpected flooding. Will the current water and sewage infrastructure be able to manage this project?"*

The following are three possible alternatives for the interim until the moratorium is lifted. The alternatives are subject to several agency approvals.

1) Construct a new gravity line that runs parallel to the existing 15-inch gravity line directly from the project site to the Wahiawā WWTP. This option would prevent further additional improvements within the project site and instead, connect to an existing treatment system. However, the length of the proposed line would be approximately two miles long and would require a siphon system at the Karsten Thot Bridge, similarly to the existing 15-inch line, to convey the flow over the stream and continue towards the Wahiawā WWTP (refer to Appendix F, Exhibit 7 Wahiawā WWTP Location for proposed alignment). This alternative would require approvals from: 1) the Department of Transportation (DOT) for work within the State right-of-way along Whitmore Avenue and Kamehameha Highway; and. 2) DPP Wastewater Branch for additional flow entering the existing Wahiawā WWTP. According to Kwock Associates, Inc. Consulting Engineers, the existing 15-inch sewer line had "a total estimated construction cost of $1,125,000" (1990). Capacity of the Wahiawā WWTP will influence this alternative as well. The capacity of the Wahiawā WWTP will need to be verified to determine if the additional flow from the proposed Food Hub could be treated here. Inflation over time and unforeseen conditions during construction would increase the cost for this alternative, making it unlikely and infeasible.

2) Construct a new R-1 wastewater treatment system at the abandoned Whitmore WWTP location in compliance with the Guidelines for the Treatment and Use of Recycled Water (DOH Wastewater Branch 2002). This alternative would eliminate the need for connection to the

existing system due to the moratorium. Since the wastewater system would be located at the low point of the site, gravity flow would not be an issue. The treated water produced from the proposed system could be used for any form of outdoor irrigation or fire-fighting from outdoor hydrants (DOH Wastewater Branch 2002). It is important to note that DOH would need to approve the proposed system. If there is an existing sewer system within the vicinity of the proposed site, DOH typically does not allow for a separate system. However, due to the limitations of the existing system as stated previously, this alternative would need to be investigated further to obtain any DOH approvals. The construction of the treatment system would also contribute to added cost of the overall project and proper disposal of solids will have to be implemented as needed. Overall, this option would be more cost effective and feasible in comparison to Alternative 1. Two possibilities for the disposal of the treated R-1 water are further explained below:

2a) The treated R-1 water would be used for outdoor irrigation and/or fire protection. The treatment would have to compliant with the R-1 requirements and precautions set forth in the DOH Guidelines for the Treatment and Use of Recycled Water. The treated water could be used for spray, drip, surface, and subsurface irrigation as well as fire suppression for outdoor hydrants (DOH Wastewater Branch 2002). Based on the required flow of 2,000 gallons per minute (gpm) for 2 hours (refer to Appendix F, section 3.2 Design Water Flows), a total of 240,000 gallons would need to be stored in an onsite pond for enough fire flow.

2a) Disposal of the treated water through a drywell-type system into the ground. The remaining treated R-1 water not used for irrigation and/or fire protection would be disposed of properly into the ground surface in compliance with the Guidelines for the Treatment and Use of Recycled Water (DOH Wastewater Branch 2002).The Department of Land and Natural Resources, Division of Aquatic Resources (DAR) provided the following comments during the pre-Assessment consultation process regarding wastewater concerns:

> *"…DAR is concerned about the onsite wastewater treatment pond. We would like to see efforts and plans that prevent the overflow of the wastewater treatment pond. Similarly to the threats mentioned above, wastewater entering the stream environment can compromise water quality and ultimately the aquatic resources that inhabit these streams. Wastewater entering the North fork of Kaukonahua Stream and Wahiawā Public Fishing Area is deemed unacceptable by our agency, thus actions, efforts, and plans that prevent such occurrences is of up [sic] most importance."*

It should be noted that neither wastewater collection, treatment and disposal alternative would involve disposal of treated or untreated wastewater into the North fork of Kaukonahua Street or the Wahiawā Public Fishing Area.

4.6.4 Drainage System

A preliminary engineering report (PER) was conducted by SOH. The PER is included in its entirety in Appendix F and summarized below.

Existing Conditions

Existing site drainage generally flows from the North-East end of the site and eventually flows into the Kaukonahua Stream. Pre-development (or existing) condition can be separated into two main drainage basins split by a gulch near the middle of the site. The existing drainage pattern and basins can be seen in Appendix F, Exhibit 9 (Existing Drainage). The existing condition storm runoff was estimated using the rational method as outlined in CCH "Storm Drainage Standards". Under existing condition, the total estimated runoff was 45.34 cubic feet per second (cfs) (refer to Appendix F, Runoff Calculations).

Basin 1 (23.10 cfs) includes runoff from the West Lot line of Lot 009 to the West edge of the gulch and accounts for nearly one-third of the project area. The high points of the basin lay along Whitmore Avenue allowing runoff to sheet flow in the South-West direction, eventually running off the West/South-West end of the site.

Basin 2 (22.23 cfs) includes stormwater falling on the East end of the site and accounts for the remainder of the site. After falling on the East end of the site, stormwater sheet flows in the South-West direction where it enters a gulch which leads into Kaukonahua Stream.

Potential Impacts and Mitigation Measures

During the pre-Assessment consultation process, the State Office of Planning wrote: "Pursuant to HAR 11-200-10(6) – identification and summary of impacts and alternatives considered, in order to ensure that the surface water and marine resources of Oahu remain protected, the effects of potential stormwater runoff caused by the proposed development activities should be evaluated in the Draft EA."

The development of the project site includes the construction of several new buildings, structures and impervious areas as indicated on Exhibit 8 (Conceptual Master Plan). As a result, the existing drainage system will be altered due to the impervious surfaces that will be constructed as part of the proposed development. The post-development (proposed) condition storm runoff was estimated using the rational method as outlined in CCH "Storm Drainage Standards The improvements will potentially increase the 10-year, 1-hour runoff from 45.34 cfs to 81.53 cfs without mitigation.

A retention basin is an engineered shallow depression that collects and filters storm water runoff using conditioned planting soil beds and vegetation. Retention basins are ideal for a large site with a large amount of impervious area. Several retention basins will contain the additional runoff produced from the project and filter into the ground onsite (Appendix F, Retention Basin Schematic). Retention basins will be placed in each drainage area, retaining more than the total Water Quality Volume (WQV) and preventing the additional runoff from flowing offsite. Six total retention basins will be placed accordingly throughout the project site. The retention basins will be used to treat storm water that sheet flows throughout the site and sized to contain a total WQV of 59,000 cubic feet. With the proposed retention basins in place, the proposed development will not adversely impact the surrounding areas, neighboring properties or the existing drainage system. With LID measures in place, post development runoff will be decreased to under the pre-development drainage conditions.

4.6.5 Solid Waste Disposal

Existing Conditions

The City and County of Honolulu Department of Environmental Services (DES), Solid Waste Division operates and maintains , either by County personnel or by contracted services, all solid waste collection and disposal facilities on the island. Currently there are a total of two landfills, nine public refuse drop-off locations, six convenience centers and three transfer stations for the disposal of commercial and residential generated waste. All residential waste is then processed by the appropriate County solid waste disposal facility. Waste generated from construction and demolition activities is sent to the PVT Integrated Solid Waste Management Facility in Nanakuli. The City and County of Honolulu also operates a waste-to-energy plant located in the Campbell Industrial Park where over 700,000 tons of waste is incinerated to generate 10% of O‘ahu’s power needs. Solid waste generated in the Wahiawā - Whitmore Village region is managed locally at the refuse collection yard located on California Avenue, close to the wastewater treatment plant. There is also one convenience center located next to Schofield Barracks on Wilikina Drive for residential bulk waste disposal.

Potential Impacts and Mitigation Measures

Unrecyclable waste generated by the demolition of structures currently on the project site as well as new construction waste will be disposed of at the PVT Waste Management Facility.

After construction, the Whitmore Community Food Hub will generate solid waste related to the processing warehouse facility, commercial spaces and rental housing uses. The project is anticipated to impact the long term waste generation in the area, however, it is not expected to

overtax current capacity as operations of all of the proposed elements of the Complex will include recycling measures.

4.6.6 Electrical and Communication Systems

Existing Conditions

Hawaiian Electric Company (HECO) serves all of the City and County of Honolulu with oil generated power plants in Pearl City and Kapolei, a waste-to-energy power plant (HPOWER) in Kapolei, and renewable energy generators across the island.

Hawaiian Telcom and Spectrum provide telephone and cable services to the Wahiawā area. Consultation with Spectrum identified existing CATV infrastructure on Tax Map Key (TMK) number (1) 7-1-002:004 and immediately surrounding the parcel. Aerial CATV lines are present along Whitmore Avenue and down the center width of the parcel identifies as TMK (1) 7-1-002:004. Connecting aerial CATV lines also extend to existing buildings along the northwest corridor of the parcel, adjacent to the residential development. Underground CATV lines are found only at the far northeast side of the parcel.

Potential Impacts and Mitigation Measures No impacts are anticipated to electrical and communication systems. The food hub facilities and residential development will connect to existing infrastructure. Demand is not expected to exceed the capacity of either existing electrical or communication systems.

4.7 HAZARDOUS WASTES AND MATERIALS

Existing Conditions

Preliminary research of the U.S. Environmental Protection Agency (USEPA) Envirofacts database shows that the project site has previously been permitted for a hazardous waste handler and two National Pollutant Discharge Elimination System (NPDES) permitted water discharge activities on the property. Dole Packaged Foods Company is listed by the USEPA Resource Conservation and Recovery Act inventory system on hazardous waste, however specific chemicals used on site is not listed (USEPA, 2018). The City and County of Honolulu was issued an NPDES permit on December of 1974 and the permit expired in March 1992 for non-potable wastewater discharge in the North Fork Kaukonahua Stream. An NPDES permit was also issued to Glad's Landscaping in November 2013. No air pollution sources, superfund or brownfield sites have been identified within a ½ mile radius of the proposed Whitmore Community Food Hub, and no active large quantity generators of hazardous wastes are located within a ¼ mile radius of the Whitmore Community Food Hub site.

Potential Impacts and Mitigation Measures

Based on the preliminary findings from available public data, there are no present recognized environmental conditions (RECs) that would adversely impact the use of the site for the Whitmore Community Food Hub project. During the pre-Assessment consultation process, the Wahiawā-Whitmore Village Neighborhood Board No. 26 wrote:

"10. This facility is located near residential neighborhoods; what kind of research would be performed at the facility? What kind of chemicals will be on site and what safety measures will be in place? Will there be security around the existing facilities?

11. What kind of machinery will be on site, what will the noise level, smells, and wastewater or other bio impacts be and how will these issues be addressed for the safety of the community? What about the environmental concerns regarding fuel, motor oils, rags, etc. What safety measures will be taken?"

As noted in Section 2.1.3, the Agribusiness Development Corporation has received Capital Improvement Project (CIP) funds to construct a number of research pathology/ quarantine greenhouses at several locations across the State, including on the project site. The planned greenhouse on the project site may be used by pathologists, entomologists, breeders, and horticulturalists for agricultural research and may also be used to identify energy, waste, and carbon reduction strategies. The use and storage of pesticides and herbicides in agriculture is regulated by the regulated by the Hawaii Department of Agriculture, Plant Industry Division, Pesticides Branch.

Regardless of the type of machinery that will be on site, the Hawaii Occupational Safety and Health Law and Regulations are intended to assure safe and healthful working conditions for the women and men of the State. Employers are responsible to furnish employees with workplaces that are safe and free from recognized hazards. The laws and regulations are enforced through workplace inspections conducted by Hawaii Occupational Safety and Health Division (HIOSH) compliance officers (Occupational Safety and Health Compliance Officers (OSHCOs), and Environmental Health Specialists (EHSs)). Inspections are conducted without advance notice (§ 396-4(b)(6), HRS). If the employer objects to the inspection, HIOSH can obtain a search warrant (§ 396-4(d)(1), HRS). Where violations of standards or regulations are found, citations are issued. Where the violation's classification is determined to be serious, willful or repeat, a penalty shall be proposed (§ 396-10(b), -10(f), HRS). Under the Federal Occupational Safety and Health Act (OSHA), such penalties are first-instance sanctions (i.e., no warning upon initial finding).

4.8 SOCIO-ECONOMIC CHARACTERISTICS

4.8.1 Population

Existing Conditions

Population data is available for the year 2016 from the U.S. Census American Community Survey 5-Year Estimates as shown in the following table. The median age in Wahiawā is slightly older than the State and County median, while the percentage of children under 18 is roughly equal across geographic areas. Wahiawā has a 94.1% occupied housing rate, higher than the 90.3% and 84.9% occupancy rates at the County and State level respectively.

Table 1: Census 2016 Population Data

Characteristic	Wahiawā CDP	City & County of Honolulu	State of Hawai'i
Total population	17,696	986,999	1,413,673
Median age in years	39.4	37.4	38.5
% of population under 18	21.8%	21.6%	21.8%
% of population 65 years and over	17.7%	15.9%	16.1%
% of population that identifies as one race	71.8%	76.8%	76.2%
White alone	16%	21.2%	25.0%
Black or African American alone	1.3%	2.4%	1.8%
Am. Indian & Alaska Native alone	0.1%	0.1%	0.2%
Asian alone	42.3%	42.9%	38.0%
Native Hawaiian & Other Pacific Islander	11.2%	9.4%	10.2%
Some other Race	0.8%	0.9%	1.0%
Two or more races	28.2%	23.2%	23.8%
Total Housing Units	6,037	342,982	530,289
Occupied Housing Units	5,678	309,548	450,030

Potential Impacts and Mitigation Measures

During the pre-Assessment consultation period, State Representative District 46, Lei Learmont asked questions the operations of the proposed workforce housing, including who it would be rented to, who would be managing the units, and the costs of maintenance."

Also, during the pre-Assessment consultation process, the Wahiawā-Whitmore Village Neighborhood Board No. 26 wrote:

> *"14. Who will work in the fields? Are you building housing for the workers? Why don't you build housing for people already here?..."*

The Whitmore Community Food Hub includes a proposal to provide workforce housing in the form of micro-units as a way to address housing affordability for farmworkers. As currently contemplated, the agricultural workforce housing component of the project will involve 100 single occupancy dwelling units with each sized about 250 to 300 square feet per unit. The units are not expected to increase area population and were designed to address the housing needs of local farmers and agricultural production businesses. The Whitmore Community Food Hub is expected to benefit the Wahiawā (especially Whitmore Village) population by providing additional affordable housing units (for those who will be farming or working at the Food Hub), and providing new employment opportunities within walking distance. There is currently no design for building the proposed workforce housing. ADC will not develop any affordable workforce housing on the site but may lease the property to HHFDC or a private developer to develop and operate such a product.

During the pre-Assessment consultation process, the City and County of Honolulu Department of Community Services wrote that: "…the proposed project will have no adverse impacts on any Department of Community Services activities or projects at this time."

4.8.2 Agriculture and Economy

Existing Conditions

In the 1800s, Wahiawā was established as a thriving agricultural community where pineapple, sandalwood, and sugarcane were cultivated. Pineapple plantations were particularly prevalent in the area at the time, with the largest owned and managed by The Dole Company. As Dole moved processing operations, Wahiawā has begun the slow transition to diversified agriculture but has not seen a large employer take the place of the Dole processing facilities. The U.S. Census Public Use Microdata Area (PUMA) Statistics Report states that rural Oʻahu, which includes Wahiawā, Waianae, North Shore Koʻolauloa, currently has the highest unemployment rate of all other areas in the state (P.U.M.A., 2011).

The food hub is located within the Enterprise Zone (EZ) as designated by the State of Hawaii, Department of Business, Economic Development and Tourism. The Enterprise Zone Partnership Program gives businesses within the designated EZ area tax and other incentives in order to stimulate business activity. Companies eligible to participate in the program must be located within an Enterprise Zone and must have at least half of the firm's gross annual income come from agricultural production or processing, wholesaling and distribution, or biotechnology research, among other activities. Benefits from participating in the program include state and county tax exemptions, non-refundable income tax credits, priority permit processing, zoning variances or building permit waivers, property tax adjustments, and priority consideration for federal job training or community development funds.

Potential Impacts and Mitigation Measures

During the pre-Assessment consultation process, the Wahiawā-Whitmore Village Neighborhood Board No. 26 wrote:

> *"1. Food Hub Retail and Visitor Center: Who determined that Whitmore Village should become a tourist destination? How many people/visitors are anticipated to stop by?...*
>
> *6. What kind of impact will this proposed Whitmore Food Hub Retail and Visitor Center have on our neighboring Dole Plantation operation?...*
>
> *8. Who or what types of business are being sought?. What type of work opportunity will there be for residents? Good, paying jobs or retail like food and beverage businesses?*
>
> *9. Who will be using the processing facilities at the Food Hub? Open to anyone? What safety measures will be in place for them to succeed? What kind of impact would this have on our neighboring Kunia Village which also has a packing plant?...*

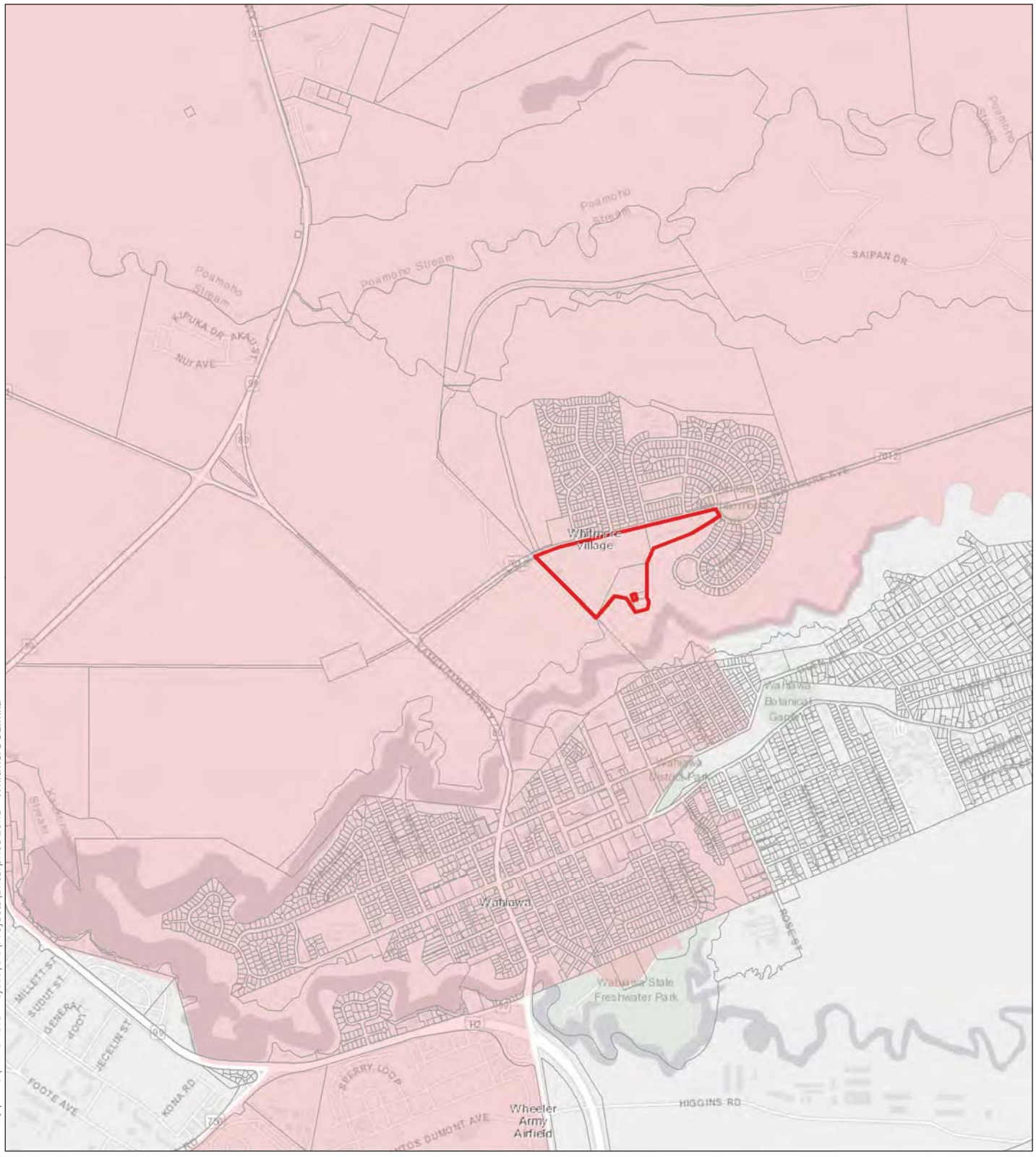
12. What kind of office spaces will be offered, and to who?"

The Whitmore Community Food Hub proposes a number of facilities (including offices) and spaces that will support the economic and social vitality of Wahiawā. The core food hub processing facility will support small local farmers by providing a space where they can aggregate, process, store, market and distribute their products. The planned public space will support the need for a more walkable, diverse use neighborhood. A modest farmers market would also support local agricultural production, increase accessibility to locally produced fresh produce to the surrounding neighborhood, potentially create more jobs or support current employment rates, and boost economic opportunities for the area. Because the food hub is located within a designated Enterprise Zone, the lessee(s) of the project can take advantage of beneficial tax incentives while growing and developing a more robust agricultural community.

The facilities and supportive services proposed are aimed at servicing local small to medium sized agricultural production companies, farmers, and service workers. The range of employment opportunities will vary but will most likely consist of agricultural research and husbandry, agricultural production, supportive services such as custodial and retail, and administrative support. As such, it is unlikely to compete directly with the Dole Plantation visitor destination operation.

During the pre-Assessment consultation process, Wahiawa Fresh!, a community-based development organization (WCBDO), wrote:

> *"Wahiawa Fresh! is a grassroots community organization that works to improve the economic outlook of historic Wahiawā town. Our board is made up of residents, business owners, and service providers. Our group serves within the Wahiawā NRSA (Neighborhood Revitalization Strategy Area) which includes Wahiawā town, Whitmore Village, parts of Schofield Barracks, and the surrounding agricultural lands. Wahiawa Fresh! advocates for sensible economic development projects in the area and therefore stands in support of the projected Whitmore Project…*
>
> *In addition, the Whitmore project represents the state's strong commitment to food sustainability. The food hub concept will attract farmers to the area by providing shared supports and infrastructure to make processing, packing and selling cost effective and efficient."*



PDF: Q:\Oahu\Whitmore Project\PDF\Figures
Path: Q:\Oahu\Whitmore Project\GIS\Projects\Enterprise Zone - Whitmore 01.mxd

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.
Source: ESRI, United States Geological Survey, 2017, City and County of Honolulu, 2017.

DATE: 12/4/2018

LEGEND

- Project Scope
- Tax Map Key Parcels
- Enterprise Zone

Figure 12 :
Enterprise Zone

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation — O'ahu

North

Linear Scale (feet)
0 500 1,000 2,000

PBR HAWAII & ASSOCIATES, INC.

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4.9 PUBLIC SERVICES AND FACILITIES

4.9.1 Schools

Existing Conditions

Public Schools in Wahiawā include Wahiawā Elementary (grades K-5), Daniel K. Inouye Elementary School (grades K-5), Helemano Elementary School (grades K-5), Iliahi Elementary School (grades K-5), Kaala Elementary School (grades K-5), Wahiawā Middle School (grades 06-08), Leilehua High School (grades 9-12) and Wahiawā Community School (which is an adult education facility).

Wheeler Air Force Base has two elementary schools and an intermediate school on base including Major Sheldon Wheeler Elementary School (grades K-5), Major Sheldon Wheeler Intermediate School (grades 6 – 8) and Sergeant Samuel K. Solomon Elementary School (grades K – 5).

There are two private schools in the vicinity of the site, Hoʻāla School (grades K-12), and Trinity Lutheran Church and School (grades K-8). Both are located less than a mile apart off of California Avenue.

University of Hawaiʻi's flagship campus, UH Mānoa is located in Honolulu and offers Bachelor and Master Degree programs.

Potential Impacts and Mitigation Measures

The Whitmore Community Food Hub aims to service current residents and farmers within Central Oʻahu and does not anticipate generating new residents or introducing new school-aged children to the area. Therefore, no additional demands will be placed on DOE facilities. The proposed project may include agricultural workforce rental housing units, however the units will be limited square footage and not planned as family dwelling units. The Whitmore Community Food Hub also aims to improve connectivity and walkability around the Whitmore Village community which will benefit the K-12 population and their families in the area.

4.9.2 Police, Fire and Medical Services

Existing Conditions

Police Protection

The Honolulu Police Department Wahiawā branch is located on N. Cane Street, approximately 1.4 miles from the site.

Fire Protection

The nearest fire station to the site is the City and County of Honolulu Fire Department located 1.2 miles from the site on California Avenue.

Medical Services

The closest hospital serving the greater Central O'ahu and North Shore communities is Wahiawā General Hospital located in Wahiawā on Lehua Street. This 53-bed acute care facility provides critical care, diagnostic imaging, nursing and rehabilitation, and surgical services. In addition to the hospital, there are a number of specialty offices and medical clinics including: Minute Clinic, Naval Branch Medical Clinic, Diagnostic Laboratory Services, and Wahiawā Family Practice Clinic.

Potential Impacts and Mitigation Measures

During the pre-Assessment consultation process, the Honolulu Fire Department wrote:

> *"1. Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet from fire department access roads as measured by an approved route around the exterior of the building or facility...*
>
> *A fire department access road shall extend to within 50 feet of at least one exterior door that can be opened from the outside and that provides access to the interior of the building…*
>
> *2. A water supply approved by the county, capable of supplying the required fire flow for fire protection, shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ [Authority Having Jurisdiction]...*
>
> *3. The unobstructed width and unobstructed vertical clearance of a fire apparatus access road shall meet county requirements…"*
>
> *4. Submit civil drawings to the HFD for review and approval."*

The complex will be provided fire lanes and fire hydrants as required on-site. There may be an occasional and unavoidable demand for police, fire, and medical services associated with the Whitmore Community Food Hub, however, it is anticipated that the existing services will not be adversely affected by the proposed project.

4.9.3 Recreational Facilities

Existing Conditions

There are a number of parks and recreational spaces in the Wahiawā-Whitmore Village area, with several parks immediately surrounding the project site. The Kahi Kani Neighborhood Park, Whitmore Community Park, and the Whitmore Neighborhood Park are all located less than a quarter mile from the proposed project location.

In addition to neighborhood parks, the George Fred Write Wahiawā District Park and the Wahiawā Botanical Garden are located approximately 2.5 miles from the site. The 27-acre botanical garden and forested preserve was founded as an experimental arboretum and now is home to a collection of native Hawaiian plant species. The Wahiawā District Park has a number of recreational facilities including baseball fields, basketball courts, a public swimming pool, and community spaces where the Wahiawā-Whitmore Village Neighborhood Board No. 26 meetings are held.

Potential Impacts and Mitigation Measures

During the pre-Assessment consultation process, the City and County of Honolulu Department of Parks and Recreation wrote that: "If it is determined that the 100 unit workforce micro-housing is subject to the requirements of the Park Dedication Ordinance please include in the environmental assessment how the project proposes to meet those requirements." ADC will not develop any affordable workforce housing on the site but may lease the property to HHFDC or a private developer to develop such a product. It's possible the developer will seek HRS 201H approval and ask that the Park Dedication requirements be waived for the project. The Whitmore Community Food Hub is not expected to negatively impact recreational facilities in the Wahiawā-Whitmore Village area. The proposed project will enhance the civic experience in Wahiawā town and provide additional recreational opportunities for the Whitmore Village community including the new landscaped public spaces and a pedestrian path around the property.

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5 LAND USE CONFORMANCE, POLICIES, AND CONTROLS

The processing of various permits and approvals are prerequisites to the creation of the project. Relevant Federal, State of Hawai'i and City and County of Honolulu land use plans, policies, and ordinances are described below.

5.1 FEDERAL

5.1.1 Clean Water Act

The Clean Water Act establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.

The National Pollutant Discharge Elimination System (NPDES) permit system is part of the implementation program of the Clean Water Act. NPDES permits are required when pollutants are proposed to be discharged into navigable waters or when more than an acre of land disturbance is proposed. Although no work in a waterway is proposed, a NPDES permit will be required because there will likely be in excess of one acre of land disturbance for the project. Unless the No Action alternative is selected, an NPDES permit will be pursued.

Implementation of the proposed drainage improvements, including several retention basis, will result in no increase in discharge into North Fork of Kaukonahua Stream (via surface runoff) over existing conditions (discussed in Section 4.6.4).

5.2 STATE OF HAWAIʻI

5.2.1 State Environmental Review Law (Chapter 343, Hawaiʻi Revised Statutes)

Preparation of this document is in accordance with the provisions of Chapter 343, HRS and Title 11, Chapter 200, HAR pertaining to Environmental Assessments. Section 343-5, HRS identifies nine types of actions that "trigger" compliance, which requires an EA. The use of State or County funds and/or lands is one of these "triggers." The preparation of an EA is required because the proposed Whitmore Community Food Hub is located on State lands and will use State funds. It will also include improvements and/or connections to, and/or easements across, State or County facilities and lands in relation to infrastructure improvements for public facilities, roadways, water, sewer, utility, and drainage facilities. While the specific nature of each improvement is not known at this time, the EA is intended to address all current and future instances involving the use of State and/or County lands and funds relating to the project.

5.2.2 State Land Use Law (Chapter 205, Hawaiʻi Revised Statutes)

The State Land Use Law (Chapter 205, HRS) establishes the State Land Use Commission and authorizes this body to designate all lands in the State into one of four districts: Urban, Rural, Agricultural, or Conservation. The Whitmore Community Food Hub is located within the State Agricultural and Urban Districts (Figure 4). During the pre-Assessment consultation process, the City and County of Honolulu, Department of Planning and Permitting requested the following information:

> *(1) The tenant type…for any retail space and how products sold will meet Sections 205-2 and 205-4.5, Hawaii Revised Statutes (the State Land Use Law);*
>
> *(2) The tenant type for office space…and how these uses meet the State Land Use Law;*
>
> *(3) How the tenants of the housing units will meet the farm dwelling or farm employee housing definitions of the State Land Use Law…*

Based on the above comment, a meeting with DPP was held on November 9, 2018. At the meeting, ADC Director James Nakatani provided the vision for the proposed Food Hub project (primarily to provide food safety processing services to smaller farmers of former Galbraith Estate lands and other nearby lands), but also noted that both food safety requirements and technology are ever-evolving. As a result of the meeting, DPP staff present had a better understanding of how the proposed uses may be permitted under HRS Chapter 205, as well as under Chapter 21, Revised Ordinance of Honolulu. The proposed uses are consistent with the Agricultural and Urban designations of the site.

5.2.3 Hawai‘i Coastal Zone Management Program (Chapter 205A, Hawai‘i Revised Statutes)

During the pre-Assessment consultation process, the State Office of Planning wrote: "…the Draft EA should contain analysis on the project's consistency with HRS 205A-2." The National Coastal Zone Management (CZM) Program was created through passage of the Coastal Zone Management Act of 1972. Hawai‘i's CZM Program, adopted as Chapter 205A, HRS, provides a basis for protecting, restoring, and responsibly developing coastal communities and resources. The objectives and policies of the CZM Program encompass broad concerns such as impact on recreational resources, historic and archaeological resources, coastal scenic resources and open space, coastal ecosystems, coastal hazards, and the management of development. Each of the Counties have adopted SMAs in which a development's consistency with the objectives and policies of the CZM program are evaluated through the SMA permitting process. The site is located outside of The City and County of Honolulu's designated SMA. As the entire State is located within the Coastal Zone Management area, the consistency of the proposed Whitmore Community Food Hub with the objectives and policies of the CZM program is discussed below.

Table 2 Coastal Zone Management Act, Chapter 205A, and HRS

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

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	**S**	**N/S**	**N/A**
Recreational Resources			
Objective: (A) Provide coastal recreational opportunities accessible to the public.			
Policies:			
1. Improve coordination and funding of coastal recreational planning and management; and			**X**
2. Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:			**X**
1. Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;			**X**
2. Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;			**X**
3. Providing and managing adequate public access, consistent with conservation of			**X**

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	S	N/S	N/A
natural resources, to and along shorelines with recreational value;			
4. Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;			**X**
5. Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;			**X**
6. Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;	**X**		
7. Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and			**X**
8. Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.			**X**
Discussion: The Whitmore Community Food Hub is not anticipated to generate additional demands on existing public parks. To protect water resources for purposes including recreation, the State of Hawai'i has adopted water quality standards. Generally, these standards will require the submittal and adherence to a NPDES permit. This permit requires compliance with BMPs during construction to minimize soil erosion into adjacent waterways. The NPDES permit will also include requirements to maintain water quality during operation. An NPDES permit will be required for the development of the Whitmore Community Food Hub.			
Historic Resources			
Objective: (A) Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.			
Policies:			
1. Identify and analyze significant archaeological resources;	**X**		
2. Maximize information retention through preservation of remains and artifacts or salvage operations; and	**X**		
3. Support state goals for protection, restoration, interpretation, and display of historic resources.	**X**		

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	S	N/S	N/A
Discussion: An archaeological inventory survey and cultural impact assessment was conducted as part of this environmental assessment. No archaeological resources, remains or artifacts were found during the course of the survey. Buildings located on site were evaluated for historical and cultural significance and were found to be of no preservation value. However, based on community feedback and the proximity of the proposed project location to the Kukaniloko birthing stones, it is recommended that the beliefs of the guardians of *Kukaniloko* and other Native Hawaiians be taken into account in an effort to allow the community that values the traditional cultural property to determine its significance. It is suggested that any future redevelopment projects incorporate a reference to the cultural significance of Wahiawā as the former birthplace of the Lo Aliʻi and the home of the *puʻuhonua* Kūkaniloko. It has also been recommended that ADC collaborate with local community members, such as the members of the Hawaiian Civic Club of Wahiawā and cultural practitioners to determine the best approach to creating a culturally sensitive representation of the significance of the area that will honor the beliefs and traditional customs of the Native Hawaiian community of Wahiawā.			
Scenic and Open Space Resources			
Objective: (A) Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.			
Policies:			
1. Identify valued scenic resources in the coastal zone management area;	**X**		
2. Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;	**X**		
3. Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and			**X**
4. Encourage those developments that are not coastal dependent to locate in inland areas.	**X**		
Discussion: The Whitmore Community Food Hub will not impinge upon any significant public scenic view corridors (along Whitmore Avenue and along the North Fork of Kaukonahua Stream) towards the Koʻolau and Waianae Mountain Ranges and will have no significant impact on coastal views. The Whitmore Community Food Hub will be designed with sensitivity to pedestrians by providing a major pedestrian pathway along the outer edge of the project site. The Whitmore Community Food Hub is also a non-coastal dependent development located inland in an existing agricultural and residential area.			
Coastal Ecosystems			
Objective: (A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.			
Policies:			

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	S	N/S	N/A
1. Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;			**X**
2. Improve the technical basis for natural resource management;			**X**
3. Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;			**X**
4. Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and			**X**
5. Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.	**X**		
Discussion: The Wahiawā Community Food Hub site is located approximately 9 miles from the shoreline in Pearl Harbor. Appropriate BMPs and erosion control measures will be implemented to ensure that coastal ecosystems are not adversely impacted by construction activities. The drainage system will be designed in accordance with applicable regulatory standards to mitigate potential adverse impact to surrounding properties and the North Fork of Kaukonahua Stream.			
Economic Uses			
Objective: (A) Provide public or private facilities and improvements important to the State's economy in suitable locations.			
Policies:			
1. Concentrate coastal dependent development in appropriate areas;			**X**
2. Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and			**X**
3. Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:			**X**
1. Use of presently designated locations is not feasible;			**X**
2. Adverse environmental effects are minimized; and			**X**

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	S	N/S	N/A
3. The development is important to the State's economy.			**X**
Discussion: The Whitmore Community Food Hub is not a coastal dependent development and is located approximately 9 miles from the shoreline in Pearl Harbor. However, the Whitmore Community Food Hub will support economic development in Central O'ahu by promoting growth within the agricultural industry and supporting local small farmers in an area that is uniquely situated for former and future agricultural processing. The site is located in a prime location to best serve small farmers and potentially provide affordable agricultural workforce housing all of which is in alignment with the objective and policies for economic use.			
Coastal Hazards			
Objective: (A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.			
Policies:			
1. Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;	**X**		
2. Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;			**X**
3. Ensure that developments comply with requirements of the Federal Flood Insurance Program; and	**X**		
4. Prevent coastal flooding from inland projects.			**X**
Discussion: The Whitmore Community Food Hub is not anticipated to increase the site's exposure to flooding. The site is located in an area outside of the 0.2% annual chance floodplain (Zone D, see Figure 11), and is located in the center of the island (approximately 9 miles from the shoreline in Pearl Harbor), well outside of both the Tsunami Evacuation Zone and the Extreme Tsunami Evacuation Zone. The project will follow BMPs to mitigate point and nonpoint sources of pollution. This Environmental Assessment (EA) is intended to communicate information on natural hazards that may impact the proposed project.			
Managing Development			
Objective: (A) Improve the development review process, communication, and public participation in the management of coastal resources and hazards.			
Policies:			
1. Use, implement, and enforce existing law effectively to the maximum extent possible			**X**

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	S	N/S	N/A
in managing present and future coastal zone development;			
2. Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and			**X**
3. Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.			**X**
Discussion: Potential short and long-term impacts of the Whitmore Community Food Hub will be reviewed by the public and agencies through this EA public review process.			
Public Participation			
Objective: (A) Stimulate public awareness, education, and participation in coastal management.			
Policies:			
1. Promote public involvement in coastal zone management processes;			**X**
2. Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and			**X**
3. Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.			**X**
Discussion: This EA serves as a disclosure document of potential impacts and mitigation measures, including coastal management issues. The EA is published in the Office of Environmental Quality Control's *The Environmental Notice*, whereby opportunity for comment by agencies and the public are provided. Pre-Assessment consultation comments for this EA were obtained and are reproduced in Appendix G. In addition, the most recent presentation to the Wahiawā-Whitmore Village Neighborhood Board No. 26 was made on October 15, 2018.			
Beach Protection			
Objective: (A) Protect beaches for public use and recreation.			
Policies:			
1. Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;			**X**

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	S	N/S	N/A
2. Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and			**X**
3. Minimize the construction of public erosion-protection structures seaward of the shoreline.			**X**
4. Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor; and			**X**
5. Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor.			**X**
Discussion: The site is located away from the shoreline (approximately 9 miles from the shoreline in Pearl Harbor), as such, adverse impacts on beach processes are not expected. Appropriate BMPs and erosion control measures will be implemented to ensure that coastal ecosystems are not adversely impacted by construction activities. The drainage system will be designed in accordance with applicable regulatory standards to mitigate potential adverse impact to surrounding properties.			
Marine Resources			
Objective: (A) Promote the protection, use, and development of marine and coastal resources to assure their sustainability.			
Policies:			
1. Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;			**X**
2. Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;			**X**
3. Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;			**X**
4. Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and			**X**

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	S	N/S	N/A
5. Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.			**X**
Discussion: The Whitmore Community Food Hub is not expected to have a significant adverse impact on marine or coastal resources. The project is located on the Central O'ahu plain, well outside of the coastal zone (approximately 9 miles from the shoreline in Pearl Harbor). Appropriate best management practices (BMPs) and erosion control measures will be implemented to ensure that marine and coastal resources are not adversely impacted by construction activities.			

5.2.4 Hawai'i State Planning Act, Chapter 226, Hawai'i Revised Statutes

During the pre-Assessment consultation process, the State Office of Planning wrote: "…the Draft EA should discuss the project and its consistency with State goals and priorities set forth in HRS Chapter 226. This analysis should examine the project's consistency with all three parts of HRS Chapter 226…"

The Hawai'i State Plan (Chapter 226, HRS) sets forth the goals, objectives, policies, and priority guidelines for growth, development, and allocation of limited resources throughout the State. It contains diverse policies and objectives on topics of state interest including but not limited to, the economy, agriculture, the visitor industry, federal expenditure, the physical environment, facility systems, socio-cultural advancement, and sustainability. Conformity with applicable provisions of the State Plan are discussed below. The State Plan is divided into three parts, Part I (Overall Theme, Goals and Policies); Part II (Planning, Coordination and Implementation); and Part III (Priority Guidelines). Parts I and III are provided in matrix format below and the checked boxes indicate whether the individual objectives and policies are supported, not supported, or not applicable. Part II includes an analysis of the project it pertains to the Agriculture State Functional Plan and how the individual objectives and policies are supported. Applicable goals and policies of the Hawai'i State Plan are discussed below.

Table 3: Hawai'i State Plan, Chapter 226, HRS, Part I: Overall Theme, Goals, Objectives and Policies

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
HRS § 226-1: Findings and Purpose			
HRS § 226-2: Definitions			

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

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
One of the basic functions of our society is to enhance the ability of individuals and groups to pursue their goals freely, to satisfy basic needs and to secure desired socio-economic levels. The elements of choice and mobility within society's legal framework are fundamental rights. Society's role is to encourage conditions within which individuals and groups can approach their desired levels of self-reliance and self-determination. This enables people to gain confidence and self-esteem; citizens contribute more when they possess such qualities in a free and open society. Government promotes citizen freedom, self-reliance, self-determination, social and civic responsibility and goals achievement by keeping order, by increasing cooperation among many diverse individuals and groups, and by fostering social and civic responsibilities that affect the general welfare. The greater the number and activities of individuals and groups, the more complex government's role becomes. The function of government, however, is to assist citizens in attaining their goals. Government provides for meaningful participation by the people in decision-making and for effective access to authority as well as an equitable sharing of benefits. Citizens have a responsibility to work with their government to contribute to society's improvement. They must also conduct their activities within an agreed-upon legal system that protects human rights.	**X**		
Discussion: The Whitmore Community Food Hub implements the unifying theme, principles and values of the Hawaiʻi State Plan principally through providing infrastructure that aids in the economic and social choices and development of farmers and community members throughout Central Oʻahu. The project aims to help revitalize agricultural production by providing facilities that allows farming to be a viable and revenue generating career opportunity once again. This objective supports social and economic mobility in a region of Oʻahu that has seen a decline in economic development since the closure or significant downscaling of agricultural production from large, monocrop companies such as Dole Plantation. The Whitmore Community Food Hub will provide a processing warehouse, community open space, and agricultural workforce rental housing that will encourage individual and family choices, allow for greater self-sufficiency and generate short and long term employment opportunities. In summary, the project will support healthy social, economic, and physical environments that benefit the future customers, community programs, employees of the proposed project, and the community as a whole.			
HRS § 226-4: State Goals.			

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
Objectives: In order to guarantee, for the present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:			
1. A strong, viable economy, characterized by stability, diversity and growth that enables fulfillment of the needs and expectations of Hawaii's present and future generations.	**X**		
2. A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.	**X**		
3. Physical, social and economic well-being, for individuals and families in Hawaii, that nourishes a sense of community responsibility, of caring and of participation in community life.	**X**		
Discussion*:* The Whitmore Community Food Hub will promote a stronger, more viable economy through the provision of infrastructure and facilities that support small scale farmers across the central plain. An economy based on agricultural production can be robust and can maintain the rural natural beauty of the region that is cherished by residents and visitors alike. Supporting agricultural production will also ensure a more sustainable and stable food supply for Oʻahu which will increase the physical and social well-being of Hawaii's families.			
HRS § 226-5: Objectives and policies for population.			
Objective: It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic and social objectives contained in this chapter.			
Policies:			
(1) Manage population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social and economic aspirations while recognizing the unique needs of each County.			**X**
(2) Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.			**X**

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		**S**	**N/S**	**N/A**
(3)	Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.	**X**		
(4)	Encourage research activities and public awareness programs to foster an understanding of Hawaii's limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawaii's population.			**X**
(5)	Encourage federal actions and coordination among major governmental agencies to promote a more balanced distribution of immigrants among the states, provided that such actions do not prevent the reunion of immediate family members.			**X**
(6)	Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state's population.			**X**
(7)	Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.			**X**
Discussion: The Whitmore Community Food Hub does not influence population growth patterns but will provide the appropriate resources to accommodate the growing population's needs for healthy and sustainable food. The proposed project may also provide a number of housing units that will support current housing needs and the demand for affordable housing.				
HRS § 226-6: Objectives and policies for the economy in general.				
Objectives: Planning for the State's economy in general shall be directed toward achievement of the following objectives:				
(1)	Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people, while at the same time stimulating the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.	**X**		
(2)	A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.	**X**		

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

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		**S**	**N/S**	**N/A**
(13)	Foster greater cooperation and coordination between the government and private sectors in developing Hawaii's employment and economic growth opportunities.	**X**		
(14)	Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.	**X**		
(15)	Maintain acceptable working conditions and standards for Hawaii's workers.	**X**		
(16)	Provide equal employment opportunities for all segments of Hawaii's population through affirmative action and nondiscrimination measures.			**X**
(17)	Stimulate the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.			**X**
(18)	Encourage businesses that have favorable financial multiplier effects within Hawaii's economy, particularly with respect to emerging industries in science and technology.			**X**
(19)	Promote and protect intangible resources in Hawaii, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.			**X**
(20)	Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new or innovative potential growth industries in particular.			**X**
(21)	Foster a business climate in Hawaii--including attitudes, tax and regulatory policies, and financial and technical assistance programs--that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry.			**X**
***Discussion**:* The Whitmore Community Food Hub will support small-scale economic activity by providing a facility where small scale farmers can process and sell their agricultural goods efficiently and cost effectively. The Whitmore Community Food Hub will also provide increased opportunities for Hawaiʻi's people to pursue their socio-economic aspirations by providing both short-term (construction) and long-term (facility operations and management) employment opportunities.				

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
HRS § 226-7: Objectives and policies for the economy - agriculture			
Objectives: Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:			
1 Viability of Hawaii's sugar and pineapple industries.			**X**
2 Growth and development of diversified agriculture throughout the State.	**X**		
3 An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being.	**X**		
Policies:			
(1) Establish a clear direction for Hawaii's agriculture through stakeholder commitment and advocacy.	**X**		
(2) Encourage agriculture by making best use of natural resources.	**X**		
(3) Provide the governor and the legislature with information and options needed for prudent decision making for the development of agriculture.			**X**
(4) Establish strong relationships between the agricultural and visitor industries for mutual marketing benefits.	**X**		
(5) Foster increased public awareness and understanding of the contributions and benefits of agriculture as a major sector of Hawaii's economy.	**X**		
(6) Seek the enactment and retention of federal and state legislation that benefits Hawaii's agricultural industries.			**X**
(7) Strengthen diversified agriculture by developing an effective promotion, marketing, and distribution system between Hawaii's producers and consumer markets locally, on the continental United States, and internationally.	**X**		

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		**S**	**N/S**	**N/A**
(8)	Support research and development activities that provide greater efficiency and economic productivity in agriculture.	**X**		
(9)	Enhance agricultural growth by providing public incentives and encouraging private initiatives.			**X**
(10)	Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.			**X**
(11)	Increase the attractiveness and opportunities for an agricultural education and livelihood.	**X**		
(12)	Expand Hawaii's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.	**X**		
(13)	Promote economically competitive activities that increase Hawaii's agricultural self-sufficiency.	**X**		
(14)	Promote and assist in the establishment of sound financial programs for diversified agriculture.	**X**		
(15)	Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.			**X**
(16)	Facilitate the transition of agricultural lands in economically unfeasible agricultural production to economically viable agricultural uses.			**X**
(17)	Perpetuate, promote, and increase use of traditional Hawaiian farming systems, such as the use of loko ia, mala, and irrigated loi, and growth of traditional Hawaiian crops, such as kalo, uala, and ulu.	**X**		
(18)	Increase and develop small-scale farms.	**X**		
***Discussion**:* The proposed Whitmore Community Food Hub supports the development of diversified agriculture and the economic sustainability of small scale farmers. This project is an integral part of implementing the State's goal of investing in the agricultural industry for the benefit of Hawaii's farmers and residents.				

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
HRS § 226-8: Objectives and policies for the economy – visitor industry			
Objectives: Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaii's economy.			
Policies:			
(1) Support and assist in the promotion of Hawaii's visitor attractions and facilities.			**X**
(2) Ensure that visitor industry activities are in keeping with the social, economic, and physical needs and aspirations of Hawaii's people.			**X**
(3) Improve the quality of existing visitor destination areas.			**X**
(4) Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.			**X**
(5) Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawaii's people.			**X**
(6) Provide opportunities for Hawaii's people to obtain job training and education that will allow for upward mobility within the visitor industry.			**X**
(7) Foster a recognition of the contribution of the visitor industry to Hawaii's economy and the need to perpetuate the aloha spirit.			**X**
(8) Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawaii's cultures and values.			**X**
***Discussion**:* The proposed Whitmore Community Food Hub may include a small visitor's center and farmers market that can accommodate visitor use and spending. However, the goal of the project is to support agricultural production throughout the central plain, provide access to fresh and affordable locally grown produce to the surrounding community, support economic development and sustainability for Wahiawā and include the opportunity for affordable rental housing. The project should not be construed as a tourist or visitor attraction endeavor.			

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
HRS § 226-9: 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 Hawaii's economy.			
Policies:			
(1) Encourage the sustained flow of federal expenditures in Hawaii that generates long-term government civilian employment.			**X**
(2) Promote Hawaii's supportive role in national defense.			**X**
(3) Promote the development of federally supported activities in Hawaii that respect statewide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawaii's environment.			**X**
(4) Increase opportunities for entry and advancement of Hawaii's people into federal government service.			**X**
(5) Promote federal use of local commodities, services, and facilities available in Hawaii.			**X**
(6) Strengthen federal-state-county communication and coordination in all federal activities that affect Hawaii.			**X**
(7) Pursue the return of federally controlled lands in Hawaii that are not required for either the defense of the nation or for other purposes of national importance, and promote the mutually beneficial exchanges of land between federal agencies, the State, and the counties.			**X**
***Discussion**:* The Whitmore Community Food Hub is not seeking federal funding for any phase of the project at this time.			
HRS § 226-10: Objectives and policies for the economy – potential growth and innovative activities.			
Objective: Planning for the State's economy with regard to potential growth activities shall be directed towards achievement of the objective of development and expansion of potential growth activities that serve to increase and diversify Hawaii's economic base.			
Policies:			

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		**S**	**N/S**	**N/A**
(1)	Facilitate investment and employment growth in economic activities that have the potential to expand and diversify Hawaii's economy, including but not limited to diversified agriculture, aquaculture, renewable energy development, creative media, health care, and science and technology-based sectors.	**X**		
(2)	Facilitate investment in innovative activity that may pose risks or be less labor-intensive than other traditional business activity, but if successful, will generate revenue in Hawaii through the export of services or products or substitution of imported services or products;			**X**
(3)	Encourage entrepreneurship in innovative activity by academic researchers and instructors who may not have the background, skill, or initial inclination to commercially exploit their discoveries or achievements.			**X**
(4)	Recognize that innovative activity is not exclusively dependent upon individuals with advanced formal education, but that many self-taught, motivated individuals are able, willing, sufficiently knowledgeable, and equipped with the attitude necessary to undertake innovative activity.			**X**
(5)	Increase the opportunities for investors in innovative activity and talent engaged in innovative activity to personally meet and interact at cultural, art, entertainment, culinary, athletic, or visitor-oriented events without a business focus;			**X**
(6)	Expand Hawaii's capacity to attract and service international programs and activities that generate employment for Hawaii's people.			**X**
(7)	Enhance and promote Hawaii's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts.			**X**
(8)	Accelerate research and development of new energy-related industries based on wind, solar, ocean, underground resources, and solid waste.			**X**
(9)	Promote Hawaii's geographic, environmental, social, and technological advantages to attract new or innovative economic activities into the State.			**X**
(10)	Provide public incentives and encourage private initiative to attract new or innovative industries that best support Hawaii's social, economic, physical, and environmental objectives.			**X**

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(11) Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research.	**X**		
(12) Develop, promote, and support research and educational and training programs that will enhance Hawaii's ability to attract and develop economic activities of benefit to Hawaii.			**X**
(13) Foster a broader public recognition and understanding of the potential benefits of new or innovative growth-oriented industry in Hawaii.			**X**
(14) Encourage the development and implementation of joint federal and state initiatives to attract federal programs and projects that will support Hawaii's social, economic, physical, and environmental objectives.			**X**
(15) Increase research and development of businesses and services in the telecommunications and information industries.			**X**
(16) Foster the research and development of non-fossil fuel and energy efficient modes of transportation.			**X**
(17) Recognize and promote health care and health care information technology as growth industries.			**X**
***Discussion**:* The Whitmore Community Food Hub supports the growth of the agricultural industry, particularly diversified agricultural production, thereby directly expanding and diversifying of Hawaii's economy.			
HRS § 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 Hawaii as a leader in broadband and wireless communications and applications in the Pacific Region.			
Policies:			
(1) Encourage the continued development and expansion of the telecommunications infrastructure serving Hawaii to accommodate future growth in the information industry;			**X**

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(2) Facilitate the development of new business and service ventures in the information industry which will provide employment opportunities for the people of Hawaii;			**X**
(3) Encourage greater cooperation between the public and private sectors in developing and maintaining a well- designed information industry;			**X**
(4) Ensure that the development of new businesses and services in the industry are in keeping with the social, economic, and physical needs and aspirations of Hawaii's people;			**X**
(5) Provide opportunities for Hawaii's people to obtain job training and education that will allow for upward mobility within the information industry;			**X**
(6) Foster a recognition of the contribution of the information industry to Hawaii's economy; and			**X**
(7) Assist in the promotion of Hawaii as a broker, creator, and processor of information in the Pacific.			**X**
***Discussion**:* The Whitmore Community Food Hub does not have any relation to the goals and policies set out for the information industry at this time.			
HRS § 226-11: Objectives and policies for the physical environment – land-based, shoreline, and marine resources.			
Objectives: Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources.			
(1) Prudent use of Hawaii's land-based, shoreline, and marine resources.	**X**		
(2) Effective protection of Hawaii's unique and fragile environmental resources.			**X**
Policies:			
(1) Exercise an overall conservation ethic in the use of Hawaii's natural resources.	**X**		

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.			**X**
(3) Take into account the physical attributes of areas when planning and designing activities and facilities.	**X**		
(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.	**X**		
(5) Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.	**X**		
(6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawaii.	**X**		
(7) Provide public incentives that encourage private actions to protect significant natural resources from degradation or unnecessary depletion.	**X**		
(8) Pursue compatible relationships among activities, facilities, and natural resources.	**X**		
(9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.	**X**		
***Discussion**:* The proposed project is supportive of objectives and policies for the physical environment by repurposing previously developed land. As such, this represents the prudent use of Hawaii's land-based resources. The Whitmore Community Food Hub is located in an existing agricultural area that has been previously disturbed since pre-contact times. By retaining current use of the property as a processing facility, it allows rural areas to remain rural by supporting existing farms. In addition, no impact to threatened, endangered, or candidate plants, birds, animals, or other species is anticipated as none are known to currently inhabit the property, and the property does not provide a suitable habitat for these species. All outdoor lighting will also be fully-shielded and downward facing to minimize impacts to endangered native birds such as the Hawaiian petrel and Newell's shearwater. To protect marine water quality, the Whitmore Community Food Hub will be designed and built in compliance with all applicable Federal, State, and City regulations pertaining to storm water management, including the DOH NPDES permit program. Where applicable, the Whitmore Community Food Hub will incorporate low impact development strategies into the design of the project.			

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
HRS § 226-12: Objectives 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 Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources.			
Policies:			
(1) Promote the preservation and restoration of significant natural and historic resources.			**X**
(2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities.			**X**
(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.	**X**		
(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.	**X**		
(5) Encourage the design of developments and activities that complement the natural beauty of the islands.			**X**
***Discussion**:* The Whitmore Community Food Hub will be designed and landscaped to be compatible with the character of the surrounding area, while incorporating cultural and environment themes appropriate to the history and context of the Wahiawā area. Views of the Koʻolau range to the east and the Waianae range to the west from the site will be preserved.			
HRS § 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:			
(1) Maintenance and pursuit of improved quality in Hawaii's land, air, and water resources.	**X**		

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(2) Greater public awareness and appreciation of Hawaii's environmental resources.	**X**		
Policies:			
(1) Foster educational activities that promote a better understanding of Hawaii's limited environmental resources.	**X**		
(2) Promote the proper management of Hawaii's land and water resources.	**X**		
(3) Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters.	**X**		
(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaii's people.	**X**		
(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.	**X**		
(6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.	**X**		
(7) Encourage urban developments in close proximity to existing services and facilities.	**X**		
(8) Foster recognition of the importance and value of the land, air, and water resources to Hawaii's people, their cultures and visitors.	**X**		
***Discussion**:* Best management practices will be implemented during construction per State regulations and City and County of Honolulu requirements in order to maintain and preserve Hawaiʻi's land, air, and water resources. Structures will be designed to current code requirements for the safety and protection of users and building occupants in the case of natural or man-induced hazards and disasters. The landscape design will consist of functional and aesthetic applications that integrates low impact development (LID) and green infrastructure strategies into the design. This EA is intended to communicate environmental issues to neighbors and the surrounding public for their review and comments.			

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
HRS § 226-14: 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.			
Policies:			
(1) Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.	**X**		
(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.	**X**		
(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.	**X**		
(1) Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction, and maintenance of facility systems.	**X**		
Discussion*:* While the proposed project does not directly improve the State's facility systems, the Whitmore Community Food Hub is located in a moderately developed area that is served by municipal infrastructure, and aims to better support the farming needs of Oʻahu's small diversified agricultural production farmers, directly accommodating to the facility needs of Hawai'i's people.			
HRS § 226-15: Objectives and policies for facility systems – solid and liquid wastes.			
Objectives: Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:			
(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.	**X**		
(2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.	**X**		

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
Policies:			
(1) Encourage the adequate development of sewerage facilities that complement planned growth.	**X**		
(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.	**X**		
(3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.			**X**
***Discussion**:* While the proposed project does not directly improve the State's facility systems, the Whitmore Community Food Hub is located in a moderately developed area that is served by municipal solid and liquid sanitary treatment and disposal facilities. A new R-1 wastewater treatment system or a new gravity line that runs parallel to the existing 15-inch gravity line may be included in the development of the food hub facility in addition to any current structures that are connected to the existing sewer system. The potential onsite treatment infrastructure is proposed as an alternative to support the planned growth associated with the facility. After construction, the Whitmore Community Food Hub will generate solid waste related to daily use and operation. To minimize waste, recycling bins will be provided where applicable. Waste that cannot be recycled will be processed by the appropriate County solid waste disposal facility.			
HRS § 226-16: Objectives 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.			
Policies:			
(1) Coordinate development of land use activities with existing and potential water supply.	**X**		
(2) Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.			**X**
(3) Reclaim and encourage the productive use of runoff water and wastewater discharges.	**X**		

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(4) Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.	**X**		
(5) Support water supply services to areas experiencing critical water problems.			**X**
(6) Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.			**X**
***Discussion**:* The project civil engineering consultant, Sam O. Hirota, Inc. is coordinating with the Board of Water Supply (BWS) to ensure there is adequate water source, storage and delivery to service the proposed project. ADC acknowledges that water conservation is a critical component of reducing water demand, thus lessening the demand on water supply.			
HRS § 226-17: Objectives and policies for facility systems – transportation.			
Objective: Planning for the State's facility systems with regard to transportation shall be directed toward the achievement of the following objectives, giving due consideration to all:			
(1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.			**X**
(2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.			**X**
Policies:			
(1) Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;			**X**
(2) Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives;	**X**		
(3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;			**X**

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		**S**	**N/S**	**N/A**
(4)	Provide for improved accessibility to shipping, docking, and storage facilities;	**X**		
(5)	Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;			**X**
(6)	Encourage transportation systems that serve to accommodate present and future development needs of communities;			**X**
(7)	Encourage a variety of carriers to offer increased opportunities and advantages to interisland movement of people and goods;			**X**
(8)	Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;			**X**
(9)	Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification;			**X**
(10)	Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment;	**X**		
(11)	Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation;	**X**		
(12)	Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives; and	**X**		
(13)	Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.	**X**		
***Discussion**:* The Whitmore Community Food Hub abuts an existing roadway, Whitmore Ave, which connects to Kamehameha Highway but is outside of the most congested portion through Wahiawā Town. The proposed Whitmore Community Food Hub will be designed to support the State's objectives and policies for Complete Streets (Hawaii State Act 54, Session Laws of Hawaii 2009) and transportation (HRS § 226-17**)**. As part of the EA process, the project is coordinating with both State and County transportation agencies and has conducted a mobility analysis to better understand the potential impacts the proposed project may have on Whitmore Village community.				

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
HRS § 226-18: 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:			
(1) Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;			**X**
(2) Increased energy self-sufficiency where the ratio of indigenous to imported energy use is increased;			**X**
(3) Greater energy security in the face of threats to Hawaii's energy supplies and systems; and			**X**
(4) Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use.			**X**
Policies:			
(1) Support research and development as well as promote the use of renewable energy sources;			**X**
(2) Ensure that the combination of energy supplies and energy-saving systems is sufficient to support the demands of growth;			**X**
(3) Base decisions of least-cost supply-side and demand-side energy resource options on a comparison of their total costs and benefits when a least-cost is determined by a reasonably comprehensive, quantitative, and qualitative accounting of their long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits;			**X**
(4) Promote all cost-effective conservation of power and fuel supplies through measures including:			**X**
(1) Development of cost-effective demand-side management programs;			**X**
(2) Education; and			**X**
(3) Adoption of energy-efficient practices and technologies.			**X**

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(5) Ensure to the extent that new supply-side resources are needed, the development or expansion of energy systems utilizes the least-cost energy supply option and maximizes efficient technologies;			**X**
(6) Support research, development, and demonstration of energy efficiency, load management, and other demand-side management programs, practices, and technologies;			**X**
(7) Promote alternate fuels and energy efficiency by encouraging diversification of transportation modes and infrastructure;			**X**
(8) Support actions that reduce, avoid, or sequester greenhouse gases in utility, transportation, and industrial sector applications; and			**X**
(9) Support actions that reduce, avoid, or sequester Hawaii's greenhouse gas emissions through agriculture and forestry initiatives.			**X**
***Discussion**:* As written, the State's objectives and policies for energy facility systems are not pertinent the proposed project. Whitmore Community Food Hub has no direct relationship to energy development, although energy-efficient design practices may be used to reduce costs where possible, including consideration for a photo-voltaic energy system. The design also encourages walking within the project site and to adjacent parkways which can also reduce the impacts of vehicle use and other less sustainable means of transportation.			
HRS § 226-18.5: Objectives and policies for facility systems—telecommunications.			
Objective: Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.			
Policies:			
(1) Facilitate research and development of telecommunications systems and resources;			**X**
(2) Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning;			**X**

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(3) Promote efficient management and use of existing telecommunications systems and services; and			**X**
(4) Facilitate the development of education and training of telecommunications personnel.			**X**
***Discussion**:* As written, the State's objectives and policies for telecommunications facility are not pertinent to the proposed project. We have been notified by one telecommunications provider that there is an existing easement(s) and existing utility lines that impact the project site. The Whitmore Community Food Hub will be designed in coordination with the various telecommunication companies to service the building facilities.			
HRS § 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:			
(1) Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawaii's population.	**X**		
(2) The orderly development of residential areas sensitive to community needs and other land uses.	**X**		
(3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawaii's people.	**X**		
Policies:			
(1) Effectively accommodate the housing needs of Hawaii's people.	**X**		
(2) Stimulate and promote feasible approaches that increase affordable rental and for sale housing choices for extremely low-, very low-, lower-, moderate-, and above moderate-income households.	**X**		

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.	**X**		
(4) Promote appropriate improvement, rehabilitation, and maintenance of existing rental and for sale housing units and residential areas.			**X**
(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.	**X**		
(6) Facilitate the use of available vacant, developable, and underutilized urban lands for housing.	**X**		
(7) Foster a variety of lifestyles traditional to Hawaii through the design and maintenance of neighborhoods that reflect the culture and values of the community.	**X**		
(8) Promote research and development of methods to reduce the cost of housing construction in Hawaii.			**X**
Discussion: The Whitmore Community Food Hub may include the provision of agricultural workforce rental housing in the form of 100 single occupancy dwelling units around 250 to 300 square feet per unit. The proposed dwelling units address the increasing need of affordable housing and caters specifically to the needs of the surrounding community. The rental housing component of the food hub will be located on the area of the project site that is already zoned for urban and residential use. The housing units will be adjacent to an existing single family neighborhood which will provide a smooth transition from housing to agricultural work facilities. The Agribusiness Development Corporation will work in coordination with other State agencies responsible for housing development if rental housing is ultimately pursued on the site.			
HRS § 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:			
(1) Fulfillment of basic individual health needs of the general public.			**X**

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(2) Maintenance of sanitary and environmentally healthful conditions in Hawaii's communities.			**X**
Policies:			
(3) Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.			**X**
(4) 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**
(5) Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care and related insurance costs.			**X**
(6) Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.			**X**
(7) Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.			**X**
(8) Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring, and enforcement.			**X**
(9) 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**

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
***Discussion**:* The Whitmore Community Food Hub is not directly involved with the State's health planning initiatives. However, the proposed project will be compliant with the Food Safety Modernization Act (FSMA) which regulates how foods are grown, harvested and processed. Compliance with this federal standard will ensure consumers are protected and food is processed appropriately. The facility will be a place where the local community can buy fresh fruits and vegetables, increasing access to affordable fresh produce. Given the large percentage of racially and economically diverse individuals and families in Wahiawā, the increased access to produce will benefit native Hawaiians and others more prone to health based risks.			
HRS § 226-21: Objectives and policies for socio-cultural advancement – education.			
Objectives: Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.			
Policies:			
(1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.			**X**
(2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.			**X**
(3) Provide appropriate educational opportunities for groups with special needs.			**X**
(1) Promote educational programs which enhance understanding of Hawaii's cultural heritage.			**X**
(2) Provide higher educational opportunities that enable Hawaii's people to adapt to changing employment demands.			**X**
(3) 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**
(4) Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.			**X**

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(5) Emphasize quality educational programs in Hawaii's institutions to promote academic excellence.			**X**
(6) Support research programs and activities that enhance the education programs of the State.			**X**
***Discussion**:* The Whitmore Community Food Hub will have a research and innovation hub that will support the innovation and advancement of the agricultural industry. Agricultural workforce educational programs may be a part of the services provided by the 'Research and Innovation Hub' component of the proposed project.			
HRS § 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.			
Policies:			
(1) Assist individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic hardship conditions, through social services and activities within the State's fiscal capacities.			**X**
(2) Promote coordination and integrative approaches among public and private agencies and programs to jointly address social problems that will enable individuals, families, and groups to deal effectively with social problems and to enhance their participation in society.			**X**
(3) Facilitate the adjustment of new residents, especially recently arrived immigrants, into Hawaii's communities.			**X**
(4) Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.			**X**
(5) Support public and private efforts to prevent domestic abuse and child molestation, and assist victims of abuse and neglect.			**X**

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(6) Promote programs which assist people in need of family planning services to enable them to meet their needs.			**X**
***Discussion**:* The facility will have spaces for community gatherings and a pedestrian pathway along the border of the project site. Public spaces are planned to promote the rich historical character of the area, stimulate economic growth, and emphasize cultural practices in the Wahiawā – Whitmore Village area.			
HRS § 226-23: Objectives and policies for socio-cultural advancement – leisure.			
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.			
Policies:			
• Foster and preserve Hawaii'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 Hawaii'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 Hawaii's people.			**X**

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
• 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 Hawaii's population to participate in the creative arts.			**X**
• Assure adequate access to significant natural and cultural resources in public ownership.			**X**
***Discussion**:* The Whitmore Community Food Hub has no direct relationship to the State's initiatives for "socio-cultural advancement – leisure" at this time.			
HRS § 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.			
Policies:			
(1) Provide effective services and activities that protect individuals from criminal acts and unfair practices and that alleviate the consequences of criminal acts in order to foster a safe and secure environment.			**X**
(2) Uphold and protect the national and state constitutional rights of every individual.			**X**
(3) Assure access to, and availability of, legal assistance, consumer protection, and other public services which strive to attain social justice.			**X**
(4) Ensure equal opportunities for individual participation in society.			**X**
***Discussion**:* The Whitmore Community Food Hub has no direct relationship to the State's initiatives for "socio-cultural advancement – individual rights and personal well-being" at this time.			

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
HRS § 226-25: Objectives 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 Hawaii's people.			
Policies:			
A. Foster increased knowledge and understanding of Hawaii's ethnic and cultural heritages and the history of Hawaii.	**X**		
B. Support activities and conditions that promote cultural values, customs, and arts that enrich the lifestyles of Hawaii's people and which are sensitive and responsive to family and community needs.			**X**
C. Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community lifestyles in Hawaii.			**X**
D. Encourage the essence of the aloha spirit in people's daily activities to promote harmonious relationships among Hawaii's people and visitors.			**X**
Discussion: The Whitmore Community Food Hub will provide opportunities for cultural and historical education by displaying images from plantation era life and other historical and cultural images around the community open spaces. The images will educate visitors on native agricultural techniques, such as wet taro cultivation, as well as the unique multicultural background of early agricultural farmers.			
HRS § 226-26: Objectives and policies for socio-cultural advancement – public safety.			
Objectives: Planning for the State's socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:			
i. Assurance of public safety and adequate protection of life and property for all people.			**X**

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
i. 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**
i. Promotion of a sense of community responsibility for the welfare and safety of Hawaii's people.			**X**
Policies related to public safety:			
i. Ensure that public safety programs are effective and responsive to community needs.			**X**
i. Encourage increased community awareness and participation in public safety programs.			**X**
Policies related to criminal justice:			
A. Support criminal justice programs aimed at preventing and curtailing criminal activities.			**X**
B. Develop a coordinated, systematic approach to criminal justice administration among all criminal justice agencies.			**X**
C. 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 related to emergency management:			
A. 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**
B. Enhance the coordination between emergency management programs throughout the State.			**X**

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
***Discussion**:* The proposed project does not directly advance the objectives and policies for "socio-cultural advancement – public safety," however, the Whitmore Community Food Hub will incorporate considerations for the safety of the community, and will comply with appropriate HI-EMA evacuation procedures.			
HRS § 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:			
(1) Efficient, effective, and responsive government services at all levels in the State.	**X**		
(2) Fiscal integrity, responsibility, and efficiency in the state government and county governments.	**X**		
Policies:			
(1) Provide for necessary public goods and services not assumed by the private sector.	**X**		
(2) Pursue an openness and responsiveness in government that permits the flow of public information, interaction, and response.	**X**		
(3) Minimize the size of government to that necessary to be effective.			**X**
(4) Stimulate the responsibility in citizens to productively participate in government for a better Hawaii.	**X**		
(5) Assure that government attitudes, actions, and services are sensitive to community needs and concerns.	**X**		
(6) Provide for a balanced fiscal budget.			**X**
(7) Improve the fiscal budgeting and management system of the State.			**X**
(8) Promote the consolidation of state and county governmental functions to increase the effective and efficient delivery of government programs and services and to eliminate duplicative services wherever feasible.			**X**

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
***Discussion**:* The Whitmore Community Food Hub has been initiated by the ADC to efficiently and effectively respond to community needs and concerns. Project team representatives have participated in community outreach events and met with many stakeholders, community leaders, private groups and government agencies in the course of preparing the plan and designs for the Whitmore Community Food Hub project. This extensive outreach has allowed community members and stakeholders to participate in the development of the proposed conceptual design, which incorporates many of their concerns. Ultimately, the food hub aims to provide processing infrastructure that efficiently pools resources for small scale farmers and makes farming a sustainable career for individuals living in central Oʻahu.			

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5.2.4.1 Hawai'i State Plan (Chapter 226, HRS), Part II: Planning Coordination and Implementation

Part II of the State Plan establishes a statewide planning system to coordinate and guide all major state and county activities and to implement the overall theme, goals, objectives, policies, and priority guidelines. The system implements the State Plan through the development of functional plans and county general plans. Functional plans, general plans, and the formulation, administration, and implementation of state programs must be in conformance with the State Plan.

- State Functional Plans

State Functional Plans (SFPs) set forth the policies, statewide guidelines, and priorities within a specific field of activity, when such activity or program is proposed, administered, or funded by any agency of the state. Functional plans are developed by the state agency primarily responsible for a given functional area, which include: Agriculture, Conservation Lands, Education, Employment, Energy, Health, Higher Education, Historic Preservation, Housing, Human Services, Recreation, Tourism, and Transportation. Functional plans must identify priority issues in the functional area and contain objectives, policies, and implementing actions to address those priority issues. Actions may include organizational or management initiatives, facility or physical infrastructure development initiatives, initiatives for programs and services, or legislative proposals. Functional plans are approved by the governor and serve as guidelines for funding and implementation by state and county agencies. In addition, functional plans shall be used to guide the allocation of resources for the implementation of state policies adopted by the legislature.

- Agriculture Functional Plan

The State Agriculture Functional Plan (the Plan) sets forth the policies, programs, and projects for implementing the agricultural and agriculture-related objectives, policies, and priority guidelines contained in the Hawaii State Plan. For agriculture, the two fundamental objectives to be achieved are: (1) continued viability in Hawaii's sugar and pineapple industries, and (2) continued growth and development of diversified agriculture throughout the State. The mission of the State Agriculture Functional Plan is ultimately to increase the overall level of agricultural development in Hawaii, in accordance with the two fundamental Hawaii State Plan objectives stated above. The overall goal for the agricultural development process is to ensure the continued growth, diversification and increased self-sufficiency of diversified agriculture. Preparation and implementation of the State Agriculture Functional Plan is within the statutory responsibilities and duties of the Department of Agriculture. The following objectives and policies are applicable to the Whitmore Community Food Hub.

- *This Functional Plan is one means to support a "Vision of Hawaiian Agriculture". The future of Hawaiian agriculture is envisioned to have:*

  (c) Greatest growth in diversified crops and products

- *Growth in diversified crops and products requires:*

  (b) ensuring that factors critical to achieving this growth potential are in place

- *Factors in achieving the potentials of diversified crops and products include... linked production, processing, and manufacturing;*
- *This Functional Plan outlines actions directed at some of the factors and conditions that are keys to achieving the "Vision of Hawaiian Agriculture". The Plan clusters objectives related to these essential factors and conditions under one of four issue areas.*
  - *Services and Infrastructure:*
    - *Agricultural Infrastructure: There is a general need for adequate support services and infrastructure to meet the needs of agriculture.*

Discussion:

The Whitmore Community Food Hub is designed as a community based supply chain infrastructure that supports small, diversified agricultural producers with the processing, storing, marketing and distributing of their crops and agricultural products. The infrastructure is critical to achieving the growth in small growers since the processing facility allows for a reduction in individual production costs. The project meets the vision, goals and actions outlined in the functional plan by developing agricultural production infrastructure that supports greater growth in diversified crops. The project site presents a unique opportunity to support growers from the Oahu Central Plain as well as from the North Shore while also being well connected to existing transportation corridors. The facility has been sited and planned based on the understanding of the agricultural production characteristics and envisions the opportunity to revitalize sustainable crop yields on Oahu.

Table 4: Hawai‘i State Plan, Chapter 226, HRS, Part III: Priority Guidelines

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
HRS § 226-101: Purpose. The purpose of this part is to establish overall priority guidelines to address areas of statewide concern.			
HRS § 226-102: Overall direction. The State shall strive to improve the quality of life for Hawaii's present and future present and future population through the pursuit of desirable courses of action in five major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, and quality education.			
HRS § 226-103: Economic priority guidelines.			
(a) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawaii'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:			
(A) Reflect long term commitments to the State;	**X**		
(B) Rely on economic linkages within the local economy;	**X**		
(C) Diversify the economy;	**X**		
(D) Reinvest in the local economy;	**X**		
(E) Are sensitive to community needs and priorities; and	**X**		
(F) Demonstrate a commitment to provide management opportunities to Hawaii residents.	**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 Hawaii;			**X**
(iii) Investment interest from Hawaii residents;	**X**		
(iv) Resources unique to Hawaii that are required for innovative activity; and			**X**

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(v) Complementary or supportive industries or government programs or projects.	**X**		
(A) Encourage the expansion of technological research to assist industry development and support the development and commercialization of technological advancements.			**X**
(B) 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**
(C) Seek to ensure that state business tax and labor laws and administrative policies are equitable, rational, and predictable.			**X**
(D) Streamline the building and development permit and review process, and eliminate or consolidate other burdensome or duplicative governmental requirements imposed on business, where public health, safety and welfare would not be adversely affected.			**X**
(E) Encourage the formation of cooperatives and other favorable marketing or distribution arrangements at the regional or local level to assist Hawaii's small-scale producers, manufacturers, and distributors.	**X**		
(F) Continue to seek legislation to protect Hawaii from transportation interruptions between Hawaii and the continental United States.			**X**
(G) Provide public incentives and encourage private initiative to develop and attract industries which promise long-term growth potentials and which have the following characteristics:	**X**		
(A) An industry that can take advantage of Hawaii's unique location and available physical and human resources.	**X**		
(B) A clean industry that would have minimal adverse effects on Hawaii's environment.	**X**		
(C) An industry that is willing to hire and train Hawaii'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**		

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(H) Support and encourage, through educational and technical assistance programs and other means, expanded opportunities for employee ownership and participation in Hawaii business.			**X**
(I) Enhance the quality of Hawaii's labor force and develop and maintain career opportunities for Hawaii's people through the following actions:	**X**		
(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 Hawaii's people by encouraging firms doing business in the State to hire residents.			**X**
(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:			
(A) Promote visitor satisfaction by fostering an environment which enhances the Aloha Spirit and minimizes inconveniences to Hawaii's residents and visitors.			**X**
(B) 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**
(C) 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**

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(D) Encourage visitor industry practices and activities which respect, preserve, and enhance Hawaii's significant natural, scenic, historic, and cultural resources.			**X**
(E) Develop and maintain career opportunities in the visitor industry for Hawaii's people, with emphasis on managerial positions.			**X**
(F) Support and coordinate tourism promotion abroad to enhance Hawaii's share of existing and potential visitor markets.			**X**
(G) Maintain and encourage a more favorable resort investment climate consistent with the objectives of this chapter.			**X**
(H) Support law enforcement activities that provide a safer environment for both visitors and residents alike.			**X**
(I) 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:			
(A) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.			**X**
(B) Continue efforts to maintain federal support to provide stable sugar prices high enough to allow profitable operations in Hawaii.			**X**
(C) 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 aquaculture lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquaculture 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**

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(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 Hawaii's agricultural community.			**X**
(6) Seek favorable freight rates for Hawaii's agricultural products from interisland and overseas transportation operators.			**X**
(7) Encourage the development and expansion of agricultural and aquaculture 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 Hawaii's farmers by purchasing locally grown food and food products.	**X**		
(e) Priority guidelines for water use and development:			
(A) Maintain and improve water conservation programs to reduce the overall water consumption rate.			**X**
(B) Encourage the improvement of irrigation technology and promote the use of nonpotable water for agricultural and landscaping purposes.			**X**
(C) Increase the support for research and development of economically feasible alternative water sources.			**X**
(D) 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:			

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
• Encourage the development, demonstration, and commercialization of renewable energy sources.			**X**
• Initiate, maintain, and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy.			**X**
• Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings.			**X**
• 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:			
• Establish an information network that will serve as the catalyst for establishing a viable information industry in Hawaii.			**X**
• 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**
• Encourage the development of small businesses in the information field such as software development, the development of new information systems and peripherals, data conversion and data entry services, and home or cottage services such as computer programming, secretarial, and accounting services.			**X**
• Encourage the development or expansion of educational and training opportunities for residents in the information and telecommunications fields.			**X**
• Encourage research activities, including legal research in the information and telecommunications fields.			**X**
• Support promotional activities to market Hawaii's information industry services.			**X**

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
• 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**:* The Proposed Project will encourage reinvestment in farming, particularly small diversified agricultural production, and support local businesses and residents by reviving the agricultural industry in central O'ahu. The project will support research and innovation through the research greenhouse presently slated for construction in 2019 as well as will promote the consumption of locally produced food through an open air farmers market.			
HRS § 226-104: Population growth and land resources priority guidelines.			
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 Hawaii's people.			**X**
2. Manage a growth rate for Hawaii's economy that will parallel future employment needs for Hawaii'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**

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
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**

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(10) Identify critical environmental areas in Hawaii 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**
(12) Utilize Hawaii'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 Hawaii's shoreline, open spaces, and scenic resources.			**X**
***Discussion**:* The Whitmore Community Food Hub is located on a previously developed parcel and will not take away from the current inventory of prime agricultural land or any greenfield site. Providing the facility will encourage the use of surrounding agricultural land for farming as the facility intends to significantly reduce the cost of agricultural production and increase the attractiveness of farming in the central plain. In so doing, the proposed project aims to utilize Hawaii's resources wisely by redeveloping land to take advantage of the highest and best use while promoting the conservation the surrounding farmland for future generations.			
HRS § 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**

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		**S**	**N/S**	**N/A**
(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**:* The Whitmore Community Food Hub has no direct relationship to the priority guidelines described above on crime and criminal justice at this time.				
HRS § 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**		
(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 Hawaii'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 Hawaii's people for the purchase of initial owner- occupied housing.			**X**

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(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 Hawaii's residents and less priority to development of housing intended primarily for individuals outside of Hawaii.	**X**		
***Discussion**:* The Whitmore Community Food Hub aims to develop agricultural workforce rental housing units during Phase II of the plan. The housing units are designed to accommodate farmers and agricultural production workers who would work at the facility and those who work on adjacent agricultural lands. Housing will be affordable due to its location and size and is planned for local residents.			
HRS § 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**
1. The electronic exchange of information;			**X**
2. Statewide electronic mail; and			**X**
3. Access to the Internet.			**X**

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
Encourage programs that increase the public's awareness and understanding of the impact of information technologies on our lives;			**X**
(6) Pursue the establishment of Hawaii's public and private universities and colleges as research and training centers of the Pacific;			**X**
(7) Develop resources and programs for early childhood education;			**X**
(8) Explore alternatives for funding and delivery of educational services to improve the overall quality of education; and			**X**
(9) Strengthen and expand educational programs and services for students with special needs.			**X**
***Discussion**:* The Whitmore Community Food Hub has no direct relationship to the priority guidelines described above on quality education.			
HRS § 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 Hawaii.	**X**		

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		**S**	**N/S**	**N/A**
Discussion: The Whitmore Community Food Hub meets the priority guidelines for sustainable development as it encourages the balanced use of natural resources, is proposed on an existing developed site, and promotes a more diversified economic base.				
HRS § 226-109: Climate change adaptation priority guidelines.				
Priority guidelines to prepare the State to address the impacts of climate change, including impacts to the areas of agriculture; conservation lands; coastal and nearshore marine areas; natural and cultural resources; education; energy; higher education; health; historic preservation; water resources; the built environment, such as housing, recreation, transportation; and the economy shall:				
(1)	Ensure that Hawaii'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 Hawaii'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**

HAWAII STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		**S**	**N/S**	**N/A**
(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: Reviewers of this EA are informed and made aware of the impacts climate change may have on this proposed project, as well as the Whitmore Village/Wahiawā area. As indicated in Section 3.5.2, Climate Change And Sea Level Rise (SLR), the proposed project is not anticipated to have significant, immediate flooding as a result of climate change related impacts.				

5.3 CITY AND COUNTY OF HONOLULU

County-specific land use plans and ordinances pertaining to the Whitmore Community Food Hub include the O'ahu General Plan, the Central O'ahu Sustainable Communities Plan, the Wahiawā Urban Design Plan and the Revised Ordinances of Honolulu (ROH).

5.3.1 O'ahu General Plan

The General Plan is the comprehensive policy document for the island of O'ahu that sets the long-range objectives and policies to guide the programs and activities of the City and County of Honolulu. The following objectives and policies are applicable to the Whitmore Community Food Hub.

II. Economic Activity

Objective A: *To promote employment opportunities that will enable all the people of O'ahu to attain a decent standard of living.*

Policies:

(1) Encourage the growth and diversification of O'ahu's economic base.

(2) Encourage the development of small businesses and larger industries which will contribute to the economic and social well-being of O'ahu residents.

Objective C: *To maintain the viability of agriculture on O'ahu.*

Policies:

(1) Assist the agricultural industry to ensure the continuation of agriculture as an important source of income and employment.

(2) Support agricultural diversification in all agricultural areas on O'ahu.

(3) Support the development of markets for local products, particularly those with the potential for economic growth.

(7) Encourage the use of more efficient production practices by agriculture, including the efficient use of water.

Discussion: The Whitmore Community Food Hub will contribute towards the growing and diversified economic base of Wahiawā by providing infrastructure that supports the local farmer's ability to process food crops. The facility may also have a farmers market within the planned public space to encourage local residents and visitors to purchase local products. The facility is also conveniently located along a major transportation corridor that connects the North

Shore to Honolulu, making the transportation and sale of locally produced agricultural goods more economical.

III. Natural Environment

Objective A: *To protect and preserve the natural environment.*

Policies:

(4) Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water recharge areas, distinctive land forms, and existing vegetation.

(6) Design surface drainage and flood control systems in a manner which will help preserve their natural settings.

(7) Protect the natural environment from damaging levels of air, water, and noise pollution.

(8) Protect plants, birds, and other animals that are unique to the State of Hawaii and the Island of O'ahu.

Discussion: The project is in accordance with the City and County's goals for the Natural Environment as outlined above. The project gives due consideration to natural features of the site and the surrounding area during the site design and the creation of this Environmental Assessment. Site design features, such as surface drainage and flood control systems, take into consideration the impacts to the natural setting and are designed to limit or mitigate against adverse impacts. Best management practices will be followed during the implementation of the proposed project to ensure no impacts to plants, birds, and other animals unique to the Island of O'ahu and the State of Hawai'i.

IV. Housing

Objective A: *To provide decent housing for all the people of O'ahu at prices they can afford.*

Policies:

(3) Encourage innovative residential development, which will result in lower costs, added convenience and privacy, and the more efficient use of streets and utilities.

(8) Encourage and participate in joint public-private development of low- and moderate- income housing.

(10) Promote the construction of affordable dwellings, which take advantage of O'ahu's year-round moderate climate.

(12) Encourage the production and maintenance of affordable rental housing.

Objective C: *To provide the people of Oʻahu with a choice of living environments which are reasonably close to employment, recreation, and commercial centers and which are adequately served by public utilities.*

Policies:

(3) Encourage residential development near employment centers.

(4) Encourage residential development in areas where existing roads, utilities, and other community facilities are not being used to capacity.

Discussion: The Whitmore Community Food Hub may work with other State agencies responsible for residential development to include affordable workforce rental housing to support individuals working at the processing facilities and local farmers. These units will serve to increase the living choices of the individuals working in Wahiawā or in the central plain and possibly reducing commuting times and carbon emissions.

VII. Physical Development and Urban Design

Objective A: *To coordinate changes in the physical environment of Oʻahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they will be located.*

Policies:

(2) Coordinate the location and timing of new development with the availability of adequate water supply, sewage treatment, drainage, transportation, and public safety facilities.

(7) Locate new industries and new commercial areas so that they will be well related to their markets and suppliers, and to residential areas and transportation facilities.

(8) Locate community facilities on sites that will be convenient to the people they are intended to serve.

Objective D: *To maintain those development characteristics in the urban-fringe and rural areas which make them desirable places to live.*

(1) Develop and maintain urban-fringe areas as predominantly residential areas characterized by generally low rise, low density development which may include significant levels of retail and service commercial uses as well as satellite institutional and public uses geared to serving the needs of households.

(2) Coordinate plans for developments within the Ewa and Central O'ahu urban-fringe areas with the State and Federal governments and with the sugar, pineapple, and other emerging agricultural industries.

(4) Maintain rural areas as areas which are intended to provide environments supportive of lifestyle choices which are dependent on the availability of land suitable for small to moderate size agricultural pursuits, a relatively open and scenic setting, and/or a small town, country atmosphere consisting of communities which are small in size, very low density and low rise in character, and may contain a mixture of uses.

Discussion: The Whitmore Community Food Hub meets the abovementioned objectives outlined in the Physical Development and Urban Design section of the O'ahu General Plan primarily by proposing the facility in a convenient location, ensuring the development is able to be adequately serviced by existing infrastructure and utilities, and maintaining rural areas by encouraging the productive use of agricultural lands. The food hub aims to make agricultural production a less costly endeavor by spreading out the production costs for small diversified farmers and facilitating the movement of processed goods to market. Revitalizing the agricultural industry in this way will make farming more attractive and thereby preserve this land use in the Wahiawā area.

VIII. Public Safety

Objective B: *To protect the people of O'ahu and their property against natural disasters and other emergencies, traffic and fire hazards, and unsafe conditions.*

Policies:

(6) Reduce hazardous traffic conditions.

(7) Provide adequate fire protection and effective fire prevention programs.

(9) Design safe and secure public buildings.

IX. Health and Education

Objective A: *To protect the health of the people of O'ahu.*

Policies:

(3) Coordinate City and County health codes and other regulations with State and Federal health codes to facilitate the enforcement of air-, water-, and noise-pollution controls.

Discussion: The Whitmore Community Food Hub will be designed in accordance with all City and County of Honolulu health and building codes to ensure the safe and healthful design of public buildings and facilities.

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5.3.2 Central O‘ahu Sustainable Communities Plan

The Central O‘ahu Sustainable Communities Plan (COSCP) is one of eight community-oriented plans written to guide public policy, investment and decision making while taking into consideration the specific conditions and community values of the region. The document therefore provides direction for future growth, the economy, and social and environmental decisions throughout Central O‘ahu. During the pre-Assessment consultation process, comments from the City and County of Honolulu, Department of Planning and Permitting included” “A comparison of the project to the policies and guidelines of the current Central Oahu Sustainable Communities Plan (COSCP) and the proposed revised COSCP pursuant to Bill 75 (2017).” . Additionally during the pre-Assessment consultation process, the Wahiawā-Whitmore Village Neighborhood Board No. 26 wrote:

> *“7. How does this proposed plan fit in with the policies and guidelines of the Central Oahu Sustainable Communities Plan?’*

The following objectives and policies of the COSCP are applicable to the Whitmore Community Food Hub.

3.1 Open Space Preservation and Development

Provide long range protection for diversified agriculture and pineapple on lands outside the Urban Community Boundary and for two agricultural areas located inside the Urban Community Boundary.

3.1.4.4 Agricultural Areas

- *Facilities necessary to support intensive cultivation of arable agricultural lands should be permitted*
- *Residential use should be permitted only to the extent that it is accessory to the agricultural use. Where several dwellings are planned as part of an agricultural use, they should be sited and clustered to avoid the use of more productive agricultural lands and to reduce infrastructure costs.*
- *Buildings and other facilities that are accessory to an agricultural operation should be designed and located to minimize impact on nearby urban areas and roadways.*

3.6 Wahiawā Town

3.6.1.1 Maintain and Enhance Wahiawā’s Plantation Heritage and Rural, Small-Town Atmosphere

3.6.1.2 Enhance Wahiawā’s Role as a “Gateway” Between Town and Country

Discussion: The proposed project meets the stated goals of the Central Oʻahu Sustainable Communities Plan by focusing on the revitalization of Wahiawā and protecting agricultural resources. The project will aid in the retention of prime and unique agricultural lands and encourage economic development to meet the needs of Wahiawā residents and community members.

5.3.3 Wahiawā Urban Design Guidelines

The Wahiawā Urban Design Plan provides guidance on the urban design of new and existing developments to retain the unique history and architecture of the area, retain the character that is distinctive to other towns on Oahu and to improve the image of Wahiawā. The plan encompasses the business-zoned lands in the town, most of which are along Kamehameha Highway, California and Kilani Avenue, and North Cane Street. The Urban Design Plan boundaries extend from the Wilson Bridge to just south of the Karsten Thot Bridge on Kamehameha Highway, eastward between California and Kilani Avenue until the Wahiawā Botanical Garden, and westward until Kaala Elementary School.

The goal of the urban design plan is to:

(1) Maintain and enhance Wahiawā's plantation heritage and rural small-town atmosphere;
(2) Enhance Wahiawā's role as a 'gateway' between town and country;
(3) Nurture pride among residents of Wahiawā for their town;
(4) Enhance the town core as a setting for social, civic, and commercial interactions;
    a. Encourage Oahu residents to rediscover what Wahiawā has to offer
    b. Encourage more visitors to stop and examine what Wahiawā has to offer;
(5) Continue to serve the needs of military personnel

The Whitmore Community Food Hub is outside of the Urban Design Plan boundaries, however, at the request of Senator Dela Cruz's office, below is an analysis of the project in relation to the goals outlined in the plan.

Streetscapes of Wahiawā

The plan provides guidance on the enhancement of streetscapes to reinforce Wahiawā's unique sense of identity. The Whitmore Community Food Hub proposes to add a pedestrian path along the edge of the property and along Whitmore Avenue that accommodates pedestrians. Applicable improvements could include street trees, theme street lighting, and enhanced sidewalk paving on the property. The provision of sheltered bus stops and encouraging the planting of more trees along the sides and rear of the property may also be considered.

Building Character / Redevelopment Potential

The plan provides guidance on the design of building facades to reflect the plantation heritage of Wahiawā. The project represents a redevelopment effort which provides the opportunity to enhance the plantation character of the town. The project proposes to implement the following recommendations: to promote the restoration of buildings reminiscent of Wahiawā's plantation heritage by retaining and refurbishing existing Dole operational buildings.

5.3.4 Revised Ordinances of Honolulu (ROH)

5.3.4.1 ROH Chapter 14 Section 33 - Compete Streets Ordinance

ROH 14-33, enacted by Bill 26 Ordinance 12-15, implements the provisions of section 264-20.5, HRS by establishing a Complete Streets policy for the City and County of Honolulu. The policy objective is to encourage the development of transportation facilities or projects that are planned, designed, operated, and maintained to provide safe mobility for all users. The City and County of Honolulu, Department of Transportation Services provided the following comment during the pre-Assessment consultation process:

> *"The DEA should contain further discussion of compliance with County and State Complete Streets policies, pursuant to Act 54, Session Laws of Hawaii 2009, HRS 264-20.5 and ROH 12-15. The DEA should elaborate on how it will comply with Complete Streets policies, including specific adherence to the following key Complete Streets principles: safety, Context Sensitive Solutions, accessibility and mobility for all, use and comfort of all users, consistency of design guidelines and standards, energy efficiency, and health and green infrastructure."*

The Whitmore Community Food Hub proposes to incorporate a multi-way streetscape which will serve a range of travel speeds and will be in compliance with the following stated complete streets principles:

(1) **Improve safety**

Whitmore Avenue currently lacks basic pedestrian facilities, such as sidewalks, which does not encourage alternative modes of transport and does not support safe pedestrian travel. The proposed pedestrian path is planned to accommodate bicycles and pedestrians within the project site. The proposed design favors public access throughout the Whitmore Food Hub and encourages walking to adjacent public spaces such as Kahi Kani Park and Whitmore Community Park.

(2) **Apply a context sensitive solution process that integrates community context and the surrounding environment, including land use**

The proposed streetscape design will integrate the pedestrian pathway on the food hub property to create public space.

(3) **Protect and promote accessibility and mobility for all**

Planning for alternative modes of transportation and public spaces promotes greater accessibility for a wide range of ages and physical abilities. The project endeavors to provide facilities and open spaces that allow for greater accessibility for all community members.

(4) **Improve energy efficiency in travel and mitigate vehicle emissions by providing non-motorized transportation options**

By incorporating a space for safe pedestrian and bicycle travel, the project also endeavors to promote the use of the bus. There is a bus stop on the corner of Whitmore Avenue and Kamehameha Avenue, just west of the project area. If better facilities were provided to access the bus stop on this corner, it is believed that more community members, particularly those who live in the adjacent Whitmore Community, will be more likely to use the bus.

(7) **Build partnerships with stakeholders and organize statewide**

The Agribusiness Development Corporation has engaged with State and County agencies, local businesses, and community members throughout the design and planning phases of the project. The project anticipates continuing the build relationships and engage in public-private partnerships to ensure the successful implementation of the project, including the multi-way street concepts.

5.3.4.2 ROH Chapter 22 – Subdivision of Land

ROH Chapter 22 establishes rules and regulations regarding the subdivision of land. Of relevance is the Park Dedication Ordinance which specifies that the minimum park land area required is 110 square feet (or equivalent in land, cash and/or improvements – either on-site or at an existing park) for each multi-family housing unit.

Discussion: Regarding ROH Chapter 22, it is possible that the site can satisfy the land area requirements (110 square feet x 100 units = 11,000 square feet or 0.25 acre) on-site or since the proposed workforce housing will be affordable rentals, the developer of the housing units will request exemption from the requirements of the Park Dedication Ordinance through the HRS 201H process.

5.3.4.3 ROH Chapter 21 - Land Use Ordinance

The ROH Chapter 21 Land Use Ordinance (LUO) Code establishes zoning districts, permitted uses, and development standards within the zoning districts. The entire project site is zoned AG-1 Restricted Agricultural District.

Discussion:

During the pre-Assessment consultation period, the State Office of Planning wrote:

> *"…the Draft EA should clearly delineate the proposed siting of uses with respect to the underlying State land use district and City and County of Honolulu (City) zoning, the acreage of the area proposed for various uses with respect to the underlying districts, and discuss the conformity of proposed uses to those allowed in the respective underlying districts. We recommend consultation with the City Department of Planning and Permitting regarding any potential use, entitlement, and permitting issues…"*

Based on the above comment, a meeting with DPP was held on November 9, 2018. At the meeting, ADC Director James Nakatani provided the vision for the proposed Food Hub project (primarily to provide food safety processing services to smaller farmers of former Galbraith Estate lands and other nearby lands), but also noted that both food safety requirements and technology are ever-evolving. As a result of the meeting, DPP staff present had a better understanding of how the proposed uses may be permitted under HRS Chapter 205, Hawaii Revised Statutes, as well as under ROH Chapter 21. Regarding ROH Chapter 21, since the proposed uses would fall into the category of "Public uses and structures" ADC is asserting that the proposed Whitmore Community Food Hub would be a permitted use within the AG-1 Restricted Agricultural zoning district.

5.4 MAJOR APPROVALS AND PERMITS

A listing of anticipated permits and approvals required for the Project is presented below:

Table 5: Approvals and Permits

Permit/Approval	Responsible Agency
Chapter 343, HRS Compliance	Office of Environmental Quality Control
National Pollutant Discharge Elimination System (NPDES) Permit Construction Noise Permit	State Department of Health
Industrial Wastewater Discharge Permit	City and County of Honolulu Department of Environmental Services
Building Permit	City and County of Honolulu, Department of Planning and Permitting
Park Dedication	
Chapter 201H, HRS Approval	
Sewer Connection Approval	
Grading Permit	

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6 ALTERNATIVES CONSIDERED

This section identifies and evaluates a range of alternatives that could meet the objectives of the action (Section 2.1.2) and possibly avoid, reduce, or minimize adverse environmental effects. The reference point to compare alternatives is the "No Action" alternative.

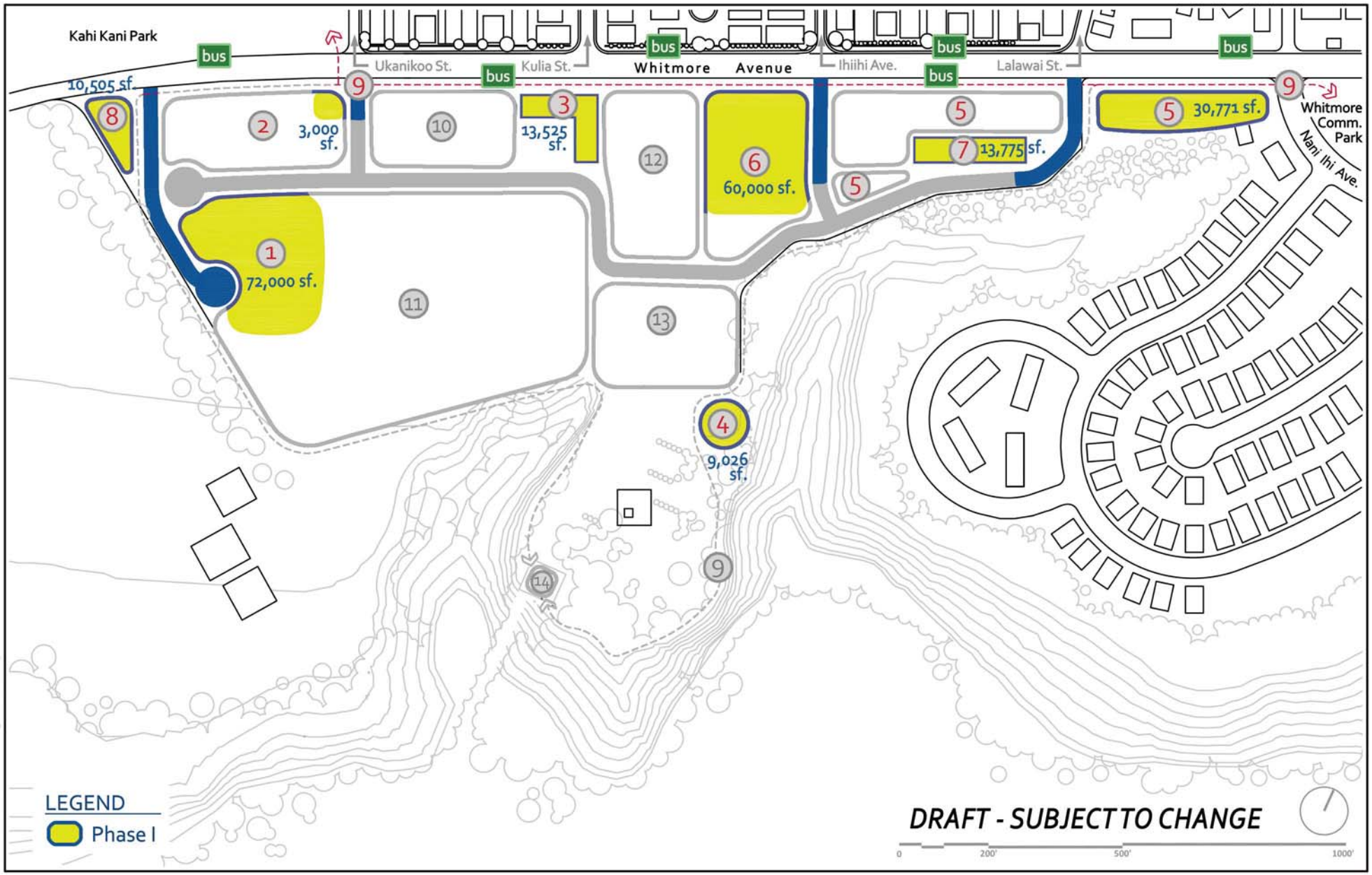
6.1 NO ACTION ALTERNATIVE

Under the "No Action" alternative, the Whitmore Community Food Hub would not be built and current farmers in the area would continue to bear the costs of processing their yields individually. The main objective of the food hub is to provide infrastructure that lowers the cost of processing and distributing food crops and thereby supporting smaller, more diversified agricultural production. The 'No Action' alternative would therefore prolong the trend of increased agricultural production costs and continue to stagnate growth in the agricultural industry. No new affordable agricultural workforce housing, fresh produce markets, or public spaces would be added to the existing Wahiawā/ Whitmore communities.

The "No Action" alternative would not achieve the objectives of the stated in the Oʻahu General Plan nor the Central Oʻahu Sustainable Communities Plan. The "No Action" alternative would not meet the objectives of the action and result in the majority of the site being under-utilized; therefore this alternative has been eliminated.

6.2 ALTERNATIVE 1

The Whitmore Community Food Hub has been designed to grow in phases as demand increases. Alternatively, the facility can remain as a phase I development and function as originally envisioned. The research greenhouse and office space, collectively known as the 'Research and Innovation Hub' would be constructed at 22,360 square feet. The food hub and warehouse would be constructed for a total of 72,000 ft. building footprint. The water storage tank, logistics yard and onsite wastewater facilities would also be constructed. The public spaces, rental housing units and other planned amenities would not be implemented.



DRAFT 11/09/2018

Whitmore Food Hub Conceptual Master Plan

1. Food Hub and Warehouse
2. Farmer's Market / Visitor Parking
3. Existing Machine Shop - Renovated
4. Water Storage Tanks and Treatment Ponds
5. Research and Innovation Node
6. Anchor Tenant Food Processing
7. Existing Outdoor Shed - Renovated
8. Whitmore Food Hub Entry Feature
9. Separate Pedestrian and Bicycle Path & Painted Crosswalks
10. Food Hub Visitor Center
11. Logistics Yard
12. Tenant Food Producer
13. Workforce Housing / Parking
14. Kaukonahua Stream Overlook

Figure 13:
Implementation of Phase I

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation O'ahu

North

PBR HAWAII & ASSOCIATES, INC.

Source: The University of Arkansas Community Design Center, University of Arkansas Office for Sustainability, University of Arkansas Resiliency Center, 2017. Agribusiness Development Corporation, 2017.
Disclaimer: This Graphic has been prepared for general Planning purposes only and should not be used for boundary Interpretations or other spatial analysis beyond the limitations of the data.

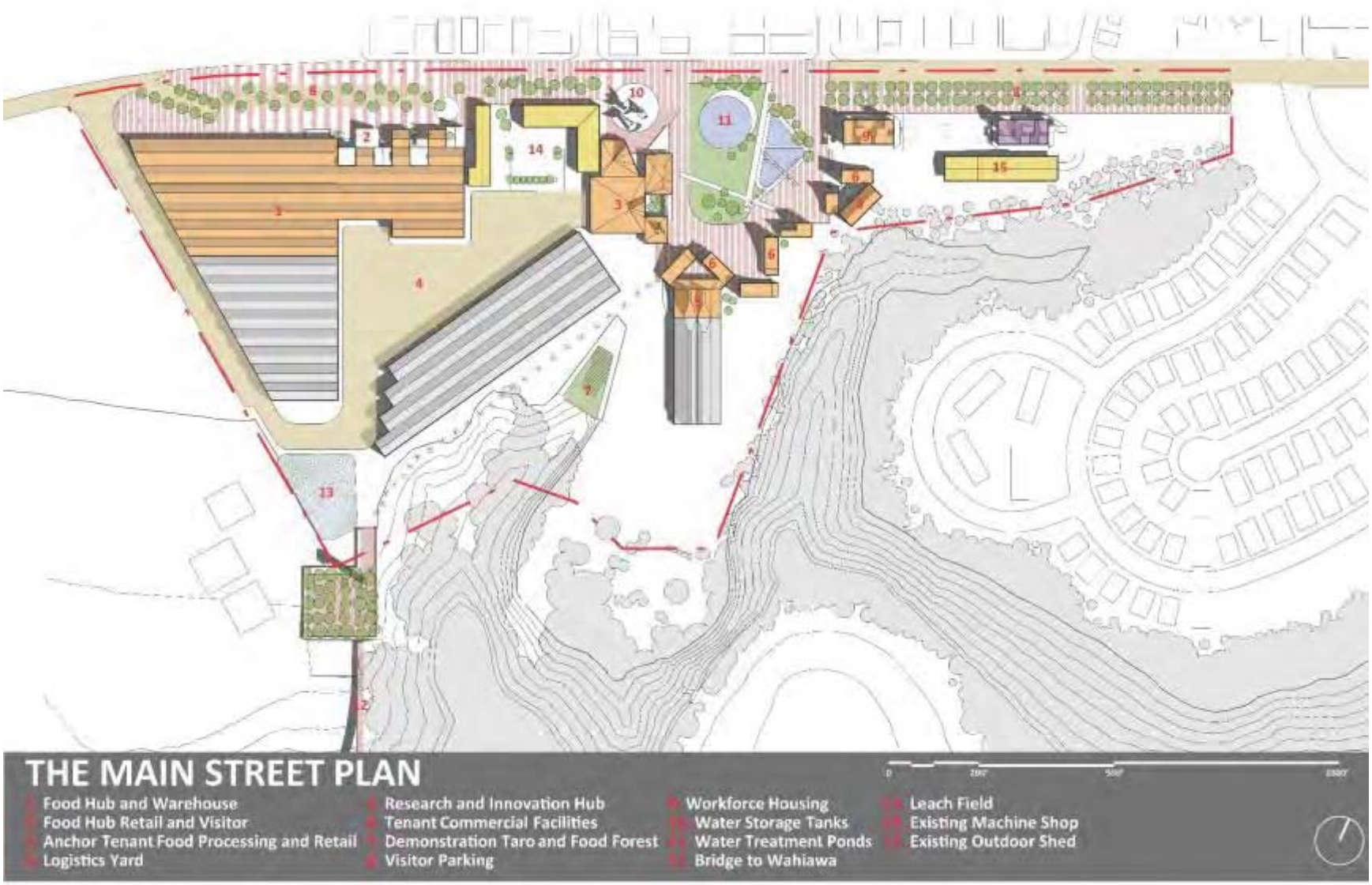
6.3 ALTERNATIVE 2

Early in the concept phase of the project, the design team presented the Main Street Plan and the Village Green Plan development alternatives based on the mix of amenities, facilities, and potential development layouts. The proposed Whitmore Community Food Hub is a mix of the Main Street (Whitmore Avenue) and Village Green schemes and, therefore, the Whitmore Community Food Hub is recommended over the following alternative designs.

The Main Street Plan – The Main Street Plan features street-scaled buildings and public spaces development along Whitmore Avenue, upgrading this segment of the corridor to a mixed-use neighborhood commercial street. The food hub is configured as back-of-house space behind public liner buildings and spaces on Whitmore Avenue. The food hub is serviced by a centralized logistics court with controlled access on the site's west end. Implementation of Phase I daylights the fenced-in site with new public frontages and redesign of Whitmore Avenue as a neighborhood commercial street. The plan encompasses various scaled buildings with familiar typologies to accommodate various functions in place of one large structure. The plan is designed like a campus allowing for easy and incremental growth. Phase II of the Main Street Plan would introduce housing, tenant commercial facilities, and additional public landscapes. Phase III of the Main Street Plan would complete build-out of the Food Hub and logistics yard totaling 400,000 square feet.

Village Green Plan – The Village Green Plan concentrates public space frontage around a central lawn with an arcade connecting retail and tenant processing spaces. The food hub aggregates food production and retail functions into a big box, which would be the most efficient configuration. The food hub is serviced by a perimeter logistics yard on the east end of the site, opposite the public retail areas toward the east end. Phase I of the Village Green Plan concentrates public frontages and visitor arrival around a village green. The east side of the Green is populated with smaller scale neighborhood functions like housing and commercial tenant space including the Innovation Hub, which is incorporated as a ground floor function of the housing complex. Phase II of the Village Green Plan introduces further visitor amenities to enhance the cultural tourism experience and town connection as the Food Hub experiences success. Swing space in the big box can be adapted to satisfy new retail tenants and diverse food experiences. The plan uses campus-like landscapes in the food and water reclamation gardens to establish identity and create a great visitor experience. Phase III of the Village Green Plan completes build-out of the Food Hub and logistics yard at 360,000 square feet.

ARCHICAD EDUCATION VERSION



ARCHICAD EDUCATION VERSION



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7 FINDINGS, SUPPORTING REASONS AND ANTICIPATED DETERMINATION

To determine whether the Whitmore Community Food Hub may have a significant impact on the physical and human environment, all phases and expected consequences of the proposed project have been evaluated, including potential primary, secondary, short-range, long-range, and cumulative impacts. Based on this evaluation, it is anticipated that the Determining Agency (the State of Hawaii Department of Agriculture, Agribusiness Development Corporation) will issue a Finding of No Significant Impact (FONSI). The supporting rationale for this finding is presented in this chapter.

7.1 SIGNIFICANCE CRITERIA

The discussion below evaluates the significance of the Project's impacts based upon the Significance Criteria set forth in Hawai'i Administrative Rules section 11-200-12.

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

Discussion: The Whitmore Community Food Hub is sited on land that is already heavily modified (former Dole Company Operation Facility and is currently occupied by the Whitmore Agricultural Tech Park) and will not result in the loss or destruction of any natural or cultural resources.

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

Discussion: The Proposed Project will not curtail the range of beneficial uses of the project site (which has been in agricultural support-type use for many years). The Whitmore Community Food Hub expands the agricultural support functions of the existing site.

(3) Conflicts with the State's long term environmental policies or goals and guidelines as expressed in Chapter 344, HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders;

Discussion: Section 344-3 Environmental Policy was reviewed and it appears that the proposed project is consistent with the stated policies and guidelines, except for Section 344-3 (2) (A) and 344-4 (1), which refer to "setting population limits" and "limit population."

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

Discussion: The Whitmore Community Food Hub proposes a number of facilities and spaces that will support the economic and social vitality of Wahiawā. The core food hub processing facility will support small local farmers by providing a space where they can aggregate, process, store, market and distribute their products. The rental housing and public spaces will support the need for affordable agricultural workforce housing while also creating a more walkable, diverse use neighborhood. Because the food hub is located within a designated Enterprise Zone, the lessee(s) of the project can take advantage of beneficial tax incentives while growing and developing a more robust agricultural community.

(5) Substantially affects public health;

Discussion: The proposed project will be compliant with the Food Safety Modernization Act (FSMA), which regulates how foods are grown, harvested and processed. Compliance with this federal standard will ensure consumers are protected and food is processed appropriately. The facility will be a place where the local community can buy fresh fruits and vegetables, increasing access to affordable fresh produce.

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

Discussion: The affordable agricultural workforce rental housing component of the proposed project (100 units) represents less than 2 percent of the total number of housing units in Wahiawā. At 2 persons per unit, the housing component of the Whitmore Community Food Hub would equal to less than 1 percent of the total population of Wahiawā. While there will be an increase: in traffic, water and electrical demand, wastewater and solid waste generated, park usage and an occasional and unavoidable demand for police and emergency services, the impacts would be not be substantial.

(7) Involves a substantial degradation of environmental quality;

Discussion: During construction, there is a potential for air, water and noise impacts, but these impacts would be of a relatively short duration (compared to the life of the project) and various measures are available to mitigate impacts.

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

Discussion: The project site has already been substantially altered and urbanized, so even with known plans for the return of agricultural practice in the immediate area, cumulatively, there should be little effect on the environment or involve a commitment for larger actions.

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

Discussion: The Whitmore Community Food Hub is not anticipated to have a significant negative impact any Federal or State of Hawai'i listed Threatened, Endangered, or Candidate plant or animal species. No endangered or threatened plant species nor plant habitats were found during the survey. The habitat within the project area is not suitable for native O'ahu forest birds nor native seabirds.

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

Discussion: As previously noted, during construction, there is a potential for air, water and noise impacts, but these impacts would be of a relatively short duration (compared to the life of the project) and various measures are available to mitigate impacts.

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

Discussion: The proposed project is not located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

(12) Substantially affects scenic vistas and view planes identified in County or State plans or studies; or,

Discussion: Scenic vistas listed in the Wahiawā Urban Design Plan include: (1) Lake Wilson from Kamehameha Highway at the H-2 Freeway off-ramp as you approach Wilson Bridge; (2) Lake Wilson from Kamehameha Highway at the Karsten Thot Bridge. The Whitmore Community Food Hub does not affect either scenic vista.

(13) Requires substantial energy consumption.

Discussion: The proposed land use does not require substantial energy consumption. According to the National Academies of Science, Engineering and Medicine (NAS, 2018),

> ***The United States uses 28% of its total energy each year to move people and goods*** *from one place to another. The transportation sector includes many modes, from personal vehicles and large trucks to public transportation (buses, trains) to airplanes, freight trains, ships and barges, and pipelines. By far the largest share is consumed by cars, light trucks, and motorcycles—about 58% in 2013, followed by other trucks (23%), aircraft (8%), boats and ships (4%), and trains and buses (3%). Pipelines account for 4%.*

The Whitmore Community Food Hub is anticipated to reduce personal vehicle trips by each farmer by providing a consolidated area for processing their crops, and instead of each farmer delivering their processed crops to individual customers, stores, restaurants, etc., the food hub would provide a consolidated area for food wholesalers to pick up fresh produce (after making deliveries around the island).

7.2 ANTICIPATED DETERMINATION

Pursuant to Chapter 343, HRS, it is anticipated the Determining Agency will issue a Finding of No Significant Impact (FONSI) for this environmental assessment. This finding is founded on the basis of impacts and mitigation measures examined in this document, public comments received during the pre-consultation and public review phases, and analyzed under the above criteria.

8 CONSULTATION

In the course of designing the Whitmore Community Food Hub, stakeholder meetings were held to ensure that the facility met the goals, needs, and objectives of the surrounding community. As the next phase of planning for the Whitmore Community Food Hub continues, comments have been solicited from agencies and community members that may have an interest in the development of the facility.

8.1 PRE-ASSESSMENT CONSULTATION

Pre-consultation was conducted prior to preparation of the Draft EA. The purpose of the pre-consultation period is to consult with individuals, community organizations, private groups, and government agencies with technical expertise, or an interest or will be affected by the proposed action. This process is part of the scoping process for the Draft EA. Comments and input received during this period are used to identify environmental issues and concerns to be addressed in the Draft EA, which in turn undergoes a 30-day public comment period. The comments received and corresponding responses are reproduced in Appendix G.

Table 6: Pre-consultation

COUNTY OF HONOLULU	Pre-Consultation Sent	Comment Dated
Board of Water Supply	X	02/04/2019
Department of Community Services	X	10/04/2018
Department of Customer Services	X	
Department of Design and Construction	X	09/24/2018
Department of Emergency Services	X	
Department of Enterprise Services	X	
Department of Environmental Services	X	09/14/2018
Department of Facility Maintenance	X	10/03/2018
Department of Land Management	X	09/12/2018
Department of Parks and Recreation	X	09/17/2018
Department of Planning and Permitting	X	10/12/2018
Department of Transportation Services	X	10/05/2018
Honolulu Fire Department	X	09/21/2018
Police Department	X	
ELECTED OFFICIALS		
State Senator Dela Cruz	X	
State Representative Learmont	X	10/11/2018
Council Member Ernest Martin	X	
STATE		
DBEDT - Energy Division	X	
DBEDT - Land Use Commission	X	
DBEDT - Office of Planning	X	09/28/2018
Department of Accounting and General Services	X	09/25/2018
Department of Agriculture	X	10/05/2018

Department of Business, Economic Development & Tourism	X	
Department of Defense	X	09/12/2018
Department of Education	X	
Department of Hawaiian Home Lands	X	
Department of Health	X	
Department of Health - Clean Air Branch	X	
Department of Health - Environmental Planning Office	X	
Department of Human Services	X	09/21/2018
Department of Labor and Industrial Relations	X	
Department of Land and Natural Resources	X	10/03/2018
Department of the Attorney General	X	
Department of Transportation	X	
Department of Transportation - Highways	X	
DLNR - Historic Preservation Division	X	
Hawai'i Housing Finance and Development Corporation	X	
Hawai'i Community Development Authority	X	
Office of Environmental Quality Control	X	
Office of Hawaiian Affairs	X	
UH Water Resources Research Center	X	09/11/2018
FEDERAL		
U.S. Army Corps of Engineers	X	
U.S. Fish and Wildlife Service	X	09/26/2018
U.S. Food and Drug Administration	X	
Environmental Protection Agency	X	
Department of Agriculture NRCS	X	
DOI Geological Survey - Pacific Islands Water Science Center	X	
Naval Computer and Telecommunications Area Master Station Pacific	X	2/07/2019
UTILITIES		
Hawaiian Electric Company, Inc.	X	
Spectrum	X	09/27/2018
Hawaiian Telecom	X	
CITIZEN GROUPS, INDIVIDULAS, CONSULTED PARTIES		
Wahiawā-Whitmore Village Neighborhood Board No. 26	X	10/18/2018
Green World Coffee Farm	X	
Dole Plantation	X	
Helemano Plantation	X	
Helemano Farms LLC	X	
Wahiawā Community Based Development Organization (WCBDO) (Wahiawā Fresh!)		10/24/2018

8.2 AGENCY & COMMUNITY MEETINGS

The food hub complex is planned to support small farmers leasing acres on the Galbraith lands. In addition to supporting the processing needs of diversified agricultural producers, the food hub seeks the input and support of the community that would benefit from the jobs as a result of the facilities. Therefore, the development of the Whitmore Community Food Hub was the result of several stakeholder engagement meetings. Workshops were held on September of 2016 and March of 2017, with the following agencies and organizations:

- Hawai‘i Department of Agriculture
- Hawai‘i Housing Finance Development Corporation
- Hawai’i Public Housing Authority
- Department of Business, Economic Development, and Tourism
- Foreign Trade Zone
- High Technology Development Corporation
- Pineapple Crate
- Department of Environmental Services
- Department of Planning and Permitting
- Leilehua Alumni Community Association; Dept. of Education
- Wahiawā Community Business Association
- Wahiawā Community Based Development Organization
- Whitmore Economic Development Group
- CTAHR Poamoho Research Station
- Whitmore Project Tenants

During the week of September 14, 2016, representatives from the University of Arkansas OFS and CDC travelled to O'ahu to meet with stakeholders and to visit agricultural production sites in the community. A briefing was delivered to these stakeholders exploring the concepts behind the Whitmore Food Hub, including a background, approach, and potential planning options and components involved. The goal of these meetings was to inform stakeholders, as well as explore and give voice to their opinions and feedback in developing the local agricultural production community.

The second workshop was held the week of March 6, 2017. Representatives of the OFS and CDC had at least one more meeting with all the key stakeholders previously listed. During the workshop, a handout was presented to the stakeholder that contained important information about the Master Plan, as well as a survey that allowed the stakeholders to give their input on different design elements. Collected responses included suggestions, as well as things the stakeholders did and did not like about the design ideas that were presented. There were several suggestions that were made, such as adding more housing along Whitmore Avenue and the ridge for market housing. It was also suggested that the designs increase density and minimize building footprint so that the food hub does not become a ghost town during slow hours. Two building design suggestions were adding photovoltaics to all south facing roofs, and incorporating a lot of north facing windows for natural daylight.

Subsequent to these workshops, a community meeting was held on October 12, 2018 at the Helemano Elementary School cafeteria. During the pre-Assessment consultation period, State Representative District 46, Lei Learmont wrote: "If there are changes to the July 2017 Master Plan, will the community be consulted." Since both food safety requirements and technology are ever-evolving, the site plan (Figure 6) was revised to show the locations of envisioned land uses and their general location. There are no longer plans to convert Whitmore Avenue into either a "shared street" or "pedestrian mall." The public review period for this EA is a venue for the community to provide written consultation comments.

On October 15, the Wahiawā-Whitmore Village Neighborhood Board No. 26 met. ADC staff Ken Nakamoto who made a presentation on the proposed Whitmore Community Food Hub and a "30-Day Notice to Whitmore Residents". It was reported that the "30 Day Notice to Whitmore Residents" pertains to the following: While installing "no trespassing" signs along its property line in Whitmore, ADC encountered numerous encroachments on State property preventing access to the property line behind the residences along Circle Mauka Street and Circle Mauka Place, Following instructions from the State of Hawaii Attorney General's Office, ADC sent a notification to the homeowners on Monday, August 13, 2018 to inform them that they have 30 days to claim and remove any of the personal property found on State property.

Questions, comments, and concerns followed, but some are related to "30 Day Notice to Whitmore Residents" and not necessarily related to the proposed "Food Hub."

1. Legality of Purchase: A community member asked if the purchase of lands by ACD was legal and also asked that presentations four (4) and five (5) on the agenda be deferred until there is more information on the matters.

2. Impact of Food Hub: A community member asked what the expected traffic, pedestrian and visitor volume, and the impact of the Food Hub would be to the Whitmore community and Naval Computer and Telecommunications Area Master Station (NCTAM). A community member raised concerns with an increase in traffic in the area and Whitmore becoming a tourist attraction like Haleiwa. A community member asked what impact the Food Hub will have on the neighboring Dole Plantation. A community member asked what safety measures will be taken regarding security, noise levels, wastewater, and smells. A community member asked what types of machinery will be used and what environmental impacts this may have on the area.

3. Policies: A community member asked if this proposed plan fits in with the policies and guidelines of the Central Oahu Sustainable Communities Plan.

4. Water Storage: A community member asked how large water storage tanks will be, and what will the security measures be to assure no flooding.

5. Property Owners: A community member raised concerns with the State forcing residents to remove property from lands that they been on for over 30 years.

6. Hawaiian Lands: A community member raised concerns with Hawaiian lands that have been forcefully taken by the government.

7. Environmental Impact Statement (EIS): A community member stated that a feasibility study and EIS should have been done prior to the purchase of the land and before asking residents to remove their property.

8. Purchase of Lands: A community member asked when ADC began purchasing land and what the reasons are for purchasing them. Nakamoto stated that ADC began purchasing lands in 2012. It started with the Galbraith Lands and it was for agricultural development.

9. Other Land: A community member stated that there is a lot of land elsewhere and asked why the land abutting to residential home is being used.

10. Non-Local Companies: A community member raised concerns with out of state companies and suggested that the State should use local companies and employees from the Wahiawā-Whitmore community.

11. Public Input: A community member stated that ADC should give the community an opportunity to voice their concerns and suggested a public meeting to talk with residents.

12. Permits: A community member asked if the State had the necessary permits purchase the land and ask residents to remove their property.

13. Audit: A community member stated that ADC should be audited to see where and if they have been lawfully spending their money.

14. Zoning: A community member asked if that area of Whitmore was designated as an Enterprise Zone.

15. Farming: A community member raised concerns with the use of pesticides. It was suggested that local farmers be utilized along with local products.

16. Native Hawaiian Plants: A community member stated that Native Hawaii plants be planted in the area.

17. Purchase of Lands: A community member raised concerns that the lands purchased by ADC was done illegally.

After the discussion on the proposed Food Hub, Neighborhood Board member Harvest made a motion that the Wahiawā-Whitmore Village Neighborhood Board No. 26 postpone a decision on the proposed Whitmore Food Hub. Harvest withdrew his motion.

Neighborhood Board member Francher moved and Neighborhood Board member Lormand seconded that the Wahiawā-Whitmore Village Neighborhood Board No. 26 include all concerns and comments from the community in the pre-assessment consultation for the proposed Whitmore Food Hub and that there is insufficient information from ADC for the Neighborhood Board to provide a reasonable response. The motion was adopted by Unanimous Consent of Neighborhood Board members present.

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APPENDIX A

Whitmore Community Food Hub Complex Plan



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Masterplan for

Whitmore Community Food Hub Complex

for

State of Hawai'i Agribusiness Development Corporation

Wahiawa, Hawai'i

July, 2017

University of Arkansas Community Design Center
+
University of Arkansas Office for Sustainability / University of Arkansas Resiliency Center


be resilient: build community around food!
A local food system centered around local growers requires
a missing middle scale of agricultural infrastructure
for shared product aggregation and processing.

Introduction:

Supporting Locally Produced Food

Project Synopsis

Food hubs are re-emerging as community-based supply chain infrastructure to support the processing of locally produced food. Large and small cites alike were historically served by local food hubs before large-scale agriculture eclipsed the primacy of locally produced food in feeding cities. Remnants of urban food hubs include now popular tourist attractions like South Street Seaport and Chelsea Market in New York City, Pike Place Market in Seattle, Eastern Market in Detroit, Reading Terminal Market in Philadelphia, and Faneuil Hall Marketplace in Boston. Now that communities are incorporating resilience in their policy and planning—including reassessments of the current provisioning of food—we have come to better understand unforeseen risks in the continent-scale food supply chain. Chronic stresses from food insecurity that undermine community well-being have also become more visible. Cultivation of local substitutions for imported food as well as expansion of crops grown locally for export have become important risk mitigation strategies in achieving greater food security. However, locally produced food requires regional-scaled infrastructure for small growers who typically do not have access facilities to aggregate, process, and distribute products to local consumers. The challenge to small growers will be further complicated by stringent regulations proposed under the Food Safety Modernization Act (FSMA), jeopardizing the ongoing viability of many small growers due to the costs of compliance. The dominance of continent-scale agriculture over the last eighty years has almost supplanted locally oriented food processing infrastructure, resulting in a "missing middle" agricultural infrastructure necessary to support local growers and legacy food systems. The lost knowledge and capacity from local models of fruit and vegetable processing is being recaptured with food hubs, loosely defined as regional aggregation, processing, and distribution centers for locally produced fruits and vegetables. The challenge in developing new food hubs, then, entails formulation of fitting business models and appropriate facility designs, all without comparable precedents and data to guide development decision making.

In Hawai`i additional challenges to small growers include high costs in land, labor, and energy, as well as limited access to water supply for irrigation. Even if there were robust interest in farming and an abundant agricultural workforce, public sector investment remains the best hope for developing the supply chain infrastructure necessary to overcome market and distribution chokeholds. While food hubs may sponsor a retail function, foods hubs are not farmer's markets as commonly perceived. Rather, food hubs are front-end supply chain venues for building wholesale relationships between diversified growers and institutional consumers.[1] They are market makers for locally produced food, providing for-profit services as well as nonmarket public goods. Food hubs centralize post-harvest services that lower input costs associated with processing, storing, and marketing/distributing locally produced food. Cooperative arrangements also raise the likelihood of implementing sustainable waste management to recycle agricultural waste streams. As community clearinghouses, food hubs leverage their public

1 Barham, James, Debra Tropp, Kathleen Enterline, Jeff Farbman, John Fisk, and Stacia Kiraly. *Regional Food Hub Resource Guide*, U.S. Department of Agriculture, Agricultural Marketing Service, April 2012.

good when overlapped with other community-based systems like workforce education and training, housing, allied business incubation, cultural tourism, energy, and urban design.

The Whitmore Food Hub Complex is planned to initially serve the processing needs of the central plain agricultural community surrounding Wahiawa, and possibly a larger footprint encompassing greater O`ahu. The following concept vision and master plan resulted from collaborative planning efforts among State of Hawai`i agencies, local governments, and civic organizations led by the Agribusiness Development Corporation (ADC) of the Hawai`i Department of Agriculture with the University of Arkansas. The master plan is a concept approach only and, as with all plans, will certainly change with additional design development and stakeholder feedback. The urban design vision supports development of a business plan, definition of project scope, and organization of multiple stakeholder participation in the project. Design development toward construction of site and buildings requires further technical architectural and engineering design services beyond the scope of this contract.

Stakeholders each hold important and sometimes conflicting interests in the development of the Food Hub. Both agreements and contestations among them informed the project team's planning and design approaches. First and foremost, the central plain agricultural community between Ewa and Haleiwa on O`ahu requires a fruit and vegetable food hub—primarily a logistics-oriented space—to pool services for the aggregation, processing, storage, marketing, and distribution of locally produced foods by small growers. More than half of all diversified crops grown statewide for local consumption are grown on O`ahu. Most of it is fresh produce encompassing 9,850 aces, according to the *Statewide Agricultural Land Use Baseline 2015*, released by the Hawai`i Department of Agriculture.[2] Area residents hold equally important interests in greater job creation, sustained economic development, and provision of affordable workforce housing. Still others in Wahiawa view the Food Hub Complex as an opportunity to create a mixed-use walkable neighborhood compelling to both tourists and local residents seeking engagement in food-related cultural activities. Accordingly, the Whitmore Food Hub Complex plan provides synergistic solutions responsive to these multivariate forces, integrating utility with culture and place.

The Whitmore Food Hub Complex

In their 2007 report, *Island of Hawai`i Whole System Project Phase I Report*, Rocky Mountain Institute authors Christina Page, Lionel Bony, and Laura Schewel outline three primary business opportunities for improving Hawai`i's agriculture and locally produced food consumption: "increasing production, developing support infrastructure, and expanding markets."[3] Food hubs fulfill the second category of developing support infrastructure, without which the other two recommendations could not succeed. Locally produced food and diversified agriculture are strategic risk mitigation strategies, cornerstone to community resilience that has become important among statewide policymakers. Resilience is the capacity of a system to thrive through disruptions and shocks exerted upon a system. Critical statewide, since 93 percent of Hawai`i's food is imported from global supply chains. Hawai`i's vulnerability is compounded by its situation as the remotest landmass on Earth. Not too long ago, Hawai`i's diverse landscape once fed a nation. It is the only state in the US covering all seven of Earth's terrestrial biomes—coastal strand, dry woodlands, tropical rainforest, mesic forests, deserts, subalpine grassland/shrubland, and alpine desert. Island ecosystems, however prolific, lack the network redundancy of continents. Therefore, the proposal recalls authors Jennifer Chirico and Gregory Farley appeal to once again "think like an island" in building statewide resilience, particularly through development of closed-loop systems.[4] Food hubs are necessary components in closing the loop on food since they incubate diversified food supply chains and a skilled agricultural workforce where neither existed before.

Keeping in mind that the Food Hub is essentially a large post-harvest facility—a big box warehouse—four principles guide the planning and design of the 34-acre Whitmore Food Hub Complex. **Logistics:** provide a Food Hub that meets the requirements of the Food Safety Modernization Act (FSMA). **Placemaking:** integrate logistical spaces of the Food Hub with surrounding neighborhoods through serial public spaces that sponsor multiple uses. **Connectivity:** connect the Food Hub and Whitmore Village to downtown Wahiawa. **Anchoring:** socialize the Food Hub's big boxes and tilt wall concrete construction through mixed uses and civic frontages. Ideally, the Food Hub will service all stages of the local food supply chain. The cooperative nature of food hubs encourages integrated resource management among tenants.

2 Melrose, Jeffrey, Ryan Peroy, and Sylvana Cares. *Statewide Agricultural Land Use Baseline 2015,* University of Hawai`i at Hilo Spatial Data Analysis & Visualization Research Lab and Hawai`i, Department of Agriculture, 2016.

3 Page, Christina, Lionel Bony, and Laura Schewel. *Island of Hawai`i Whole System Project Phase I Report*, Rocky Mountain Institute, March 2007.

4 Chirico, Jennifer, and Gregory S. Farley. *Thinking Like an Island: Navigating a Sustainable Future in Hawai`i*, University Of Hawai'i Press, 2015.

This involves the *upcycling* of tenant waste streams as inputs to feed another tenant's production processes, akin to the "green" economies of integrated energy districts.[5] The ideal food hub eliminates the concept of waste, otherwise difficult when tenants are scattered in separate facilities. Food hubs' aggregated economy of agricultural services and producers hold greater opportunity for implementing sustainable agricultural practices, otherwise untenable in a conventional market primarily focused on export commodity crops.

1 Logistics

Provide a Food Hub that meets the requirements of the Food Safety Modernization Act (FSMA).

The Whitmore Food Hub is designed to meet the science-based protocols of FSMA, a preemptive set of regulations elevating safety measures throughout the food system. FSMA elevates hazard analysis, preventive control throughout growing and production processes from farm to table, and health and safety controls in facility design and operations. Facility construction should be smooth with minimal articulation and joinery that prevents water and pest intrusions; resists mold, mildew and bacterial growth; and clad with an exterior skin resistant to the corrosive effects of salt. The facility should be durable and easy to clean through power washing. Therefore, we recommend tilt wall concrete construction, an investment-grade construction system common among large-scale facilities, reaching economy of scale after 5,000 sq ft. The flat site is amenable to this *in situ* construction system. We recommend an insulated panel sandwich to achieve the thermal performance necessary for food hubs. Tilt wall concrete systems optimize food safety in the context of local environmental stresses, including severe weather, earthquakes, high humidity, and corrosive conditions.

Tilt wall concrete construction—a low-tech *in situ* process—provides flexibility and modularity, allowing for systemic growth as processing/storage protocols and tenant needs change. Some tenants will likely require warehouse stacking rack systems, requiring high building eave heights of approximately 23 feet, while others will need cold storage. Tilt wall construction is affordable and expedient compared to other construction systems since it relies on poured walls leaned into place on their foundations, rather than a layered wall assemblage involving multiple trades. Tilt wall involves low-skilled labor, modulated formwork, and basic joinery without the need for premium finishes. Concrete walls are both exterior skin and load-bearing structure, which makes the system durable and easily compatible with steel frame structural systems that may be used for the interior support of roofs. Tilt wall construction is one of the most commonly used building systems worldwide, especially for high-performance logistics support functions throughout global supply chains.

Preliminary determinations show that 75,000 sq ft is the minimum operating size to create a self-sufficient Phase I central Food Hub, including Visitor Center/Retail that can be programmed independently of the operations wing. To prevent contamination or to contain its spread, FSMA necessitates the sorting of food product between incoming and outgoing streams with protected areas in between for washing/sorting, and processing/packaging. Visitor access to operations space is limited. Additional regulations may apply depending upon standards governing high risk foods and processing protocols. Build-out of the centralized facility can accommodate a maximum 375,000 sq ft with an additional 60,000 sq ft in satellite Tenant Food Producer Commercial Facilities.

The master plan stratifies circulation between spaces for the public and shipping/logistical functions. Public areas of Food Hub buildings front a signature Neighborhood Lawn designated for the center of the site, much like a village green. Public building frontages line the Neighborhood Lawn with porches, shade canopies, visitor centers, public gardens, and a proposed Retail Arcade/Market that screen large processing facilities. Opposite the Lawn, continuous Logistics Yards for trucks are tucked along the eastern and western edges of the site away from public view. These Yards for product handling and shipping, water treatment/storage, and waste management are accessed at discrete entrances from Whitmore Avenue. Food Hub structures then are the pivot points between public space and logistics space.

The Food Hub Complex serves a variety of business models. A centralized

5 McDonough, William, and Michael Braungart. *The Upcycle: Beyond Sustainability--Designing for Abundance*, North Point Press, 2013.

Food Hub facility for shared processing among small growers (perhaps a cooperative) is supplemented by satellite speculative Tenant Food Producer Commercial Facilities for specialty tenants. Prospective tenants include coffee roasters, breweries/distilleries, juicing plants, taro producers, and other heritage food producers who desire their own freestanding structures (and identity) to support proprietary operations and expand upon existing customer bases. Perhaps consider developing a local seed bank to ensure preservation of legacy plant species. The design challenge involves deriving a civic architectural expression from an industrial building technology like tilt wall construction that lacks an architectural and placemaking pedigree.

2 Placemaking

Integrate logistical spaces of the Food Hub with surrounding neighborhoods through serial public spaces that sponsor multiple uses.

Besides providing processing and distribution support for small growers, the Whitmore Food Hub Complex serves additional community needs in agricultural workforce housing, business and technology incubation, and cultural tourism. A major planning objective is to provide a distinctive public setting for these community systems reflective of Wahiawa's rural historic character. The success of these community systems' will be rooted in place-oriented development; places that will have to appeal to Wahiawa residents, entrepreneurs, and North Shore tourists alike, despite that 80 percent of the complex is devoted to logistical functions.

Accordingly, our urban design recommendation adopts a campus planning approach animated by a succession of various public landscapes linking the site's northern edge at Whitmore Avenue to the Kaukonahua Stream along the site's southern edge. Four primary spaces anchor Whitmore Village's new public concourse: the transformation of Whitmore Avenue into a multi-way street, a central Neighborhood Lawn, a Food Forest, and the Bridge over Kaukonahua Stream to downtown Wahiawa (Food Forest and Bridge discussed under Principle 3: Connectivity). This pedestrian/bicycle concourse connecting Whitmore Avenue to downtown Wahiawa is more than one-half mile in length. However, this is not the classic early 20th century main street development. Main streets are beloved spaces marking the center (and usually the founding space) of town. Understandably, some want to reproduce the iconicity of main street in new development. However, main streets were based on a small-scale retail economy, developed incrementally with fee simple small-lot commercial structures for individual merchants. Ground-level stores (typically 2,500-10,000 sq ft) supported equally modest residential and offices uses above, creating compact multiple-story streets. This vertical, and particularly urban, integration of uses served cities well before the adoption of single-use zoning rendered main street illegal—especially the universal house-over-shop formula that made downtowns livable and affordable. Conversely, the food hub is a warehouse economy needing the large-scale horizontal format of industrial processing and storage environments to support wholesale exchanges. Hence, the campus approach allows us to coherently negotiate large and uneven differences: big scale with small scale, residential functions with large assembly functions, and civic space with logistical space, through a diverse set of urban landscapes. The four landscapes of this public concourse sponsor their own compatible forms of civic expression equally as memorable and human-scaled as main street.

Whitmore Avenue as Multi-Way Street

Whitmore Avenue should be designed as a destination environment to serve the interests of both the community and the Food Hub Complex. Inspired by context-sensitive streets like Kamehameha Highway—particularly at Hale'iwa, the hub community of the North Shore tourist area—we recommend the existing Whitmore Avenue right-of-way along the Food Hub be reconfigured into a multi-way street. Multi-way streetscapes are laminated (layered) corridors, serving a range of travel speeds and modes in the same space. Designed more like gardened corridors or boulevards, multi-way streets accommodate slow automobile travel, bicycles, and pedestrian modes of movement without sacrificing commuter traffic-carrying capacity in the full right-of-way. The multi-way street recommendation entails integration of the public right-of-way with that of the Food Hub's property frontage to create a destination public space. Tree-lined lanes for slow trav-

el accommodate on-street parking, eliminating large and unsightly parking lots in favor of more town-oriented parking formats. Whitmore Avenue currently lacks basic pedestrian facilities like sidewalks despite the presence of neighborhoods. The corridor is an auto-dominant environment unsupportive of non-traffic uses like shopping, strolling, meeting, and dining that all great streets support. Multi-way streets allow pedestrians to claim the street space with the same authority as motorists through street design that compels motorists to slow down and behave socially. The proposed design favors more a series of landscaped rooms or plazas than a smooth corridor, the latter promotes high travel speeds regardless of posted limits. Thus, to change travel behavior and attendant perceptions of safety in a street: change its level of service.

Neighborhood Lawn

The Neighborhood Lawn is the heart of the Food Hub Complex and a civic anchor for Whitmore Village. While communities like Whitmore Village separate land uses through single-use zoning, the Neighborhood Lawn aggregates the Food Hub Complex's different land uses around its edges. Much in the spirit of a village green (commonly used in plantation planning among other planning traditions). The Lawn—the grand room comprising Whitmore Avenue's proposed series of rooms—couples Whitmore Avenue with the Food Forest and Bridge to downtown Wahiawa. The Lawn's central space overcomes limitations in traditional front-to-back urban orientations of main streets, since it accommodates public entrances from opposite sides—north and south—much like a campus. A receptive space by definition, the Neighborhood Lawn encourages the intensification of public uses, including arrival and orientation, housing, water treatment and storage, and formal as well as informal economies involving food trucks and produce stands. Akin to village greens and town squares, the Neighborhood Lawn typologically negotiates differences in scale, use, and architectural expression through shared building frontages (see more on this in Principle 4: Anchoring). Regardless of land use, we recommend that all buildings fronting the Neighborhood Lawn, even the Machine Shop and Food Hub structures, provide public frontages like canopies, porches, loggias, arcades, and courts compatible with great public spaces. Agnostic to use, such form-based coding requires the principal elevation of all buildings to qualitatively define public space, a criterion which single-use zoning fails to address.

Workforce Micro-Housing

What is good for the agricultural workforce in Hawai`i is good for agriculture. Whereas the production chokepoint for meat statewide is the cost of feed, for fruits and vegetables it is the cost and availability of labor.[6] Hawai`i is the most expensive housing market among all 50 states and suffers the highest rate of homelessness, particularly among low-income workers in the agricultural workforce. In 2015, Hawai`i Governor David Ige declared a state of emergency around homelessness in Hawaii. According to the USDA, in 2013, farm operators in Hawai`i paid their workers an annualized rate of almost $24,000[7] in a state where the average household income was $69,213.[8] The intent of the workforce micro-housing is to improve the quality of life for agricultural workers through the provision of affordable and creative housing environments for single occupancy residents.

The housing complex fronts the eastern edge of the central Neighborhood Lawn, close to available water supply and sewer services. Consisting of a five-story loft structure and one-story patio housing sandwiching a recreation park, the housing complex extends off-site residential land uses into the Food Hub Complex. In the five-story loft building, one hundred single occupancy dwelling units, 250-300 sf, surround an exterior elevated lawn on the second floor, the heart of the loft housing. Some penthouse units are two story lofts combining two sleeping areas, while several ground and second floor units have patios. Courts, patios, screened porches, arcades, and a Recreation Park offer "third places" that socially channel time outside of work. The third place concept was coined by sociologist Ray Oldenburg in his book, *The Great Good Place: Cafes, Coffee Shops, Bookstores, Bars, Hair Salons, and Other Hangouts at the Heart of a Community*, to examine social capital produced in neighborhood institutions.[9] Accordingly, we can apply this thinking to the layers of public space that should be present in multi-family housing complexes. Third spaces underpin and likely predict the advancement of social capital among residents, including the forging of close ties in support networks that supplement those of family.

6 Page, Christina, Lionel Bony, and Laura Schewel. *Island of Hawai`i Whole System Project Phase I Report*, Rocky Mountain Institute, March 2007.

7 National Agricultural Statistics Service. *Hawai`i Agricultural Labor*, United States Department of Agriculture, May 28, 2013, https://www.nass.usda.gov/Statistics_by_State/Hawaii/Publications/Miscellaneous/aglaborFF.pdf.

8 Department of Numbers. *Hawaii Household Income*, 2015, http://www.deptofnumbers.com/income/hawaii/.

9 Oldenburg, Ray. *The Great Good Place: Cafes, Coffee Shops, Bookstores, Bars, Hair Salons, and Other Hangouts at the Heart of a Community*, Da Capo Press, 1999.

Neither home nor work, third places are communal spaces where the rules of good conversation and conviviality govern social interaction, important in creating a healthy and robust civil sphere. Third places also extend the modest living spaces of single occupancy units to create an expanded living transect that includes public amenities and services. Bordering the south edge of the Recreation Park, a refurbished exterior shed—a community Super Roof—houses a basketball court, social services offices, and indoor gathering space completing the shared housing landscape that compensates for the small space of the dwelling unit. The secret of good multi-family housing lies in the design of the shared landscape. More than individual units, the public and semi-public spaces derived from porches, stairways, corridors, and green spaces that connect units are the key factors in deriving quality residential environments.

Agricultural Research and Innovation Hub

Located on the ground floor of the Workforce Micro-Housing loft structure, fronting the Neighborhood Lawn and Whitmore Avenue, the Innovation Hub recalls the frugality of main street's house-over-shop formula. This starter space is 8,600 sq ft. Future expansion can be accommodated in adjacent Tenant Food Producer Commercial Facilities to be developed per tenant needs. Integrating the Innovation Hub with the housing structure serves several interests. First, the Innovation Hub can hedge its investments without having to build a freestanding structure among uncertainty over space needs and patronage. Second, housing on the ground floor of the Neighborhood Lawn is not an appropriate use for a highly visible public space, though vertical mixing of residential and commercial uses is very desirable. Since the Innovation Hub is intended to support speculative activities, the space has 14-foot high ceilings with garage doors for vehicular and robotic equipment access from side elevations. Floating wet cores related to kitchen and bathrooms support both an open floor plan and legible subdivision of the plan into designated areas.

Machine Shop

The existing Machine Shop fronts Whitmore Avenue and occupies a central position at the edge of the Neighborhood Lawn. The shop is an important repair and fabrication facility, servicing farm vehicles and fabricating agricultural tools and parts for the region. While the metal building skins have experienced extensive corrosion from salt, visual inspection suggests that the structure appears to be salvageable. However, final determination of structural integrity is beyond the scope of this contract and requires confirmation from a licensed engineer. If the structure is salvageable, we recommend recladding the exterior with a panelized cementitious fiber board system as illustrated in the report. Cement fiber board offers superior resistance to water and mold/mildew at a favorable cost compared to other cladding systems. The Machine Shop holds the potential to become a unique landmark in the overall development plan, combining utility with a pageantry from color combinations in exterior panel systems.

Water Harvesting System

The Food Hub Complex at build-out requires approximately two million gallons of potable water daily. Since local water supply is questionable in meeting this requirement during peak demand, site design incorporates a supplemental water harvesting and storage landscape. While the Harvesting System recycles and even upcycles water for ancillary uses through grey water treatment, the key objective is provision of potable water upon demand (aim of the Food Hub is to support a three-shift operation). While a Potable Water Storage Tank located in the Logistics Yard sustains local water supply, it also provides additional on-site fire suppression capacity and maintains constant pressurization. Reclaimed Water Storage Tanks located on the Neighborhood Lawn redistribute post-treatment storage for site irrigation needs and other conforming grey water building uses within the Workforce Housing and Food Hub buildings.

More than simply infrastructure, water curates spaces in the Food Forest and Taro Demonstration Garden, a wetland food production landscape. Water Storage Towers on the Neighborhood Lawn's pond are landmarks celebrating local agricultural heritage. The Towers project archival images from plantation era life on the central plain (ideally changeable with representations from the era of the ahupua`a), providing historic context for visitors. Here, water systems are used to construct the physical site while memorializing the area's agricultural heritage in shaping culture.

3 Connectivity

Connect the Food Hub and Whitmore Village to downtown Wahiawa.

The site of a former high-security Dole Food Company operations facility, the Whitmore Food Hub Complex connects an isolated Whitmore Village to downtown Wahiawa across the canyon. Similar to post-WWII *first ring suburbs*, Whitmore Village evolved into a bedroom community for a workforce supporting a military base and nearby plantation-based food production operations. While first ring communities characteristically enjoy moderate housing densities and sufficient utilities to accommodate expansion, they lack mixed uses and neighborhood identity. Indeed, Whitmore Village's Walk Score is 28 out of 100, "Car-dependent", where access to essential services requires a car.[10] Meanwhile, nearby downtown Wahiawa's Walk Score ranges up to admirable 79, indicating walkable, mixed-use neighborhoods where zero-car households can thrive without the use of an automobile.

The Food Hub's public space system features a foot-bicycle Bridge and Zip Line (optional) spanning the Kaukonahua Stream, connecting Whitmore Village to downtown Wahiawa's Community Center. The Bridge improves access from Wahiawa's residential areas to the Food Hub Complex as a new employment center, especially among zero-car households residing in Wahiawa. The master plan harnesses the civic potential in logistics/transportation investments to solve for larger connectivity gaps—also economic and equity gaps—in the town's urban fabric. Such synergistic solutions provide several public goods at once, only possible through public sector leadership.

The footbridge features signature gateways. The "Nest", a botanical pavilion with hanging gardens on the Wahiawa side, negotiates the 15-foot elevation difference between the two canyon edges by way of a compact spiral ramp. The spiral avoids having to ramp the bridge across its approximate 1,000-foot span, which would be fatiguing and unrewarding to walk. In the tradition of civic-oriented transportation infrastructure, the Nest provides Wahiawa with a memorable postcard-quality civic landmark celebrating arrival and departure. The Bridge and its gateways articulate neighborhood edges between Wahiawa and Whitmore Village, important for structuring neighborhood identity and improving wayfinding through town.

Opposite the Nest, the Zip Line Tower and Food Forest welcome visitors to the Food Hub Complex anchoring Whitmore Village. The Food Forest and adjacent Taro Demonstration Garden, a terraced wetland landscape, offer important education spaces exhibiting heritage food production. Food forests are vertically layered agricultural landscapes with seven stacked growing zones, ranging from overhead fruit tree canopies to roots and tubers underground. Sometimes referred to as "multistrata agroforestry", food forests mimic the regenerative structure of natural forests. Following permaculture principles of plant companioning, food forests were first cultivated in the fecund landscapes of tropical climates based on deep symbiotic relationships and hierarchies of access to sunlight among plants. Their morphology (structural form) is defined by plant guilds that optimize nutrient exchange—including healthy soil formation—for high-yield food production. Food forests are low-tech/high concept foraging landscapes, offering yet another public-sector strategy for streamlining edible landscapes and food literacy. The Whitmore Food Hub Complex could become the frontlines in promoting public fruit parks throughout Hawai`i, and the US for that matter.

4 Anchoring

Socialize the Food Hub's big boxes and tilt wall concrete construction through mixed uses and civic frontages.

While tilt wall concrete construction provides a clean industrial environment toward minimizing food contamination, its construction lacks an architectural pedigree with aesthetic or urban value. To address this challenge, we have shaped the frontages of Food Hub buildings through a "shade economy" to establish a welcoming sense of place for receiving visitors. A signature feature of the Neighborhood Lawn is the canopy system of circular metal sun shades that frame entry to the Visitor Center and the Food Hub Market at the centralized facility. The canopy system also grows with each successive phase of the Food Hub, visually linking buildings as they are added to the complex—akin to a mall. Multiple functions from education tours

10 Walk Score, 2017, https://www.walkscore.com/score/.

to dining and shopping at the Food Hub market can be accommodated under the canopies. The canopy system can be accessorized with lighting and signage systems as tenant needs require.

The canopy system leads to the Visitor Center (one primary and a secondary one to be added in a later phase) organized around exterior entry courts with gardens. The tilt wall system at public entries celebrate both civility and the technology of the continuous load-bearing mass through large-scale inverted arches. The scale of the inverted arches and their various patterns of openings are in harmony with the intrinsic "bigness" in warehouse design. The large arches operate at the scale of the site to celebrate entry in an otherwise inexpressive building technology. Pasting historical motifs on big box construction never leads to a satisfactory urban design or architectural design outcome. We recommend that concrete walls be tinted with color admixtures in concrete pours, providing a warmer and deeper dimension to concrete walls. Concrete does not have to look like concrete.

Smaller and freestanding Tenant Food Producer Commercial Facilities project civic frontage through arcades and porches/breezeways that wrap courtyards connecting to Food Hub buildings. Courtyard building typologies provide great flexibility, capable of multiple configurations per tenant needs. Courtyards are ideal couplers of difference, pivoting between large-scale production spaces and smaller scaled porches responsive to the human dimensions intrinsic to retail and housing development for the eastern portion of the site. Porches complement public visitor functions that may be designated within Commercial Food Hub buildings. Both contemporary and modern landmark buildings in O`ahu are courtyard buildings, a surprisingly underutilized building type nationally. Notwithstanding their scale differences, frontages of Tenant Food Producer Commercial Facilities complement the canopy system of the centralized Food Hub facility.

Influences throughout the proposed plan include traditional Hawaiian pavilion-and-court design, vernacular agriculture building types, and signature street environments, as they all produce high-quality urban places of dignity and generosity. Through pitch-and-roll roof forms, public canopy systems, and a signature bridge with landmark gateways, the architectural approach creates an iconic skyline from pragmatic building solutions. Urban design solutions have sought to uphold Wahiawa's Urban Design Plan and advance its image, particularly in the development of the community's "role as a 'gateway' between town and country",[11] where this project resides. The project also celebrates Wahiawa's "plantation heritage and rural, small-town atmosphere"[12] through proposal of unique urban agricultural landscapes that would be unfeasible to develop in the town core. Yet, these landscapes bring the vitality and refinement of the town core to a working country landscape, precisely what the plantations did.

11 Wilson Okamoto & Associates Inc. *Wahiawa Urban Design Plan*, City and County of Honolulu Planning Department, January 1998, available at https://sites.google.com/a/wahiawacbdo.org/public-site/downloads/wahiawa-information/1998-wahiawa-urban-design-plan-1.

12 Ibid.



Principles of Food Hub Plan

1. **Logistics:** Provide a Food Hub that meets the requirements of the Food Safety Modernization Act.
2. **Placemaking:** Integrate logistical spaces of the hub with surrounding neighborhoods through serial public spaces.
3. **Connectivity:** Connect the Food Hub and Whitmore Village to downtown Wahiawa.
4. **Anchoring:** Socialize the hub's big boxes and tilt wall concrete construction through mixed uses and civic frontages.

the project challenge?

Make car-dependent Whitmore Village a walkable, mixed-use neighborhood through development of the Food Hub as a community anchor.

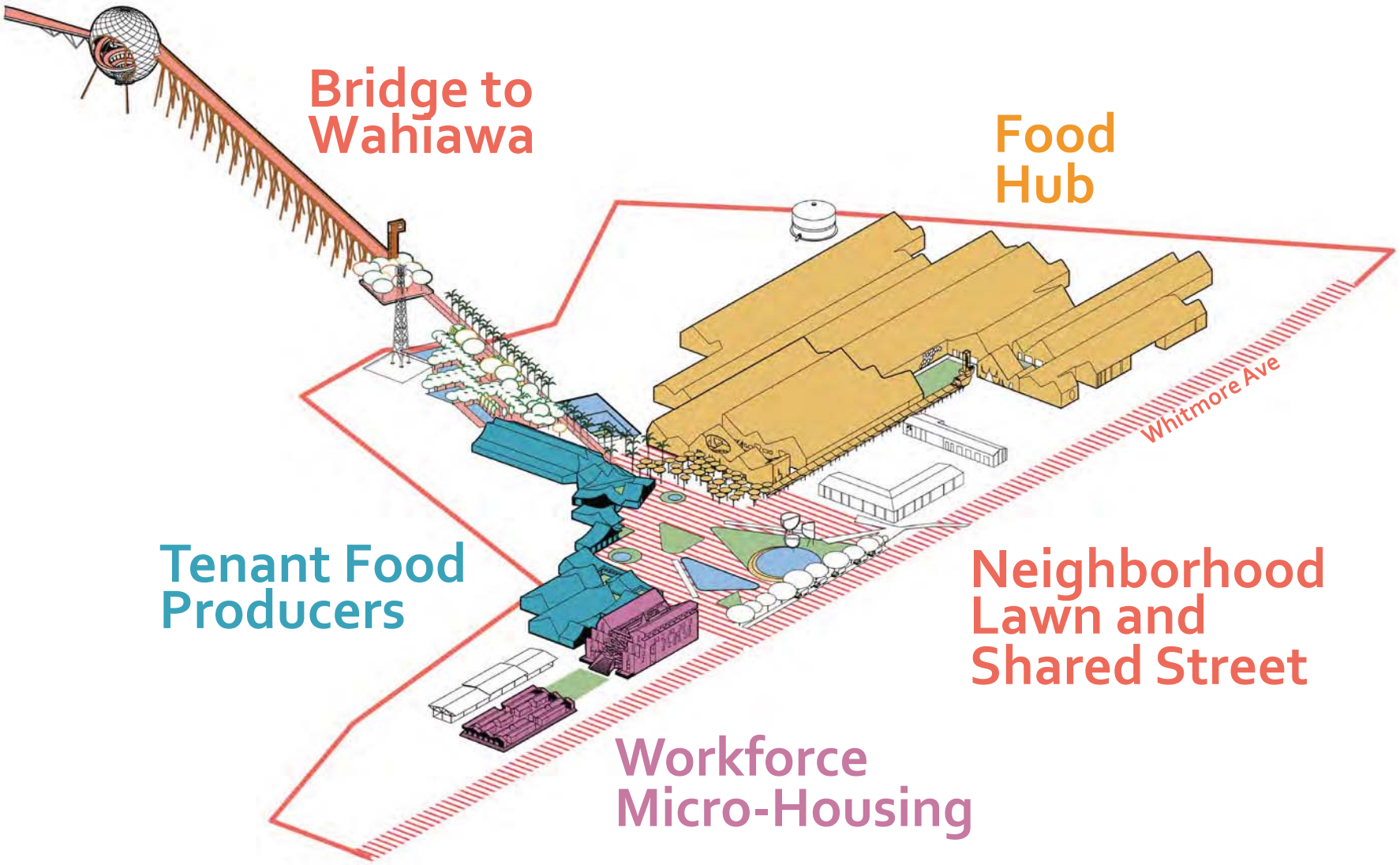


gateway to the north shore agriculture communities

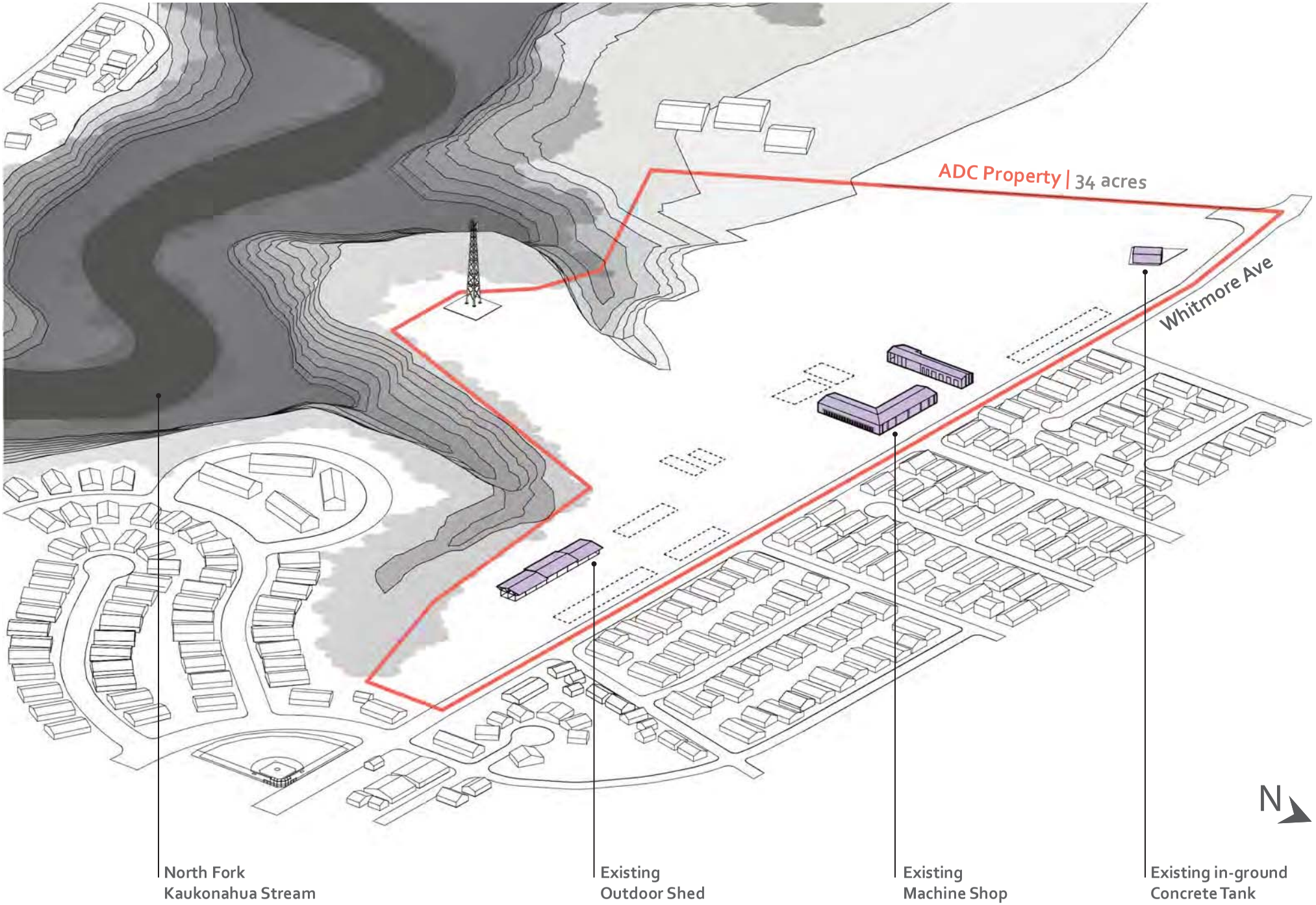
The Food Hub serves local growers' processing needs while value-adding housing, retail, technology incubation, and cultural tourism functions that complement downtown Wahiawa.

Former Dole Company Operation Facility

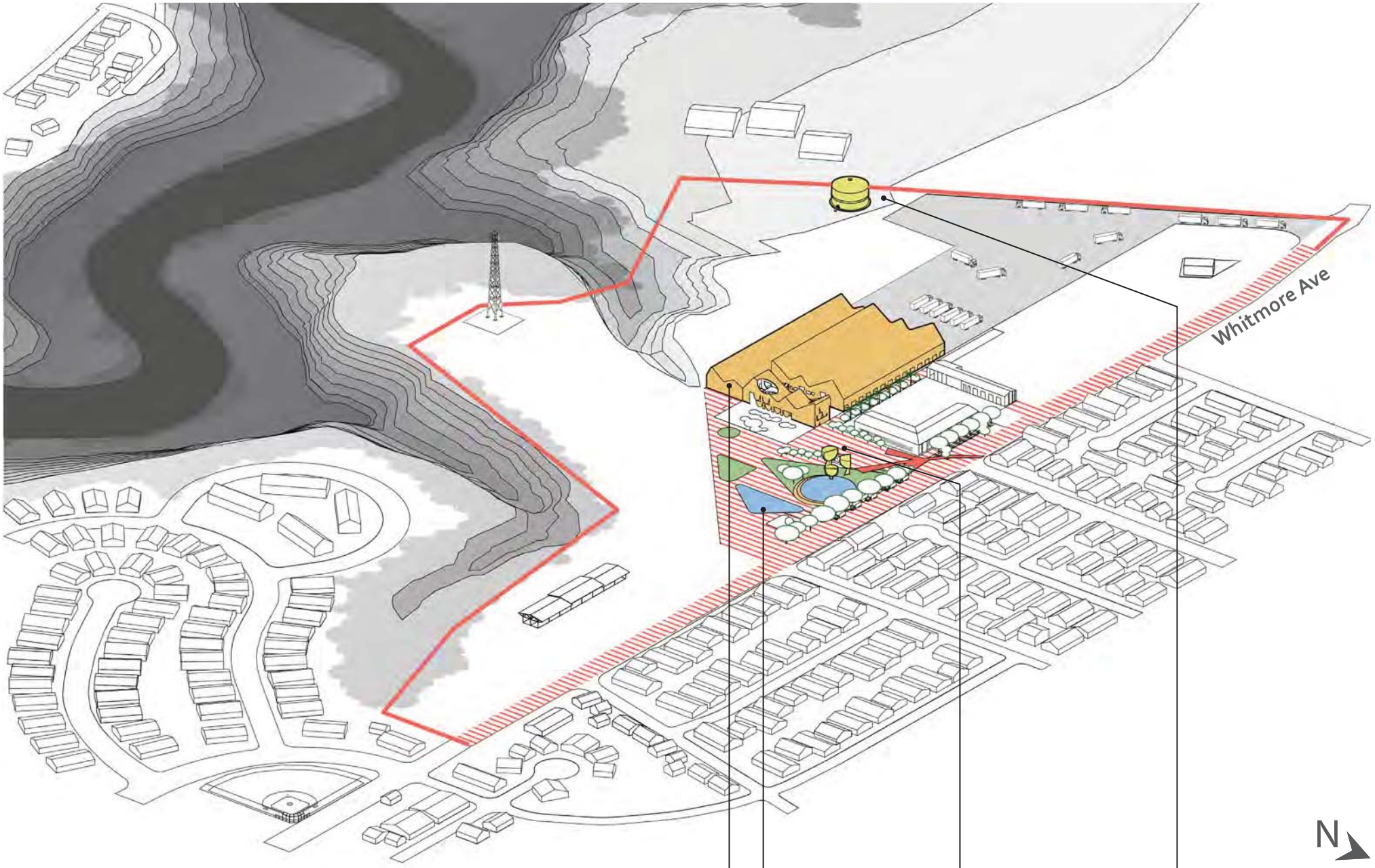



Bridge to Wahiawa
Food Hub
Whitmore Ave
Tenant Food Producers
Neighborhood Lawn and Shared Street
Workforce Micro-Housing

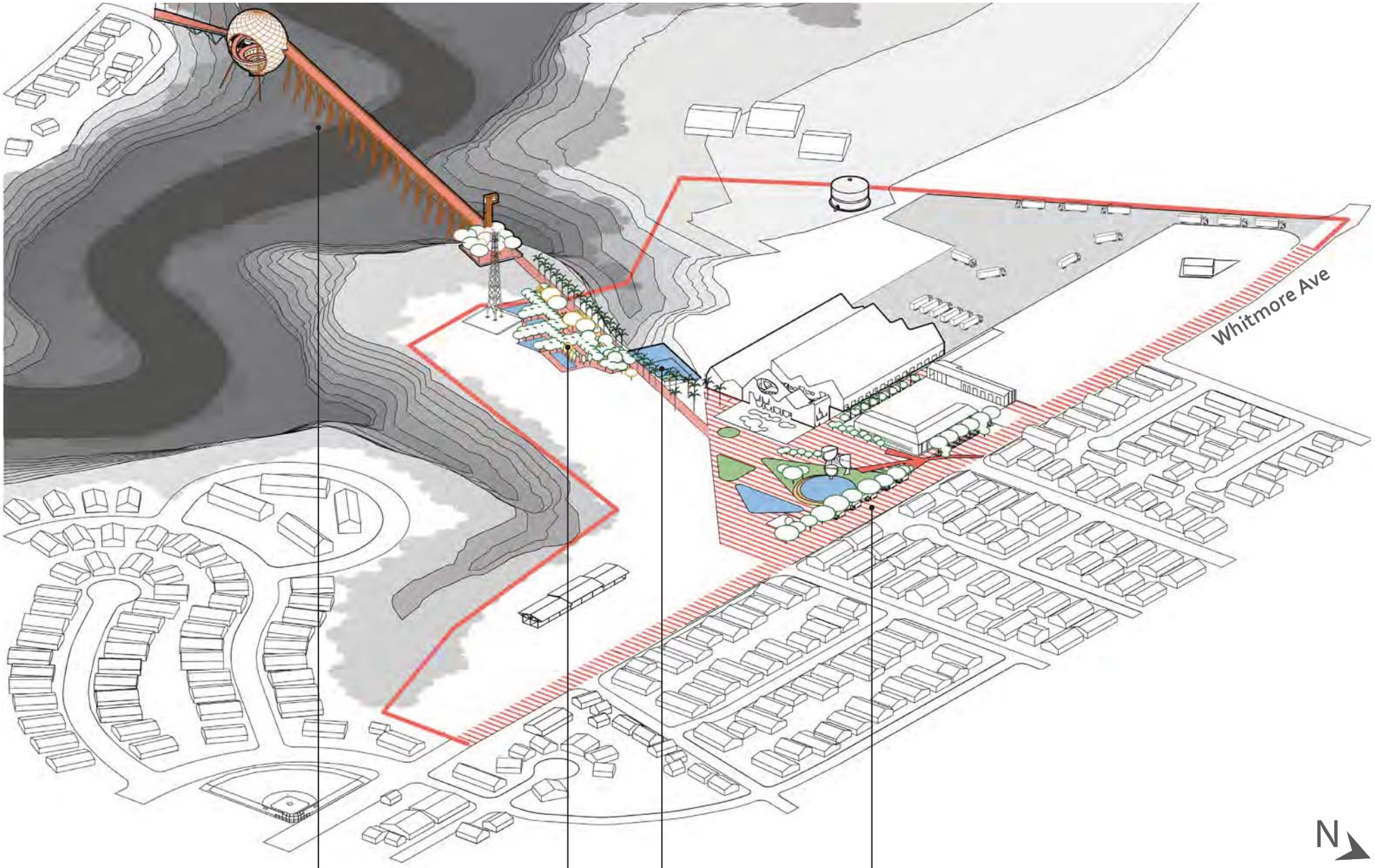
First, we preserve the machine shop and one shed | Asset Retention Strategy



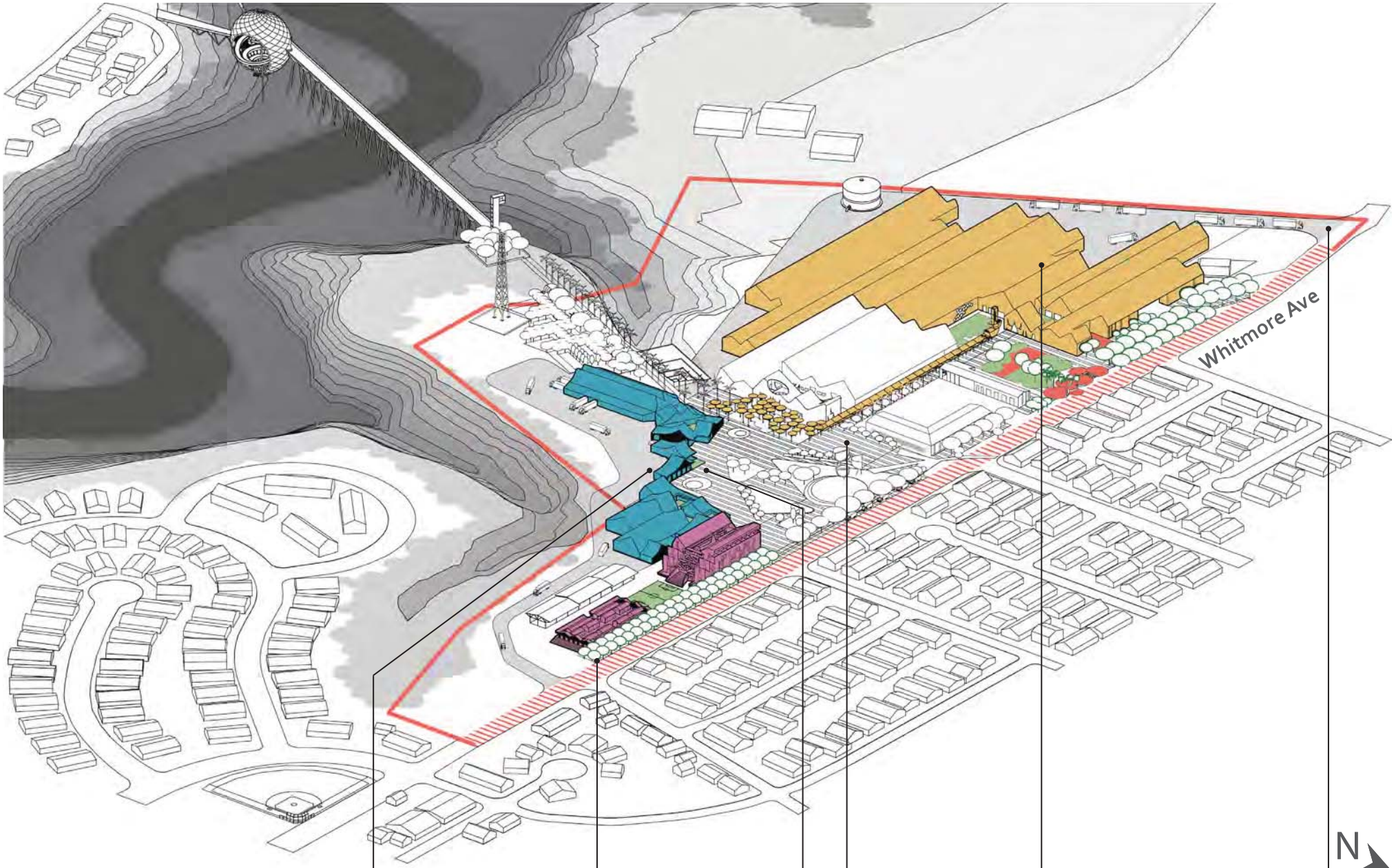
Then, we build a Food Hub | Pioneer Investment



We add public spaces to connect the Food Hub and downtown | Public Spaces



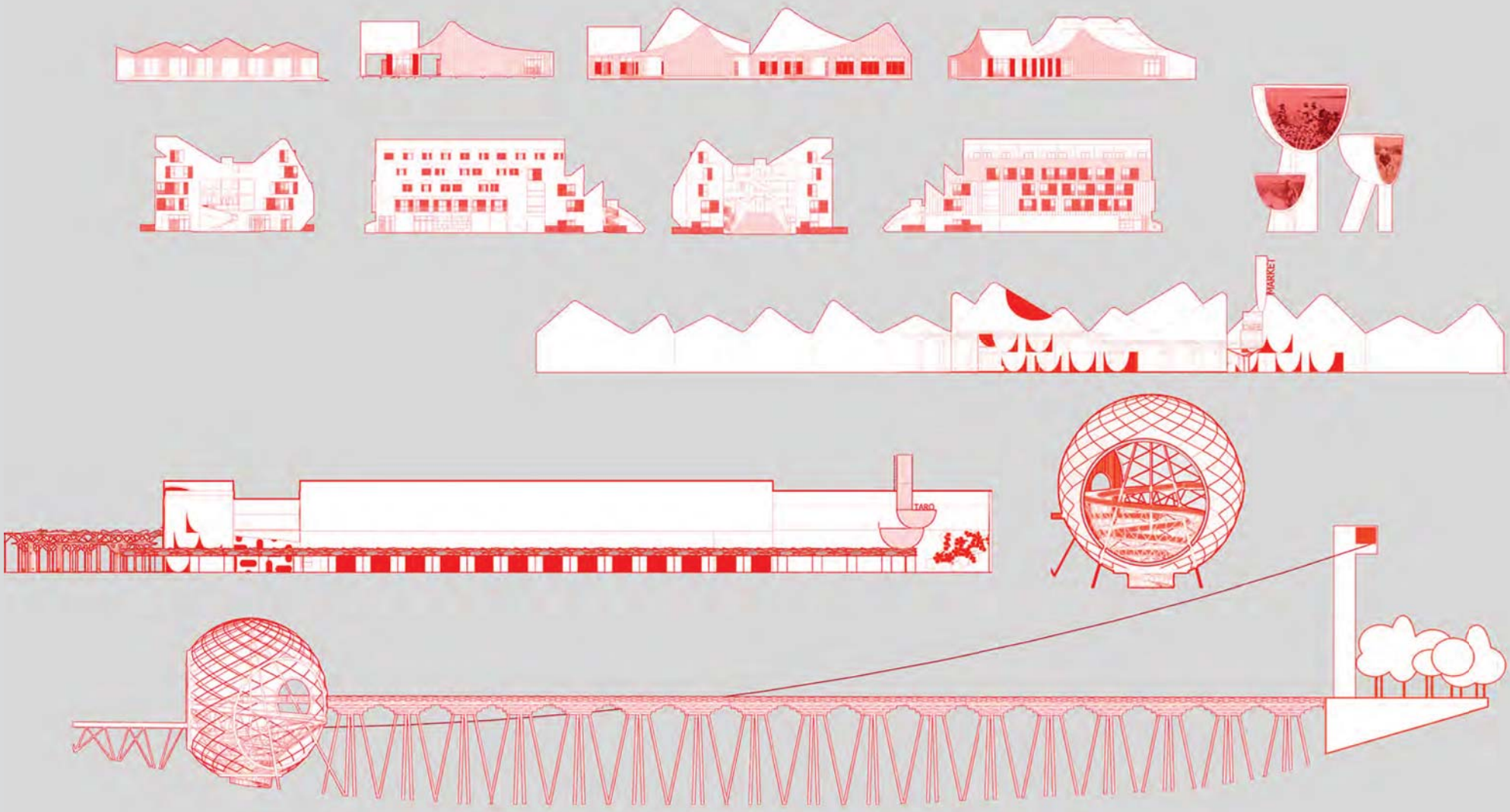
Then we develop other services as we build out the Food Hub | Food City

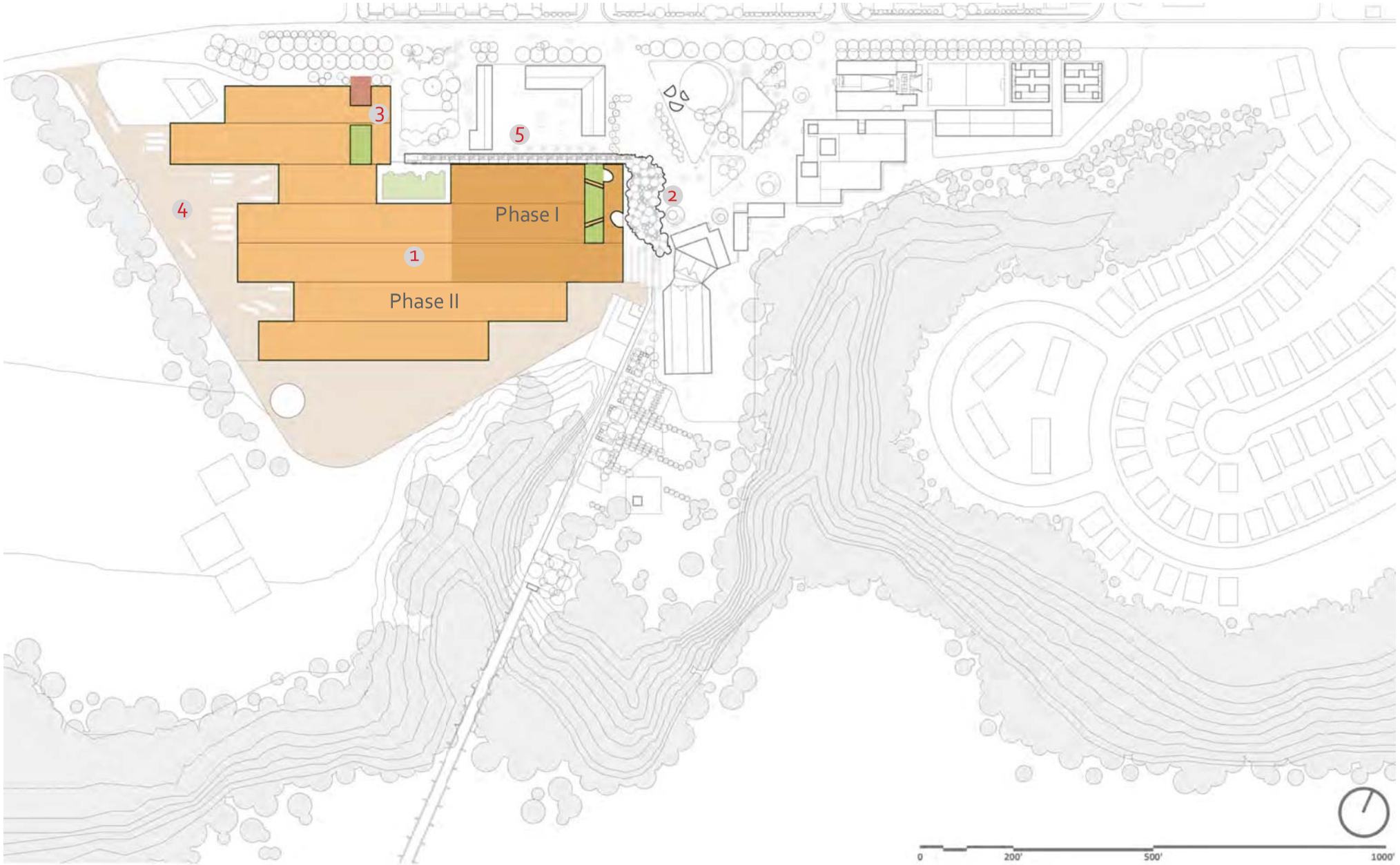




Whitmore Food Hub Complex Plan

1 Food Hub and Warehouse
2 Food Hub Retail and Visitor Center
3 Anchor Tenant Food Processing and Retail
4 Logistics Yard
5 Research and Innovation Hub
6 Tenant Food Producer Commercial Facilities
7 Taro Garden
8 Food Forest
9 Neighborhood Lawn/ Visitor Parking
10 Workforce Micro-Housing
11 Water Storage Tanks and Treatment Ponds
12 Hawaiian Sandalwood Grove
13 Bridge to Wahiawa
14 Existing Machine Shop - Renovated
15 Existing Outdoor Shed - Renovated


MARKET
TARO



Food Hub Facility

75,000 sqft Pioneer Investment - 375,000 sqft Full Build-out

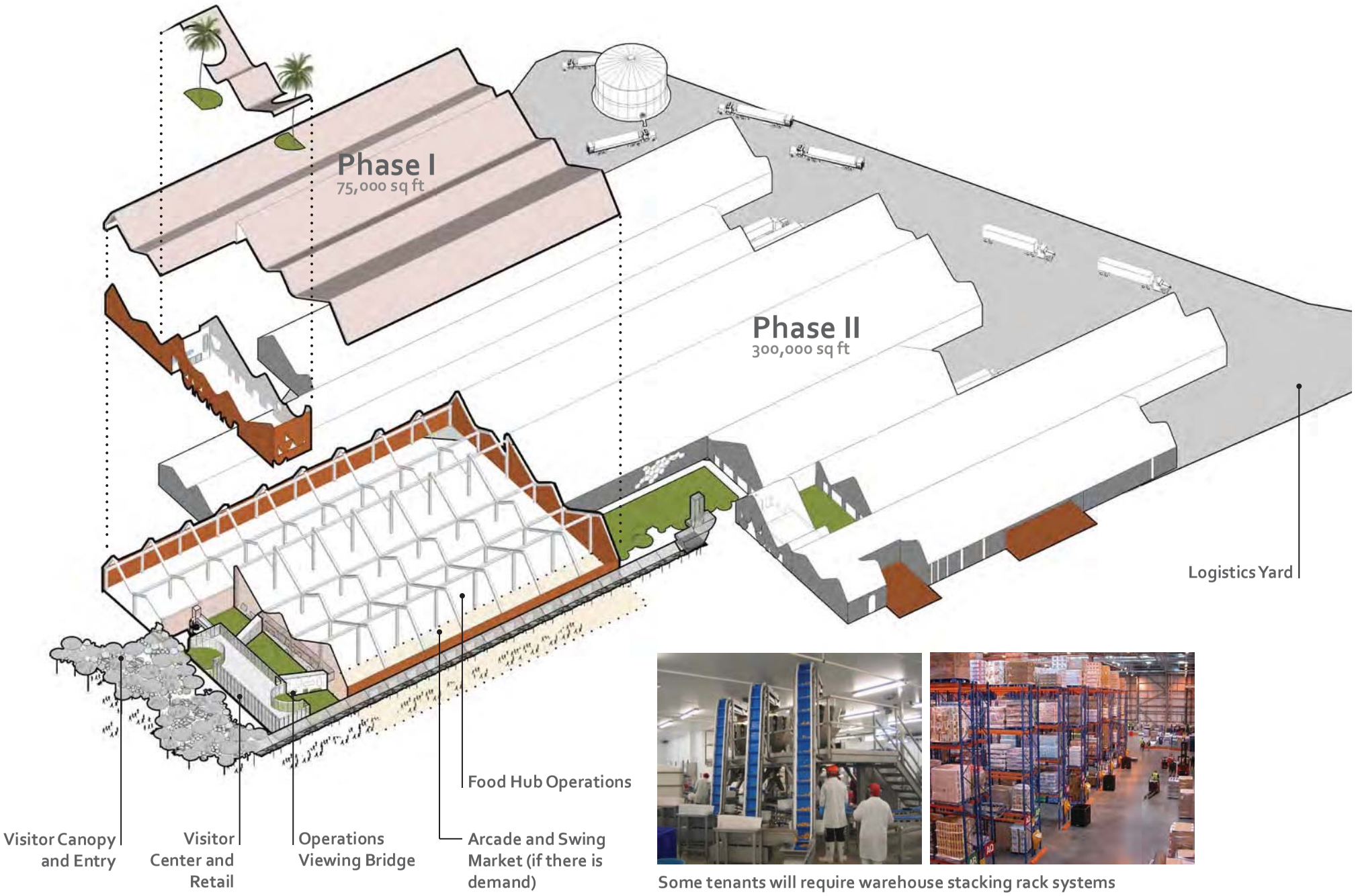
1 Food Hub and Warehouse
2 Food Hub Retail and Visitor
3 Anchor Tenant Food Processing and Retail
4 Water Storage Tank and Logistics Yard
5 Retail Arcade and Market



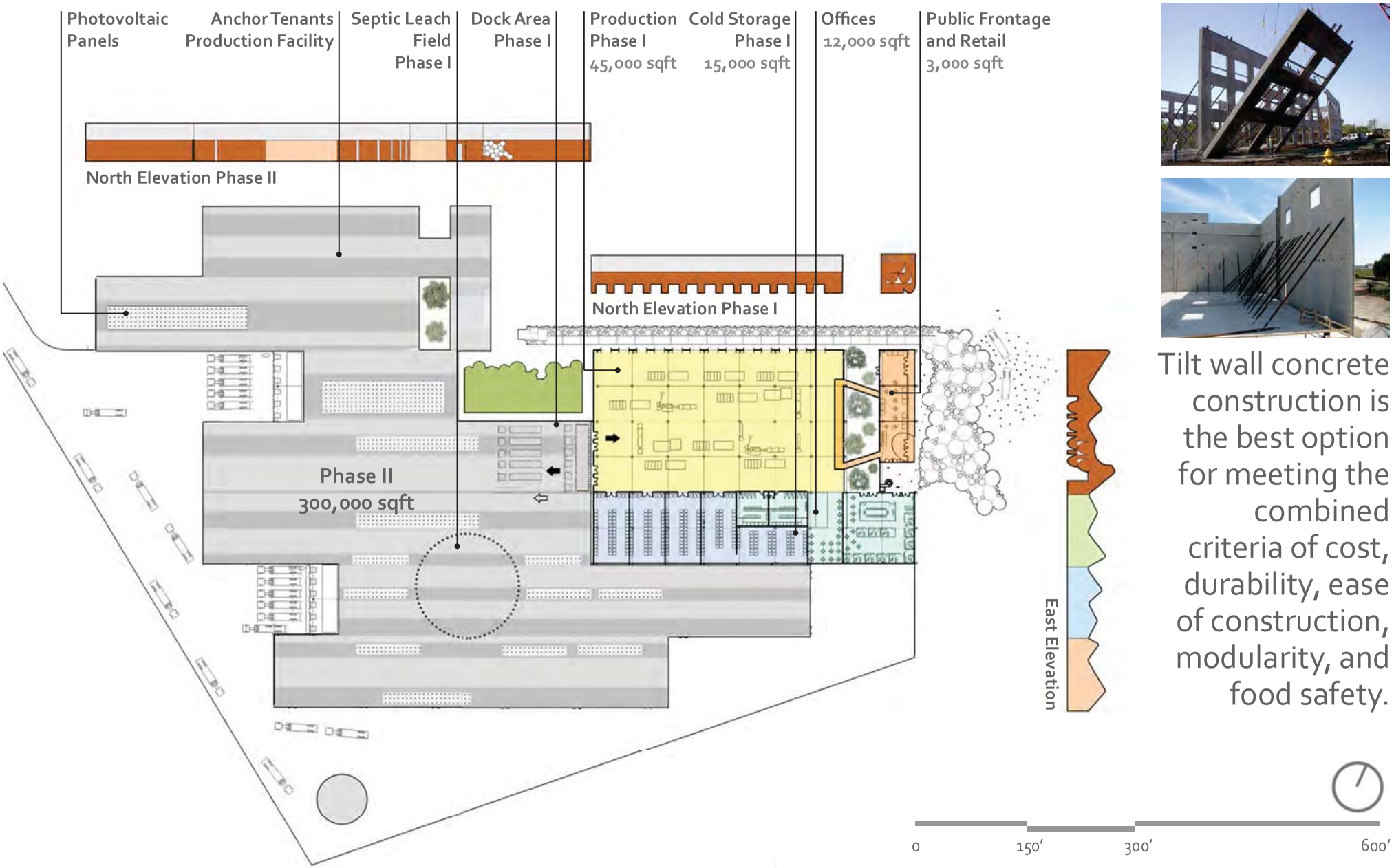
add canopies as umbrellas for visitors

We develop a SHADE ECONOMY around the Food Hub using canopies, trees, hanging gardens, and public frontages to welcome patrons. Consider fabricating canopies in the Machine Shop.

Develop the Food Hub incrementally as demand arises | Phasing



Some tenants will require warehouse stacking rack systems



Tilt wall concrete construction is the best option for meeting the combined criteria of cost, durability, ease of construction, modularity, and food safety.

the Food Safety Modernization Act (FSMA) changes agriculture

FSMA presents exacting regulations that challenge the business model of current food production practices, particularly hub facility design and scale.



Food Hub Operations | Operations Viewing Bridge | Visitor Center | Visitor Canopy and Entry

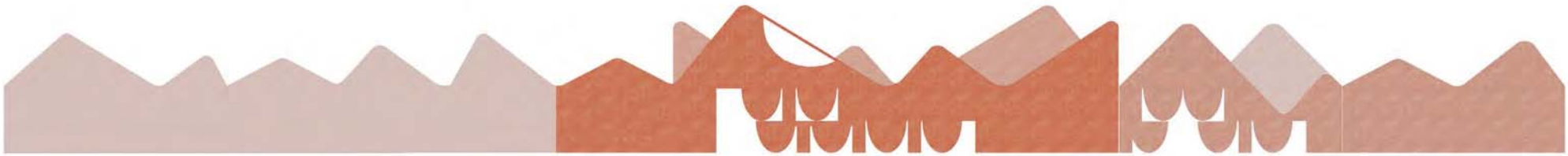
let's tour the Phase I Food Hub

. . . Phase I VISITOR CENTER AND RETAIL with Viewing Bridge to Food Hub Operations. Rooftop gardens and hall accent the visitor experience.

the hub also offers heritage and food literacy experiences

Therefore, the ORDINARY TILT CONCRETE WALL SYSTEM for large-scale logistics facilities is shaped for public entry and programs.







Inside the **Visitor Center entrance,**
a café in the arcade with hanging garden above.



Visitor Canopy weaves scattered site programs as the hub grows

Besides entry to the Visitor Center, the canopy wraps the Food Hub to become a linear market with views into the newly renovated Machine Shop.
Reclad Machine Shop with colored fiber board panels to create a landmark.



a farmer's market and shops?

Swing space on the Food Hub's north edge can reallocate production functions to retail in response to future demand.



the built-out Food Hub works like a mall

Visitor Canopy connects Phase I to Phase II Anchor Tenant Food Processing and Retail at courtyard.





Public Space System



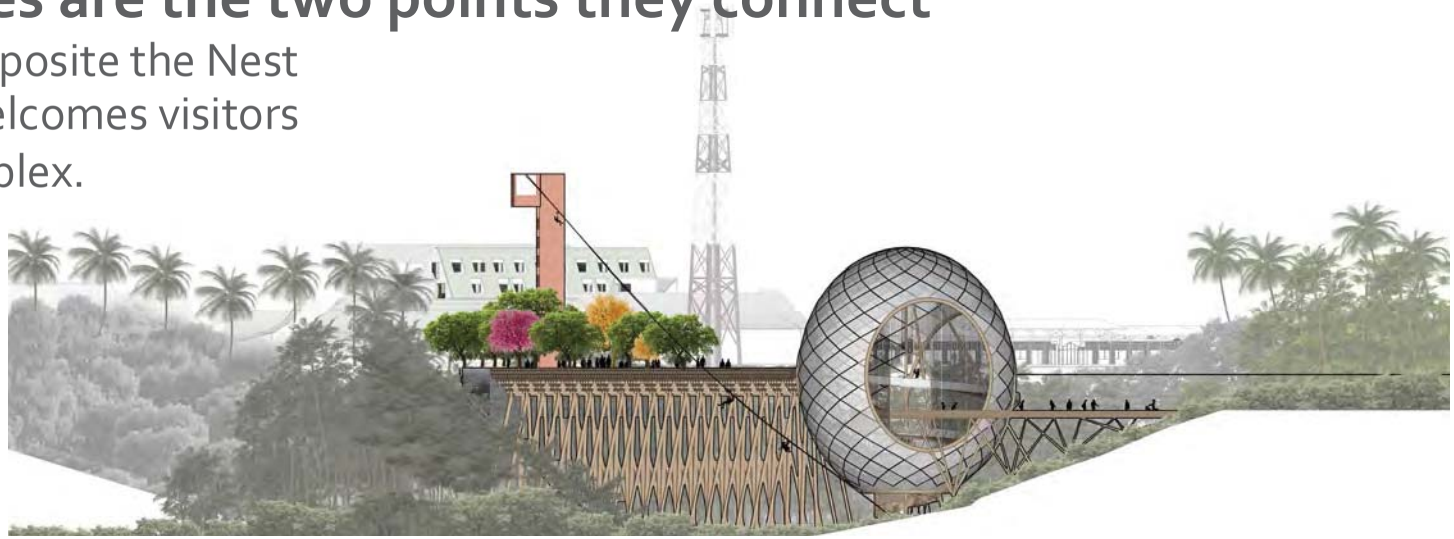


a new Wahiawa icon?

The NEST, a Botanical Pavilion with hanging gardens anchors nearby downtown Wahiawa to the Food Hub. The new Bridge includes a Zip Line over the Kaukonahua Stream.

the essence of bridges are the two points they connect

The FOOD FOREST opposite the Nest on the Wahiawa side welcomes visitors into the Food Hub Complex.





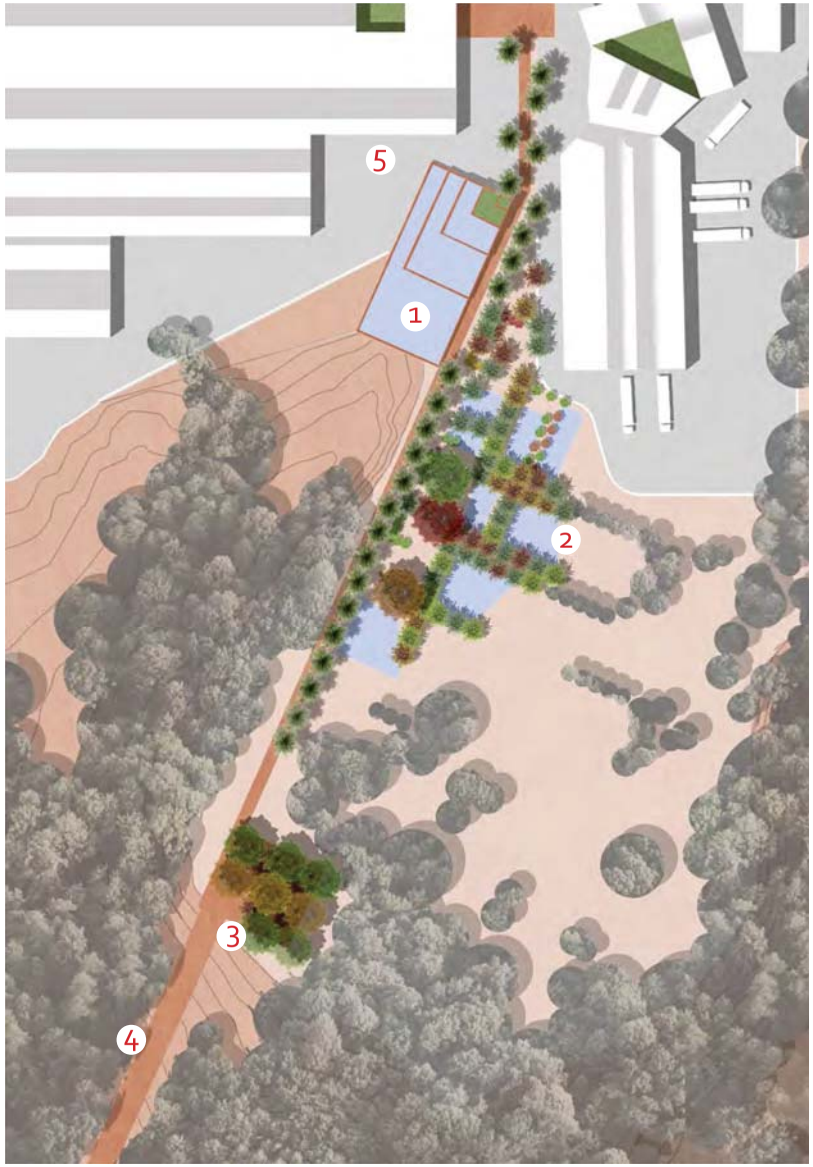
a spiral ramp negotiates the height difference between stream banks

Since the Wahiawa side is fifteen feet lower than the Food Hub Complex,
the Nest creates a unique space for transition. Otherwise,
the bridge as a ramp would be fatiguing and unrewarding to walk.

mural of the nearby Kukaniloko Birthing Stones welcomes visitors from Wahiawa

The mural is foregrounded by a demonstration wet Taro Garden and Food Forest.





build the USA's first public Food Forest demonstrating Permaculture principles

A tropical invention, the Food Forest optimizes natural food production through plant companioning and other principles of ecosystem-based farming.

Food Forest and Taro Garden

1. Taro Garden
2. Food Forest
3. Zip Line Tower
4. Bridge to Wahiawa
5. Kukaniloko Birthing Stones Mural

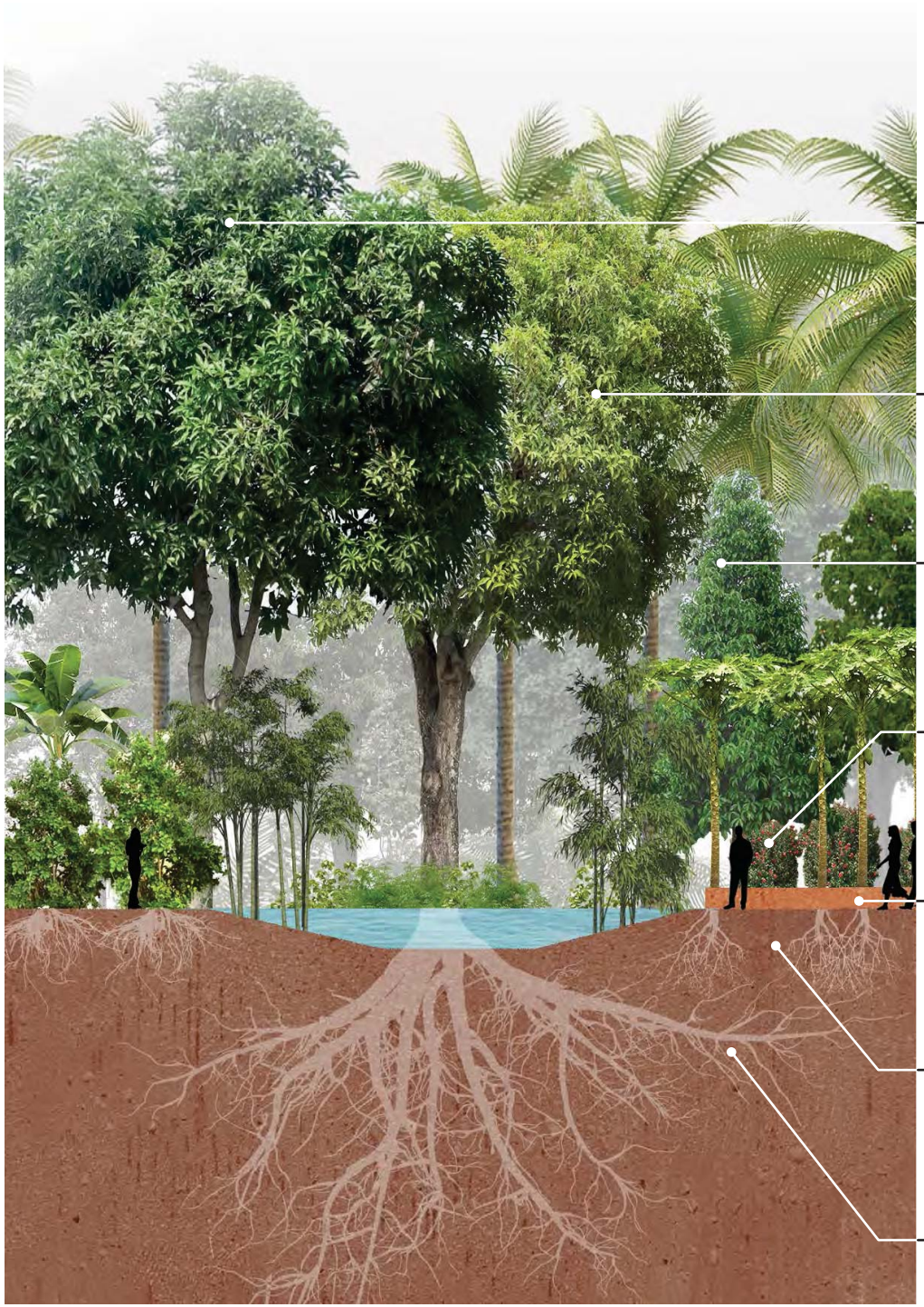


Food Forest Section

The Food Forest includes

SEVEN GROWING ZONES INVOLVING PLANT COMPANIONING

that cooperatively provide necessary ecosystem services. These plant guilds optimize healthy soil and nutrient exchange necessary for high-yield, natural food production.



CANOPY

Coconut Palm | Mango | Kou



Host trees that provide structural support to climbers seeking lights

CLIMBERS

Argyreia Nervosa | Artabotrys | Ficus Pumila



Vines optimize food yield per unit of plant biomass

SHRUB

Avocado | Banana | Papaya



Staples, legumes, fruits, vegetables, and fats

PROTECTORS

Pineapple | Chinese Hibiscus | Tropical Ornamental



Protection for others in the system (repellents, attractors, live fencing, etc.)

HERBS/HUMUS

Snap Bean | Lentils | Snow Pea



Legumes and organic matter that provide nutrients to the soil

GROUNDCOVERS

Hawaiian Blueberry | White Ginger | Plumbago Zeylanica



Protect soil, provide shade, hold moisture, and suppress weeds

MINERS OR DIGGERS

Sweet Potatoes | Carrots | Tomatoes



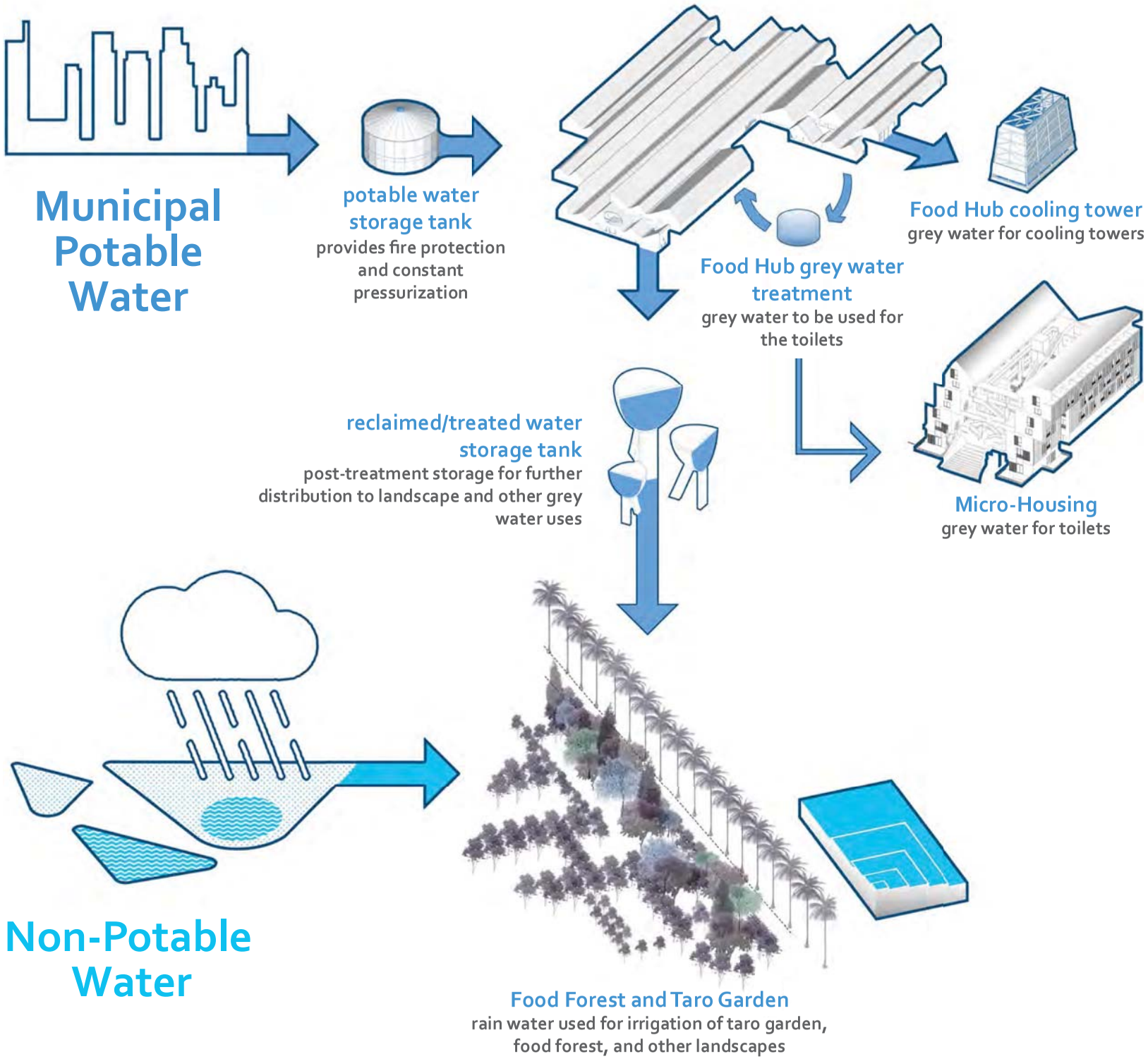
Deep roots and tubers open the soil and transport nutrients from subsurfaces







On the Neighborhood Lawn, WATER STORAGE TOWERS project images from plantation era life in the central plain surrounding Wahiawa.

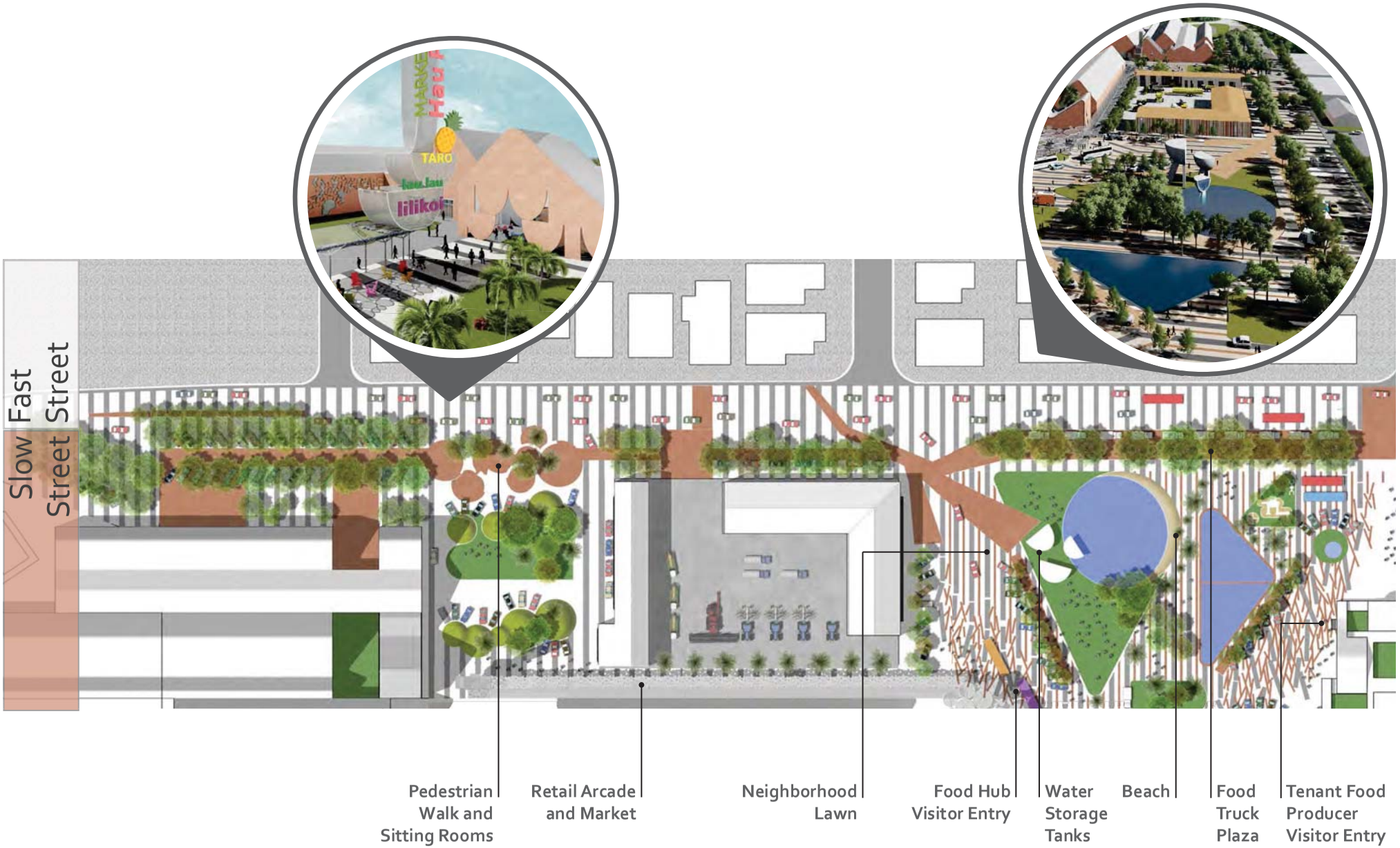

Municipal Potable Water
potable water storage tank
provides fire protection and constant pressurization
Food Hub grey water treatment
grey water to be used for the toilets
Food Hub cooling tower
grey water for cooling towers
reclaimed/treated water storage tank
post-treatment storage for further distribution to landscape and other grey water uses
Micro-Housing
grey water for toilets
Non-Potable Water
Food Forest and Taro Garden
rain water used for irrigation of taro garden, food forest, and other landscapes



make a cool neighborhood . . .

retrofit Whitmore Avenue as a signature **multi-way street!**





Multi-way streets accomodate slow and fast traffic

Create inviting experiences for resident and visitor alike.
This "SHARED STREETSCAPE" serves traffic, parking, and non-traffic functions for dining, strolling, recreating, and shopping along the Food Hub Complex.



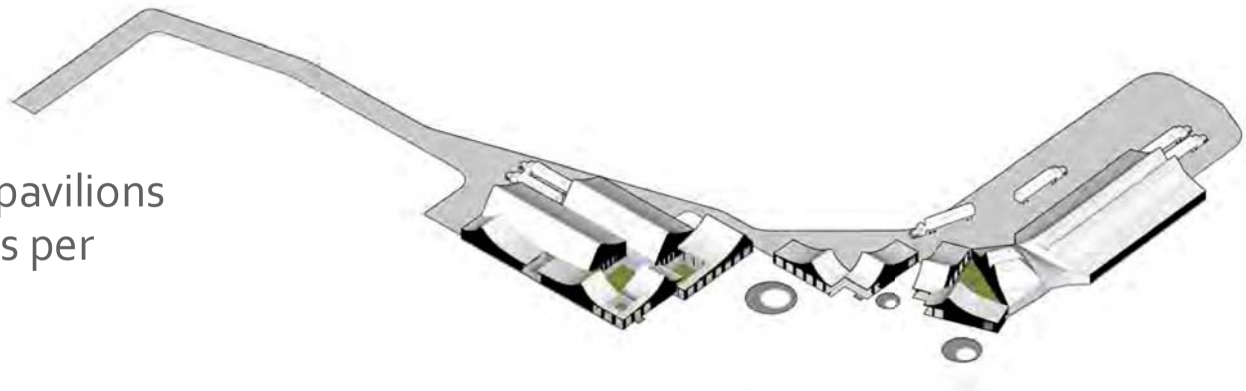
Tenant Food Producer Commercial Facilities

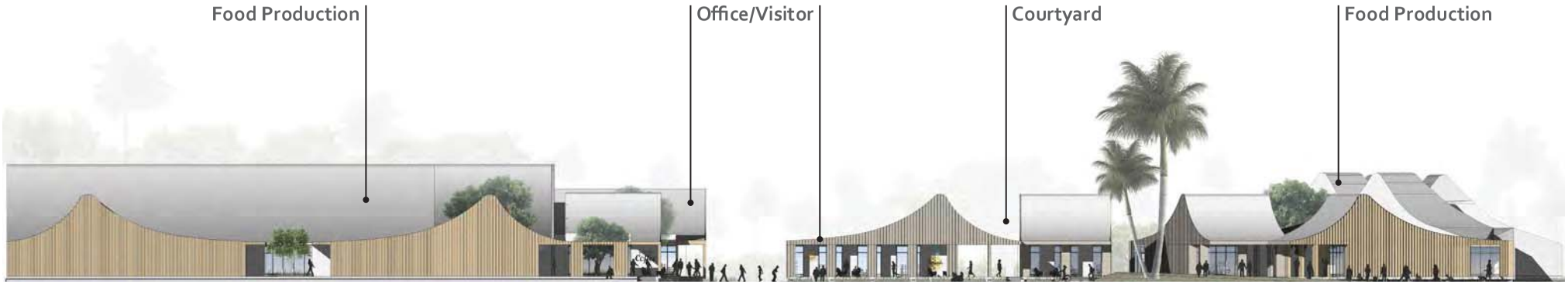
60,000 sqft Full Build-out

Tenant Food Producer Commercial Facilities 1
Logistics Yard 2

use the pragmatism and flexibility of vernacular building systems as inspiration

Tenant Commercial Facilities organize combined retail-food processing/production functions around courtyards, arcades, and pavilions capable of multiple configurations per individual needs.







Ordinary buildings can create place-based, climate-oriented spaces inviting to visitors. Functions could include a brewery, coffee roaster, juicery production, and an Island Seed Bank.



the three-sided courtyard—the ultimate flexible planning unit and always a pleasing space Courtyards connect large and small spaces, public and private functions, and production spaces with retail, while providing inviting experiences for tourists and workers alike.



the Neighborhood Lawn gives Whitmore Village an identity

In the tradition of a town square or village green,
the Lawn anchors divergent mixed uses and scales,
from micro-housing to big-box production facilities.



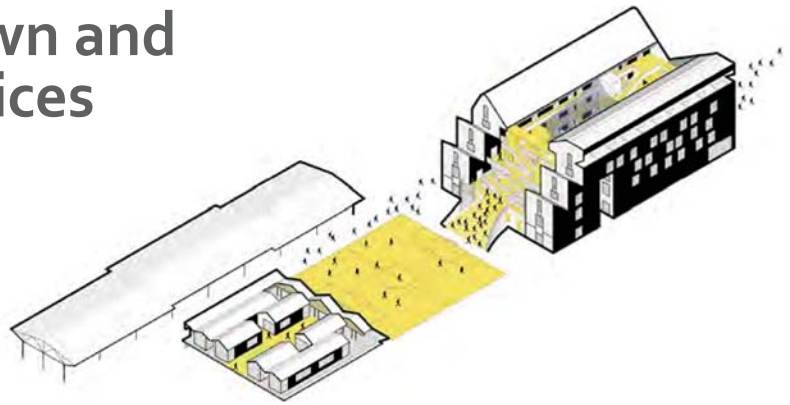
Workforce Micro-Housing

100 Units Total - 8,600 sqft Innovation Center

Workforce Micro-Housing 1
Research and Innovation Hub 2
Recreational Park 3
Maker Spaces 4
Basketball Court 5
Social Services 6

loft Micro-Housing units around elevated lawn and patios in the air; great living at affordable prices

Micro-Housing serves an agricultural workforce through 250-300 sqft single occupancy units arrayed around an internal court. Courts, patios, screened porches, arcades, and a recreation park offer "third places" that socially channel time outside of work.

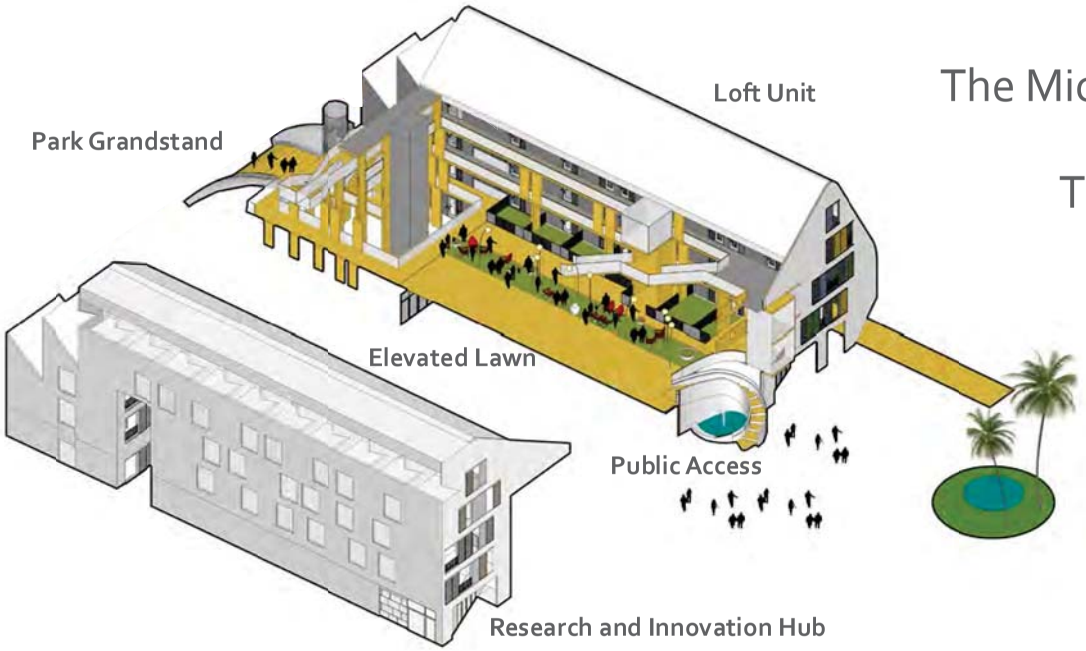




locate housing above the shop, just like Main Street

Dwelling units around patios and a shared court above the RESEARCH AND INNOVATION HUB replicate traditional Main Street strategies of placing residences above shops—the source of community vitality.





after work on the elevated lawn

The Micro-Housing Courtyard expands building circulation to create communal THIRD PLACES (neither home nor work) from stairs and corridors, enhancing sociability, livability, and overall sense of place.



Section through Micro-Housing Courtyard/Elevated Lawn



Second Level Plan

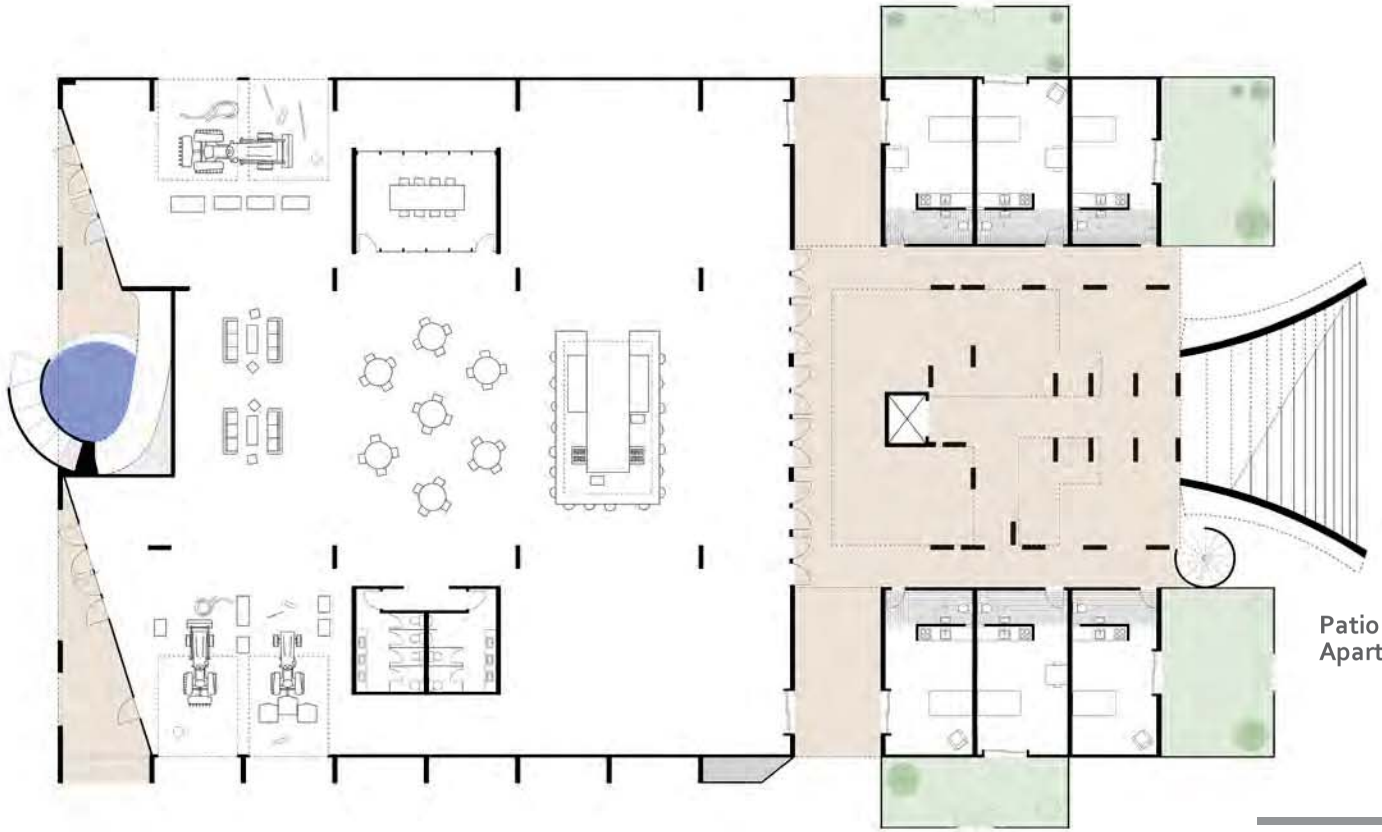
Renovate the **Existing Shed as a community Super Roof**
and add facilities underneath for recreational and social services, offices, and gathering.



Workforce Micro-Housing/Research and Innovation Hub

Shed

Patio Housing



First Level Plan



Despite being the same size, affordable units can vary in type to create great public frontages.







housing types for everybody . . . one-story Court and Patio Housing with arcade faces Loft Housing and Grandstand across the recreation park

Existing farm shed is upgraded to accommodate recreation spaces and social services.



the Food Hub Complex is also a model affordable work-live environment

Despite perceived incongruities between Micro-Housing and Tenant Food Producer Commercial uses, courtyards allow all uses to maintain a public face compatible with the Neighborhood Lawn.



The traditional American Food Hub is a renewed public good for those communities seeking food security and local solutions.

At full build-out, the Food Hub Complex provides a "missing middle" agriculture processing infrastructure, key to building resilience. The hub complex supports robust community-based food production, while providing place-based economic and heritage development.

UACDC UNIVERSITY OF ARKANSAS COMMUNITY DESIGN CENTER

University of Arkansas Community Design Center
an outreach center of the Fay Jones School of Architecture and Design
Stephen Luoni, *Steven L. Anderson Chair in Architecture and Urban Studies*, Director
Dr. Francisco Mejias Villatoro, Project Architect, Clinical Associate Professor
Michela Cupello, Assoc. AIA, Project Designer
Raheel Ahmad, Project Designer
Jonathan Martinez, Assoc. AIA, Project Designer
Kenneth C. Hiley, Project Designer
Maranda Gerga, Intern
Brian Hernandez-Dimas, Intern
Linda Komlos, Administrative Analyst

Fay Jones School of Architecture and Design
Peter MacKeith, Dean and Professor
Ken McCown, Assoc. AIA, ASLA, IFLI, Professor and Head, Dept of Landscape Architecture

Architecture Students:
Austin Autrey
Caitlin Caum
Chelsea Garrison
Derek Hukill
William Pendleton
Joshua Powell
Rafael Segura

Landscape Architecture Students:
Anna Gwaltney
Alexander Holyfield
Alexis Pacheco
Addison Warren

University of Arkansas Office for Sustainability/University of Arkansas Resiliency Center
Dr. Marty Matlock, PE, BCEE, Professor and Executive Director
Eric Charles Boles, Director

Office for Sustainability Students:
Brittany Jurgens, Intern
Brandon Wayerski, Intern
Olivia Morgan, Intern
Sam Lahodny, Intern

Hawai'i Department of Agriculture, Agribusiness Development Corporation
Jimmy Nakatani, Executive Director

Hawai'i Department of Agriculture, Aquaculture & Livestock Support Services
Todd Low, Manager

Hawai'i State Legislature Senate District 22
Senator Donovan Dela Cruz
Dane Wicker, Chief of Staff
David Cho, Legislative Aide

High Technology and Development Corporation
Robbie Melton, Executive Director and CEO

Hawai'i Housing Finance Development Corporation
Craig Hirai, Executive Director
Janice Takahashi, Chief Planner

Mari's Gardens
Fred Lau, Owner

Consultants
University of Hawai'i at Mānoa, School of Architecture
Dr. Daniel Friedman, FAIA, Dean and Professor

University of Hawai'i Community Design Center
Cathi Ho Schar, AIA, Director, Adjunt Assistant Professor

Images
cover © Kipahulu Ohana

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APPENDIX B
Flora and Fauna Study



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FLORA AND FAUNA STUDY

WHITMORE COMMUNITY FOOD HUB COMPLEX

WAHIAWĀ, OAHU

by:

Robert Hobdy
Environmental Consultant
Kokomo, Maui
September 2018

Prepared for:
PBR HAWAII

FLORA AND FAUNA STUDY
WHITMORE COMMUNITY FOOD HUB COMPLEX
WAHIAWĀ, OAHU

INTRODUCTION

The Whitmore Community Food Hub Complex Project is located in Whitmore Village on 34 acres of Central Oahu's Leilehua Plain TMK: (1) 7-1-02:009, see (Figures 1 & 2). It lies on the south edge of Whitmore Village and above the north fork of the Kaukonahua Stream. This flora and fauna study was initiated by PBR Hawaii in support of the planning process for this Agribusiness Development Corporation project.

SITE DESCRIPTION

The project area lies on the site of the former Dole Pineapple Company's administration office and operational baseyard. Several old structures remain on the property as well as a nursery and landscaping. The vegetation consists of a great variety of lawn grasses, ornamental trees, agricultural crops and weedy plants. Elevations range between 1,010 feet on the nearly level plateau land to 920 feet on a small area on the steep slopes down toward the north fork of the Kaukonahua Stream. Rainfall average 50 inches a year with the majority occurring during the winter months (Armstrong, 1983). Soils consist of a variety of deep, well-drained silty clays of the Wahiawā, Leilehua, Kolekole and Helemano series (Foote et al, 1972).

SURVEY OBJECTIVES

This report summarizes the findings of a flora and fauna study of the proposed Whitmore Community Food Hub Complex Project that was conducted in September 2018. The objectives of the survey were to:

1. Document what plant and animal species occur on the property or may likely occur in the existing habitat.

2. Document the status and abundance of each species.

3. Determine the presence or likely occurrence of any native flora and fauna, particularly any that are Federally listed as Threatened or Endangered. If such occur, identify what features of the habitat may be essential for these species.

4. Determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the native flora and fauna in this part of the island.

BOTANICAL SURVEY REPORT

SURVEY METHODS

A walk-through botanical survey method was used to cover this 34 acre project area. All representative habitats were examined including landscaped areas, nursery, agricultural crops, field margins and steeper gulch slopes. Close attention was given to ascertaining the presence of any native plant species and to determine if any of these were listed as Threatened or Endangered.

DESCRIPTION OF THE VEGETATION

The vegetation consisted of a wide variety of herbaceous plants, shrubs, trees and vines. A total of 148 plant species were recorded during two site visits. Of these about 30 % were ornamental species and an additional 15% were crop plants. Another 8% were "canoe" plants, brought to Hawaii during the Polynesian migrations. Most of the remaining species were brought here purposely or accidentally since 1778.

Just four plant species were found to be common in the project area during the survey: Guinea grass (*Megathyrsus maximus*), albizia (*Falcataria moluccana*), parasol leaf tree (*Macaranga tanarius*) and fiddlewood (*Citharexylum caudatum*). All four of these are non-native and all of them are considered to be invasive species. Thirty two species were of uncommon occurrence and 117 species were rare here.

Just four species of native plants were found: (*Cyperus polystachyos*) no common name, hala (*Pandanus tectorius*), hau (*Hibiscus tiliaceous*) and ʹuhaloa (*Waltheria indica*). All four of these are widespread and common indigenous species in Hawaii and are also found on other Pacific islands as well.

DISCUSSION AND RECOMMENDATIONS

The vegetation in this project area is dominated by non-native species. Just four species were native to Hawaii, hala, hau and ʹuhaloa and (*Cyperus polystachyos*). All of these are quite common and widespread in Hawaii. No Endangered or Threatened plant species were found during the survey, nor were any seen that are candidates for such status. No special native plant habitats were found here either.

Because the vegetation in this project area and the surrounding residential neighborhood is dominated by common non-native plants, and because there are no rare or protected native species in or near this area, there is little of botanical concern with regard to this project. The proposed development is not expected to have a significant negative impact on the botanical resources in this part of Oʹahu.

No special recommendations with reference to plants are deemed appropriate or necessary.

PLANT SPECIES LIST

Following is a checklist of all those vascular plant species inventoried during the field studies. Plant families are arranged alphabetically within each of four groups: Ferns, Conifers, Monocots and Dicots. Taxonomy and nomenclature of the plants are in accordance with Wagner et al. (1999) and Staples & Herbst (2005).

For each species, the following information is provided:

1. Scientific name with author citation.

2. Common English or Hawaiian name.

3. Bio-geographical status. The following symbols are used:

   endemic = native only to the Hawaiian Islands; not naturally occurring anywhere else in the world.

   indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

   non-native = all those plants brought to the islands intentionally or accidentally after western contact.

   Polynesian = brought by the Hawaiians during Polynesian migrations.

4. Abundance of each species within the project area:

   abundant = forming a major part of the vegetation within the project area.

   common = widely scattered throughout the area or locally abundant within a portion of it.

   uncommon = sparsely scattered throughout the area or occurring in a few small patches.

   rare = only a few isolated individuals within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
FERNS			
POLYPODIACEAE (Polypody Fern Family)			
Phlebodium aureum (L.) J. Sm.	rabbit foot fern	non-native	rare
Phymatosorus grossus (Langsd. & Fisch.) Brownlie	laua'e	non-native	rare
Platycerium bifurcatum (Cav.) C. Chr.	staghorn fern	non-native	rare
CONIFERS			
ARAUCARIACEAE (Araucaria Family)			
Araucaria columnaris (G. Forst.) J.D. Hooker	Cook-pine	non-native	uncommon
PODOCARPACEAE (Padocarp Family)			
Afrocarpus gracilior (Pilg.) C.N. Page	East African yellowood	non-native	rare
MONOCOTS			
ARECEAE (Aroid Family)			
Colocasia esculenta (L.) Schott	kalo	Polynesian	rare
Philodendron bipinnatifidum Endl.	selloum	non-native	rare
ARACACEAE (Palm Family)			
Cocos nucifera L.	niu, coconut	Polynesian	rare
Livistona chinensis (Jacq.) Martius	Chinese fan palm	non-native	rare
Phoenix roebelenii O'Brien	dwarf phoenix palm	non-native	rare
Pritchardia thurstonii F. Mueller & Drude	Thurston's fan palm	non-native	rare
Roystonea oleracea (Jacq.) O.F. Cook	cabbage palm	non-native	rare
Roystonea regia (Kunth) O.F. Cook	Cuban royal palm	non-native	rare
Veitchia merrillii (Beccari) H.E. Moore	Manila palm	non-native	rare
Wodyettia bifurcata A.K. Irvine	foxtail palm	non-native	rare
ASPARAGACEAE (Asparagus Family)			
Cordyline fruticosa (L.) A. Chev.	kī, tī	Polynesian	rare
Dracaena fragrans (L.) Ker-Gawler	fragrant dracaena	non-native	rare
Dracaena marginata Lamarck	marginata dracaena	non-native	rare
Sansevieria trifasciata Prain	sansevieria	non-native	rare
BROMELIACEAE (Bromeliad Family)			
Aechmea blanchettiana (J.G. Baker) J.B. Smith	Blanchette's bromeliad	non-native	rare
Neoregelia x	hybrid neoregelia	non-native	rare
COMMELINACEAE (Dayflower Family)			
Commelina diffusa N.L. Burm.	honohono	non-native	rare
CYPERACEAE (Sedge Family)			
Cyperus gracilis R. Br.	McCoy sedge	non-native	rare
Cyperus polystachyos Rottb.	----------	indigenous	rare
HELICONIACEAE (Heliconia Family)			
Heliconia psittacorum L. fil.	parrot's beak heliconia	non-native	rare
MUSACEAE (Banana Family)			
Musa acuminata x balbisiana Colla	banana	non-native	rare
PANADANACEAE (Screw Pine Family)			
Pandanus tectorius S. Parkinson ex Z.	hala	indigenous	rare
POACEAE (Grass Family)			
Axonopus fissifolius (Raddi) kuhlm	narrow-leaved carpetgrass	non-native	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
Brothriochloa bladhii (Retz.) S.T. Blake	----------	non-native	rare
Chloris barbata (L.) Sw.	swollen fingergrass	non-native	rare
Chloris divaricata R.Br.	stargrass	non-native	rare
Chloris gayana Kunth	Rhodes grass	non-native	rare
Cynodon dactylon (L.) Pers.	mānienie	non-native	rare
Digitaria ciliaris (Retz.) Koeler	Henry's crabgrass	non-native	rare
Eleusine indica (L.) Gaertner	wiregrass	non-native	rare
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	non-native	uncommon
Megathyrsus maximus (Jacq.) Simon & Jacobs	Guinea grass	non-native	common
Melinis minutiflora P. Beauv.	molasses grass	non-native	rare
Melinis repens (Willd.) Zizka	Natal redtop	non-native	uncommon
Paspalum conjugatum Bergius	Hilo grass	non-native	uncommon
Paspalum dilatatum Poir.	Dallis grass	non-native	rare
Sorghum halapense (L.) Pers.	Johnson grass	non-native	rare
Sporobolus elongatus R.Br.	slender rat tail grass	non-native	rare
Stenotaphrum secundatum (Walter) Kuntze	St. Augustine grass	non-native	rare
Urochloa distachya (L.) T.Q. Nguyen	tropical signalgrass	non-native	rare
Urochloa mutica (Forssk.) T.Q. Nguyen	California grass	non-native	uncommon
STRELITZIACEAE (Bird-of-paradise Family)			
Ravenala madagascariensis Sonnerat	traveler's tree	non-native	rare
Strelitzia nicolai Regel & Kornicke	white-bird-of-paradie	non-native	uncommon
ZINGIBERACEAE (Ginger Family)			
Alpinia zerumbet (Pers.) B.L. Burtt & R.M. Smith	shell ginger	non-native	rare
DICOTS			
ACANTHACEAE (Acanthus Family)			
Asystasia gangetica (L.) T. Anderson	Chinese violet	non-native	rare
AMARANTHACEAE (Amaranth Family)			
Amaranthus spinosus L.	spiny amaranth	non-native	rare
Amaranthus viridis L.	slender amaranth	non-native	rare
ANACARDIACEAE (Mango Family)			
Mangifera indica L.	mango	non-native	rare
Schinus terebinthifolius Raddi	Christmas berry	non-native	uncommon
APOCYNACEAE (Dogbane Family)			
Allamanda cathartica L.	allamanda	non-native	rare
Nerium oleander L.	oleander	non-native	rare
Plumeria rubra L.	plumeria	non-native	rare
ARALIACEAE (Panax Family)			
Polyscias guilfoylei (W. Bull) L.H. Bailey	panax	non-native	uncommon
Schefflera actinophylla (Endl.) Harms	octopus tree	non-native	rare
ASTERACEAE (Sunflower Family)			
Ageratum conyzoides L.	maile hohono	non-native	uncommon
Bidens alba (L.) DC.	romerillo	non-native	uncommon
Bidens pilosa L.	Spanish needle	non-native	rare
Conyza bonariensis (L.) Cronq.	hairy horseweed	non-native	uncommon

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
Emilia fosbergii Nicolson	red pualele	non-native	rare
Pluchea carolinensis (Jacq.) G.Don	sourbush	non-native	rare
Sphagneticola trilobata (L.) Pruski	wedelia	non-native	rare
Tithonia diversifolia (W. Hensley) A. Gray	Mexican sunflower	non-native	rare
BIGNONIACEAE (Bignonia Family)			
Spathodea campanulata P. Beauv.	African tulip tree	non-native	rare
Tabebuia aurea (Silva Mango) S. Moore	silver trumpet tree	non-native	uncommon
Tabebuia heterophylla (A.P. de Condolle) Britton	pink tecoma	non-native	rare
BORAGINACEAE (Borage Family)			
Cordia subcordata Lamarck	kou	Polynesian	rare
CACTACEAE (Cactus Family)			
Hylocereus undatus (Haw.) Britton & Rose	night blooming cereus	non-native	uncommon
CARICACEAE (Papaya Family)			
Carica papaya L.	papaya	non-native	rare
CASUARINACEAE (She-oak Family)			
Casuarina equisetifolia L.	common ironwood	non-native	rare
CLUSIACEAE (Mangosteen Family)			
Clusia rosea Jacq.	autograph tree	non-native	uncommon
COMBRETACEAE (Indian Almond Family)			
Conocarpus erectus L.	buttonwood mangrove	non-native	rare
CONVOLVULACEAE (Morning Glory Family)			
Ipomoea batatas (L.) Lam.	sweet potato	Polynesian	rare
Ipomoea obscura (L.) Ker-Gawl.	obscure morning glory	non-native	uncommon
Ipomoea ochracea (Lindl.) G. Don	fence morning glory	non-native	uncommon
Ipomoea triloba L.	little bell	non-native	uncommon
CUCURBITACEAE (Gourd Family)			
Coccinea grandis (L.) Voight	ivy gourd	non-native	uncommon
Cucurbita moschata (Lam.) Poir.	kabocha pumpkin	non-native	rare
Lagenaria siceraria (Molina) Standly	long squash	non-native	rare
Momordica charantia L.	bitter melon	non-native	rare
EUPHORBIACEAE (Spurge Family)			
Aleurites moluccana (L.) Willd.	kukui	Polynesian	rare
Codiaeum variegatum (L.) Blume	croton	non-native	rare
Euphorbia hirta L.	hairy spurge	non-native	rare
Euphorbia hypericifolia L.	graceful spurge	non-native	rare
Euphorbia prostrata Aiton	prostrate spurge	non-native	rare
Euphorbia thymifolia L.	thyme-leaved spurge	non-native	rare
Jatropha integerrima Jacq.	rose-flowered jatropha	non-native	rare
Macaranga tanarius (L.) Mull. Arg.	parasol leaf tree	non-native	common
FABACEAE (Pea Family)			
Acacia confusa Merr.	Formosa koa	non-native	uncommon
Cajanus cajan (L.) Huth	pigeon pea	non-native	rare
Canavalia cathartica Thouars	maunaloa	non-native	rare
Cassia x nealiae H.S. Irwin & Barneby	rainbow shower	non-native	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
Chamaecrista nictitans (L.) Moench	partridge pea	non-native	uncommon
Crotalaria pallida Aiton	smooth rattlepod	non-native	uncommon
Desmodium incanum DC.	ka'imi clover	non-native	rare
Falcataria moluccana (Miq.) Barneby & Grimes	albizia	non-native	common
Indigofera suffruticosa Mill.	ʻinikō	non-native	rare
Leucaena leucocephala (Lam.) de Witt.	koa haole	non-native	uncommon
Macroptilium atropurpureum (DC.) Urb.	siratro	non-native	uncommon
Mimosa pudica L.	sensitive plant	non-native	rare
Neonotonia wightii (Wight & Arnott) Lackey	glycine	non-native	uncommon
Samanea saman (Jacq.) Merr.	monkeypod	non-native	rare
Sesbania grandiflora (L.) Poirot	katuday	non-native	rare
Tamarindus indica L.	tamarind	non-native	rare
LAURACEAE (Laurel Family)			
Cinnamomum burmanni (Nees) Blume	padang cassia	non-native	uncommon
Persea americana Mill.	avocado	non-native	rare
MALVACEAE (Mallow Family)			
Abelmoschus esculentus (L.) Moench	okra	non-native	rare
Corchorus olitorius L.	jute	non-native	rare
Hibiscus tiliaceus L.	hau	indigenous	rare
Sida ciliaris L.	bracted fanpetals	non-native	uncommon
Waltheria indica L.	ʻuhaloa	indigenous	uncommon
MELASTOMATACEAE (Melastoma Family)			
Clidemia hirta (L.) D.Don	Koster's curse	non-native	rare
MORACEAE (Mulberry Family)			
Artocarpus altilis (Z.) Fosberg	ʻulu	Polynesian	rare
Artocarpus heterophyllus Lamarck	jackfruit	non-native	rare
Ficus microcarpa L. fil.	Chinese banyan	non-native	rare
MORINGACEAE (Drumstick Tree Family)			
Moringa oleifera Lamarck	marunggay	non-native	rare
MYRTACEAE (Myrtle Family)			
Eucalyptus camaldulensis Dehnh.	river red gum	non-native	rare
Eugenia uniflora L.	surinam cherry	non-native	rare
Psidium cattleinam Sabine	strawberry guava	non-native	rare
Psidium guajava L.	common guava	non-native	rare
Szyzygium cumini (L.) Skeels	Java plum	non-native	rare
NYCTAGINACEAE (Four o'clock Family)			
Boerhavia coccinea Mill.	scarlet spiderling	non-native	rare
OLEACEAE (Olive Family)			
Jasminum sambac (L.) W. Aiton	pīkake	non-native	rare
OXALIDACEAE (Wood Sorrel Family)			
Averrhoa carambola L.	yellow wood sorrel	Polynesian	rare
Oxalis corniculata L.	star fruit	non-native	rare
PASSIFLORACEAE (Passion Flower Family)			
Passiflora edulis Sims	passion fruit	non-native	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
PHYLLANTHACEAE (Phyllanthus Family)			
Phyllanthus debilis Klein ex Willd.	niruri	non-native	uncommon
Phyllanthus tenella Roxb.	long-stalked phyllanthus	non-native	rare
PLANTAGINACEAE (Plantain Family)			
Plantago lanceolata L.	narrow-leaved plantain	non-native	uncommon
POLYGONACEAE (Buckwheat Family)			
Antigonon leptopus Hook. & Arnott	Mexican creeper	non-native	rare
PORTULACACEAE (Purslane Family)			
Portulaca oleracea L.	pig weed	non-native	rare
PROTEACEAE (Protea Family)			
Grevillea robusta A. Cunn. ex R. Br.	silk oak	non-native	rare
RUBIACEAE (Coffee Family)			
Morinda citrifolia L.	noni	Polynesian	rare
Richardia brasiliensis Gomes	----------	non-native	rare
Spermacoce assurgens Ruiz & Pav.	buttonweed	non-native	rare
SAPOTACEAE (Sapodilla Family)			
Chrysophyllum oliviforme L.	caimatillo, satinleaf	non-native	uncommon
SCROPHULARIACEAE (Figwort Family)			
Buddlea asiatica Lour.	dogtail	non-native	uncommon
SOLANACEAE (Nightshade Family)			
Solanum lycopersicum L.	tomato	non-native	rare
Solanum mauritianum Scop.	wooly nightshade	non-native	uncommon
URTICACEAE (Nettle Family)			
Cecropia obtusifolia Bertol.	guarumo	non-native	rare
VERBENACEAE (Verbena Family)			
Citharexylum caudatum L.	fiddlewood	non-native	common
Lantana camara L.	lantana	non-native	rare
Verbena litoralis Kunth	haʻuōwī	non-native	rare
ZYGOPHYLLACEAE (Creosote Bush Family)			
Tribulus terrestris L.	puncture vine	non-native	rare

FAUNA SURVEY REPORT

SURVEY METHODS

A fauna survey was conducted in conjunction with flora survey. All parts of the project area were covered. Observations were made with the assistance of binoculars. Notes were made of species, numbers and status as well as on tracks, scat and signs of feeding. An inventory was made of all of the animal species encountered.

In addition, an evening survey was conducted to observe crepuscular activities and calls, and to determine any occurrence of the Endangered ʻōpeʻapeʻa Hawaiian hoary bat (*Lasiurus cinereus semotus*) in the project area.

MAMMALS

Just one mammal was observed in the project area during the survey, the domestic dog (*Canis familiaris*). Taxonomy and nomenclature follow Tomich (1986). Other mammals likely to frequent this area include mice (*Mus domesticus*), rats (*Rattus* spp.), cats (*Felis catus*) and mongoose (*Herpestes auropunctatus*).

A special effort was made to look for the native Hawaiian hoary bat which is a federally listed Endangered species. An evening survey was conducted using both visual and electronic techniques. When present in an area these bats are clearly visible in the glow of twilight as they forage for insects that become active during evening hours. In addition, a bat detecting device (Batbox IIID) was used, set to the frequencies of 27,000 to 28,000 hertz which these bats use when echo-locating for flying insects. No evidence of presence of the Hawaiian hoary bat was detected at two sampling locations.

BIRDS

Birdlife was modest in both the number of species present and in the number of individuals seen. Ten species were observed including nine non-native species and one indigenous, migratory species, the kōlea or Pacific golden-plover (*Pluvialis fulva*). Taxonomy and nomenclature follow American Ornithologists' Union (2018). Most common were the zebra dove (*Geopelia striata*), the red-vented bulbul (*Pycnonotus cafer*) and the common myna (*Acridotheres tristis*). Less common were the cattle egret (*Bubulcus ibis*), the spotted dove (*Streptopelia chinensis*), the common waxbill (*Estrilda astrild*), the chicken (*Gallus gallus*) and the Japanese white-eye (*Zosterops japonicus*). The northern cardinal (*Cardinalis cardinalis*) and the kōlea were rare here.

A few other non-native birds may also occasionally use this property. The habitat, however, is not suitable for Oahu's native forest birds which are presently restricted to good quality native forests at higher elevations. The habitat is also not suitable for native seabirds such as Endangered ʻuaʻu (*Pterodroma sandwichensis*) and the Threatened ʻaʻo (*Puffinus auricularis newelli*) which nest in dense, wet fern shrubland near the summits of the mountains.

REPTILES

Just one reptile was seen during the survey, the brown anole lizard (*Anolis sagrei*). It is not native in Hawaii and was of rare occurrence here.

MOLLUSKS

One mollusk species, the giant African snail (*Achatina fulica*), was common in the project area. This large snail is not native here and is an agricultural pest.

INSECTS

Insect life was modest in both diversity of species and in total numbers. Ten species, representing five insect Orders, were observed during two site visits in the project area. Taxonomy and nomenclature follow Nishida et al (1992). Three species were common: the honeybee (*Apis mellifera*), the Southern house mosquito (*Culex quinquefasciatus*) and the long-tailed blue butterfly (*Lampides boeticus*). Three species were uncommon and four were rare here. None of the insects recorded are native to Hawaii.

DISCUSSION AND RECOMMENDATIONS

All of the mammals, reptiles, mollusks, insects and most of the birds recorded during the survey were not native species in Hawaii. Only the migratory kōlea is native during part of the year. These migratory plovers breed and raise their young on arctic tundra, then come to Hawaii and some other Pacific islands during the fall and winter months. Many thousands of these birds can be seen on all of the Hawaiian Islands in diverse habitats. They are quite common and are not on the Threatened or Endangered species lists.

No fauna in the project area are Threatened or Endangered species. No Critical Habitat for any Threatened or Endangered species occur in the project area or its vicinity.

The Endangered ʻuaʻu and the Threatened ʻaʻo, while not nesting in the project area, do fly over it during dusk to access their burrows high in the mountains and again at dawn to head out to sea. Young birds taking their first fledging flights are inexperienced fliers. They often are disoriented by bright lights and crash into light structures where they become vulnerable to injury and predators. It is recommended that any significant outdoor lighting associated with the proposed project be hooded to direct the light downward to mitigate this threat.

With the above recommended action, the proposed development project is not expected to have a significant negative impact on the fauna resources in this part of Oʻahu.

ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within five groups: Mammals, Birds, Reptiles, Mollusks and Insects. For each species the following information is provided:

1. Common name

2. Scientific name

3. Bio-geographical status. The following symbols are used:

   endemic = native only to Hawaii; not naturally occurring anywhere else in the world.

   indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

   migratory = bird species that spend the fall and winter months in Hawaii and the spring and summer months breeding in the arctic.

   non-native = all those animals brought to Hawaii intentionally or accidentally after western contact.

4. Abundance of each species within the project area:

   abundant = many flocks or individuals seen throughout the area at all times of day.

   common = a few flocks or well scattered individuals throughout the area.

   uncommon = only one flock or several individuals seen within the project area.

   rare = only one or two seen within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
MAMMALS			
CANIDAE (Wolf Family)			
Canis familiaris L.	domestic dog	non-native	rare
BIRDS			
ARDEIDAE (Heron Family)			
Bubulcus ibis L.	cattle egret	non-native	uncommon
CARDINALIDAE (Cardinal Family)			
Cardinalis cardinalis L.	northern cardinal	non-native	rare
CHARADRIIDAE (Plover Family)			
Pluvialis fulva Gmelin	Pacific golden-plover, kōlea	indigenous	rare
COLUMBIDAE (Dove Family)			
Geopelia striata L.	zebra dove	non-native	common
Streptopelia chinensis Scopoli	spotted dove	non-native	uncommon
ESTRILDIDAE (Estrildid Finch Family)			
Estrilda astrild L.	common waxbill	non-native	uncommon
PHASIANIDAE (Pheasant Family)			
Gallus gallus L.	chicken	non-native	uncommon
PYCNONOTIDAE (Bulbul Family)			
Pycnonotus cafer L.	red-vented bulbul	non-native	common
STURNIDAE (Starling Family)			
Acridotheres tristis L.	common myna	non-native	common
ZOSTEROPIDAE (White-eye Family)			
Zosterops japonicus Temmink & Schlegel	Japanese white-eye	non-native	uncommon
REPTILES			
IGUANIDAE (Iguana Family)			
Anolis sagrei Dumeril & Bibron	brown anole	non-native	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
MOLLUSKS			
ACHATINIDAE (Achatinid Snail Family)			
Achatina fulica Ferussac	giant African snail	non-native	common
INSECTS			
Order COLEOPTERA - beetles			
SCARABAEIDAE (Scarab Beetle Family)			
Protaetia orientalis Burmeister	Asian flower beetle	non-native	uncommon
Order DIPTERA - flies			
CULICIDAE (Mosquito Family)			
Culex quinquefasciatus Say	Southern house mosquito	non-native	common
MUSCIDAE (Housefly Family)			
Musca domestica L.	housefly	non-native	uncommon
Order HYMENOPTERA - bees, wasps, ants			
APIDAE (Honey Bee Family)			
Apis mellifera L.	honey bee	non-native	common
FORMICIDAE (Ant Family)			
Pheidole megacephala Fabricius	big-headed ant	non-native	uncommon
Order LEPIDOPTERA - butterflies, moths			
HESPERIIDAE (Skipper Buttterfly Family)			
Hylephila phyleus Drury	fiery skipper	non-native	rare
LYCAENIDAE (Gossamer-winged Butterfly Family)			
Lampides boeticus L.	long-tailed blue butterfly	non-native	common
NYMPHALIDAE (Brush-footed Butterfly Family)			
Agraulis vanillae L.	passion flower butterfly	non-native	rare
Order ORTHOPTERA - grasshoppers, crickets			
ACRIDIDAE (Grasshopper Family)			
Oedaleus abruptus Thunberg	short-horned grasshopper	non-native	rare
Oxya japonica Thunberg	small rice grasshopper	non-native	rare

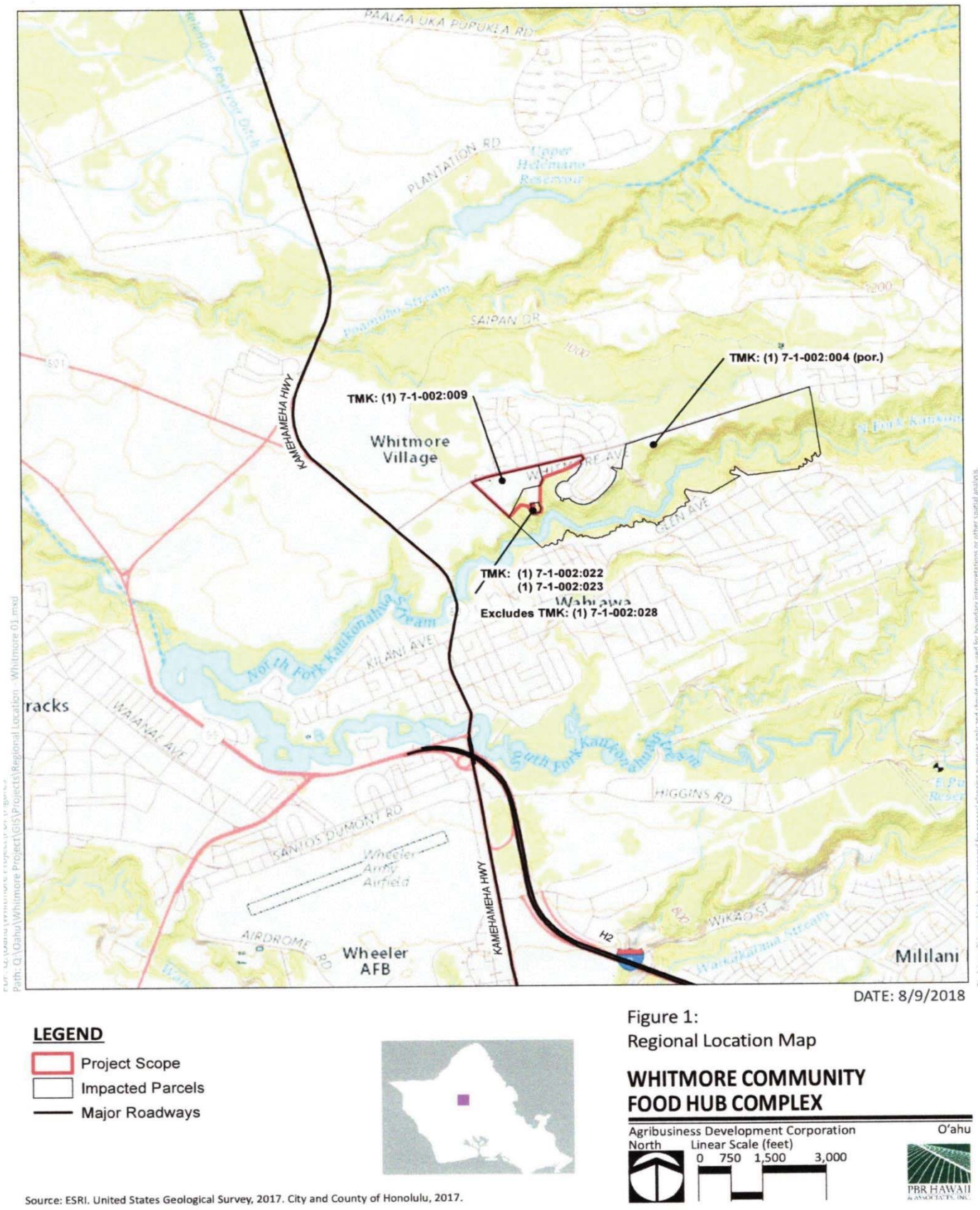


Figure 1. Regional Location Map - Whitmore Community Food Hub Complex



Figure 2. Project area – Whitmore Community Food Hub Complex



Figure 3. View east from western corner of project area showing old structure, lawn and diverse vegetation types.



Figure 4. View west showing old structure and diverse vegetation types.



Figure 5. View west from south central portion of the project area showing overgrown grasses. Large albizia trees are growing in a gully on the property.



Figure 6. View south showing some of the diverse experimental plantings in the old nursery.

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APPENDIX C

Historic Properties Inventory Survey



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Historic Properties Inventory Survey for the Whitmore Agricultural Project

TMKs: (1) 7-1-002:004 (por.) and 009

Wahiawā Ahupua'a
Wahiawā District
Island of O'ahu

DRAFT VERSION



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Historic Properties Inventory Survey for the Whitmore Agricultural Project

TMKs: (1) 7-1-002:004 (por.) and 009

Wahiawā Ahupua‘a
Wahiawā District
Island of O‘ahu

ASM affiliates

EXECUTIVE SUMMARY

At the request of Mr. Vincent Shigekuni of PBR Hawaii & Associates, ASM conducted a Historic Properties Inventory Survey of a roughly 37-acre property within Wahiawā Ahupuaʻa, Wahiawā District, Island of Oʻahu. The study area is owned by the Agribusiness Development Corporation (ADC) of Hawaiʻi, which plans to revitalize the local agricultural economy following the phasing out of the sugar and pineapple industries in recent years, by developing the Whitmore Agricultural Project. Components of the overall project include farmland; a warehouse; affordable housing; and an Agricultural Hub that will consist of an agricultural-industrial park to include food safety, processing and packaging facilities, and office space. ASM prepared this study to identify and determine the potential significance of any historic properties that may exist within the project area. The current study will accompany an Environmental Assessment being prepared in compliance with Hawaiʻi Revised Statues (HRS) Chapter 343, and has been prepared in accordance with Hawaiʻi Administrative Rules §13-275 as well as HAR §13-276. The archaeological fieldwork for the current study was conducted by Principal Investigator Robert Rechtman, Ph.D. with the assistance of Ryan Gross, M.A., and Deidra Moore, B.A. The architectural history evaluation portion was conducted by ASM architectural historians Marilyn Novell, M.S. and Shannon Davis, M.A., who meet the Secretary of the Interior's (SOI) Professional Qualifications Standards in both architectural history and history. As a result of the fieldwork for the current study, there were no archaeological sites encountered. Extensive modifications of the land within the study area was noted during the survey, including prior mass grading and the presence of underground utilities, building footprints, paved and unpaved roads and parking areas, and active agricultural plots. Twenty-seven buildings (twenty of which are older than fifty years) were identified, none of which are currently listed in either the National Register or the Hawaiʻi Register of Historic Places, and none are currently recognized by the Historic Hawaiʻi Foundation as historic properties. As a grouping, the buildings have been assigned State Inventory of Historic Places (SIHP) Site 50-80-04-xxxx. Although none of the buildings are individually significant under any criteria, collectively, Site XXXX is considered significant under Criterion d for the information generated as a result of the current study. However, no further mitigation work is recommended, as the current study has sufficiently documented the site. There were no archaeological resources identified within the current study area, and it is our conclusion that no further archaeological work needs to be conducted prior to, or during project implementation. In the unlikely event that significant archaeological resources are discovered during redevelopment activities, work in the area of the discovery would cease and DLNR-SHPD contacted pursuant to HAR §13-280-3. With respect to both archaeological and architectural resources, the effects determination for the proposed Whitmore Agricultural project is no historic properties affected.

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1. INTRODUCTION

At the request of Mr. Vincent Shigekuni of PBR Hawaii & Associates, ASM conducted a Historic Properties Inventory Survey of a roughly 37-acre property within Wahiawā Ahupua‘a, Wahiawā District, Island of O‘ahu. Both parcels are owned by the Agribusiness Development Corporation (ADC) of Hawai‘i, which plans to revitalize the local agricultural economy following the phasing out of the sugar and pineapple industries in recent years, by developing the Whitmore Agricultural Project (Project). Components of the overall Project include farmland; a warehouse; affordable housing; and an Agricultural Hub that will consist of an agricultural-industrial park to include food safety, processing and packaging facilities, and office space.

ASM prepared this study to identify and determine the potential significance of any historic properties that may exist within the project area prior to the proposed redevelopment of the site. The current study will accompany an Environmental Assessment (EA) being prepared in compliance with Hawai‘i Revised Statues (HRS) Chapter 343, and has been prepared in accordance with Hawai‘i Administrative Rules (HAR) §13-275 (Rules Governing Procedures for Historic Preservation Review to Comment on Section 6E-8, HRS, Projects) as well as HAR §13-276 (Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports).

The current report contains background information outlining the study area’s physical and cultural contexts, a summary of relevant previous studies conducted in the vicinity of the current study area, and survey expectations based upon the background information and the previous studies. Also presented is an explanation of the survey field methods, a description of the results of the fieldwork, and significance evaluations and recommendations for the identified historic resources.

STUDY AREA DESCRIPTION

The current study area is located in the Whitmore Village area, approximately 1.25 kilometers north of the town of Wahiawā (Figure 1). The study area comprises TMK: (1) 7-1-002:009 and a portion of the adjacent TMK: (1) 7-1-002:004 (Figure 2), and is bound by Whitmore Avenue (State Route 804) and existing residential developments to the north and east, a privately-owned commercial property to the west, and an unnamed drainage of the north fork of Kaukonahua Stream to the south (Figure 3). The roughly 37-acre study area is former pineapple plantation land, and is currently an industrial facility that includes warehouse, administrative, and maintenance buildings, many of which have fallen into disuse, along with paved and unpaved roads and parking lots (Figures 4, 5, and 6). Current lessees on the property include agricultural suppliers, a tow yard, and a stone countertop factory, as well as administrative offices of the Dole Food Company.

The property is accessed from four entrances off Whitmore Avenue; two are located on the eastern and western ends of the property, one is at the junction of Ihiihi and Whitmore Avenues, and one is between Lalawai Street to the northwest and Ehoeho Avenue to the northeast. The latter entrance is marked by a boulder etched with “Dole Wahiawa Planation” set amid a variety of naturalistically planted shrubs (Figure 7). The entrance at Ihiihi Avenue is gated (Figure 8). The residential area of Whitmore Village north of Whitmore Avenue beyond the current study area consists mostly of single-story single-family houses (Figures 9 and 10) on a curvilinear street pattern.

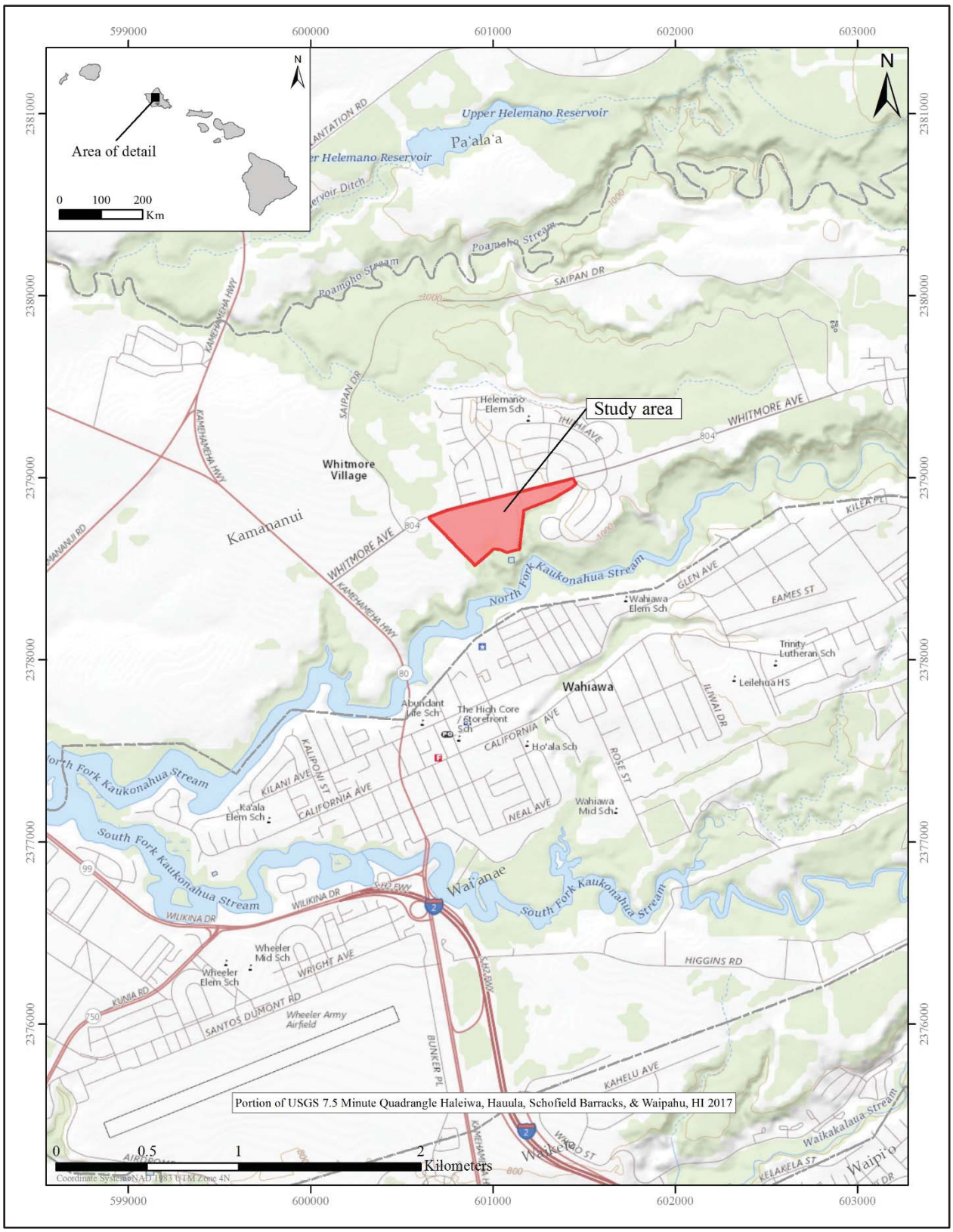


Figure 1. Study area location.

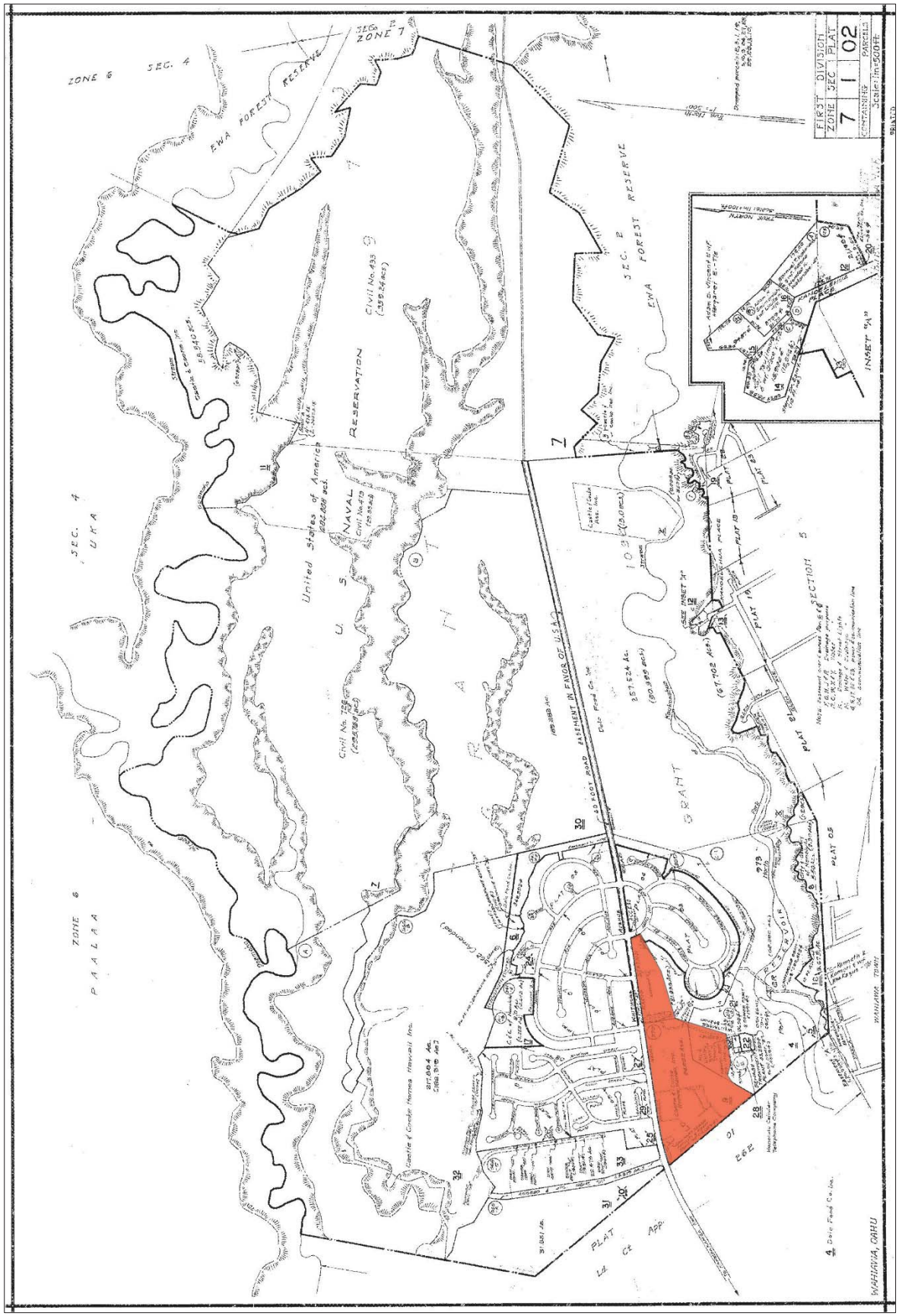


Figure 2. Tax Map Key (1) 7-1-002 showing location of current study area parcels (009 and portion of 004).



Figure 3. Google Earth™ satellite image showing study area location (outlined in red).



Figure 4. Parking shed in paved area along northern study area boundary, view to the northwest. Homes in background are located on the opposite (north) side of Whitmore Avenue, outside the study area.



Figure 5. Paved entrance into study area on right, taken from the junction of Whitmore and Ihiihi Avenues, view to the southeast.



Figure 6. Unpaved roads and lawn area in central portion of study area, view to the north toward Whitmore Avenue.



Figure 7. Marker at entrance to current Dole offices south of Whitmore Avenue, view to the south.



Figure 8. Entrance to study area that is an extension of Ihiihi Avenue, view to the south.



Figure 9. Lalawai Street from the junction of Whitmore Avenue, view to the north.



Figure 10. Kulia Street from the junction of Whitmore Avenue, view to the north.

Geology, Soils, and Climate

Whitmore Village is situated on the east end of the central O‘ahu Plain, on gently-sloping tablelands at the base of the western flank of the Ko‘olau Mountain Range. Two extinct shield volcanoes began forming the island of O‘ahu around four million years ago, Ko‘olau being the younger of the two. Deep, V-shaped valleys were formed by lava flows and erosional processes over millions of years along the western margin of the Ko‘olau Caldera, creating a wide valley between the Ko‘olau and the older Wai‘anae Range to the west.

The subsurface geology of the study area is classified as Pleistocene-aged Ko‘olau Basalt (*Qtid*) (Sherrod, *et al.* 2007). Soils mapped within the study area include Wahiawa silty clay (*WaA*, 0 to 3 percent slopes), Helemano silty clay (*HLMG*, 30 to 90 percent slopes), Leilehua silty clay (*LeB*, 2 to 6 percent slopes), and Kolekole silty clay loam (*KuB/KuD*, 1 to 6 and 12 to 25 percent slopes, respectively); Wahiawa silty clay comprises more than 67% of the study area, and is classified as prime farmland, if irrigated (United States Department of Agriculture 2018). Other mapped soil types occur primarily along the drainage, which forms the southern boundary of the study area (Figure 11). Elevation within the study area ranges from approximately 935-1005 feet above mean sea level.

The climate of the study area is classified as tropical, with a mean annual average precipitation of 1128 mm (44 inches) recorded between 1971 and 2000 (Western Regional Climate Center 2012). Average annual temperatures during the same period ranged from 62 to 81 degrees Fahrenheit (ibid.). Vegetation within the study area consists of landscaped lawn areas and tree plantings including African tulip, palm, Norfolk pine, Paper bark, Christmas berry, Koa, avocado and mango trees. Agricultural plots of taro, papaya, breadfruit, and a fruit tree orchard are located in the southern half the property (Figure 12). Vegetation within the gulch along the southern boundary of the property is not maintained and includes a variety of non-native species (Figure 13). A row of Norfolk pine trees marks the western (Figure 14) and southeastern (Figure 15) boundaries of the property. Several mature Monkey pod trees dominate the landscape at the center of the property, and dirt roads connect the various buildings throughout the property (Figures 16, 17, and 18).

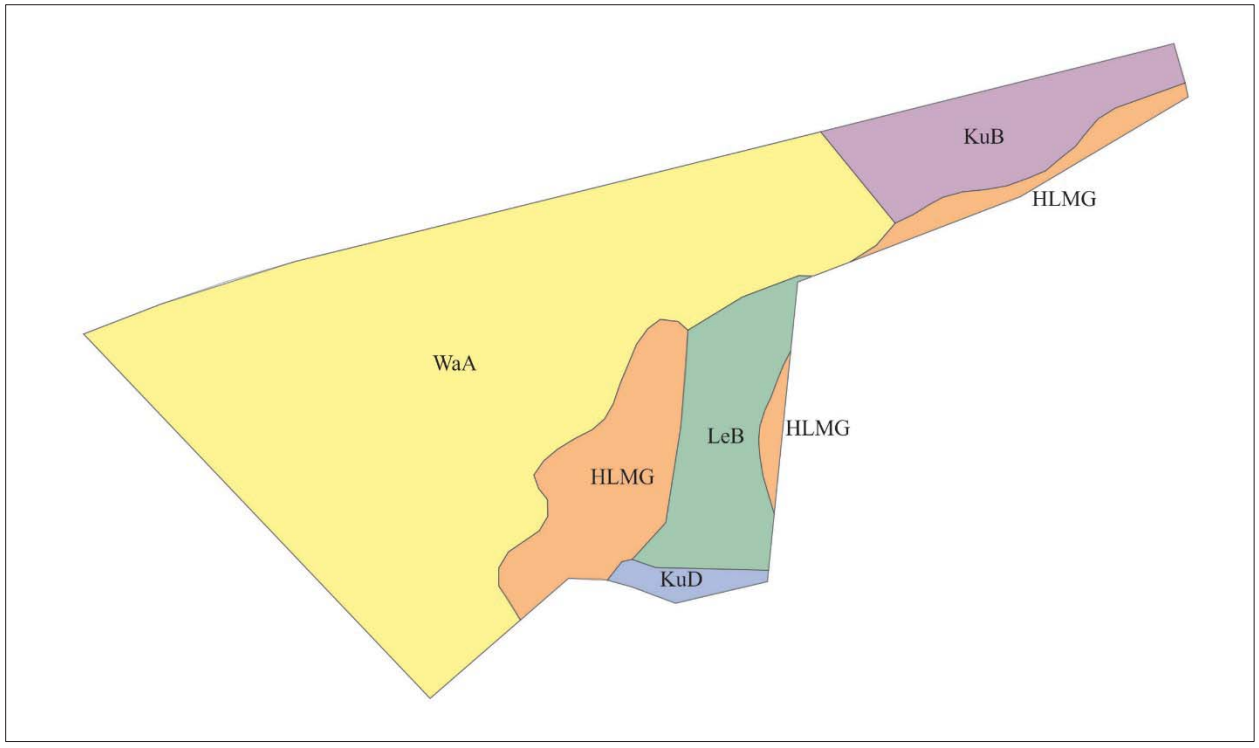


Figure 11. Soils in the current study area.



Figure 12. Palm trees facing a small orchard of fruit trees in southwestern portion of study area, view to the south.



Figure 13. Dense vegetation along southern study area boundary just beyond corrugated steel storage building, view to the southeast.



Figure 14. Entrance into the property at western end of study area showing row of Norfolk pines, view to the south.



Figure 15. Southeastern boundary of project area showing row of Norfolk pines, view to the southwest.



Figure 16. Overview of Parcel 9 portion of central study area, view to the west.



Figure 17. Overview of central study area showing dirt roads, view to the east toward Parcel 4.



Figure 18. Buildings along roadway with Parcel 4 portion of study area, view to the west.

2. BACKGROUND

To generate a set of expectations regarding the nature of historic properties, both archaeological and architectural that might be encountered within the current study area, and to establish an environment within which to assess the significance of any such resources, a general culture-historical context for the Wahiawā/Waialua/Waiʻanae District interface that includes specific information regarding the known history of Wahiawā Ahupuaʻa and the study area is presented. This is followed by a discussion of relevant prior archaeological studies conducted in the vicinity of the study area.

CULTURE-HISTORICAL CONTEXT

The current study area is located within the traditional District of Waialua, which is one of six traditional *moku* or *kalana* (districts) that together make up the Island of Oʻahu. Consisting of fourteen distinct *ahupuaʻa*, Waialua District encompasses a significant portion of the north shore and south/southeast portion of the Central Oʻahu Plain. Wide inland valleys make up the eastern portion of Waialua, which extend up the western flank of the Koʻolau Mountain Range, while the western half of the *moku* comprises deep, V-shaped valleys along the eastern margin of the Waiʻanae Mountain Range. In interpreting the name Waialua, Thrum (in Sterling and Summers 1978:88) translated it as "two waters" which is believed to originate from the two streams found in this district. Thrum (ibid.) further explains that the name may have derived from a famed taro patch in this district. Pukui (ibid.) however, explains that the district name was given after the cruel chief Waia, who was the grandson of Wākea carried out his evil deeds at Waialua which caused much suffering for the people. Pukui translated the name to mean "doubly disgraceful," *waia* (disgraceful) and *lua* (double) (ibid.). Awai (ibid.) associates the district name to Waialua Pool found in the *ʻili ʻāina* of Kemoʻo.

Within the southernmost portion of traditional Waialua District is Kamananui Ahupuaʻa, a land division that extends from the western side of the Koʻolau Mountains and terminates at the coast near Kaiaka Bay located along the north shore of the island (Figure 19). The name Kamananui has been translated by Pukui et al (1974:80) as "the large branch." Pukui et al. (ibid.) adds that "[a] forest grove here was called Pō-loa (long night). Kamananui Ahupuaʻa is bounded on the north by Paʻalaʻa Ahupuaʻa and to the south lies Waiʻanae Uka Ahupuaʻa, and land division within the Waiʻanae District (see Figure 19).

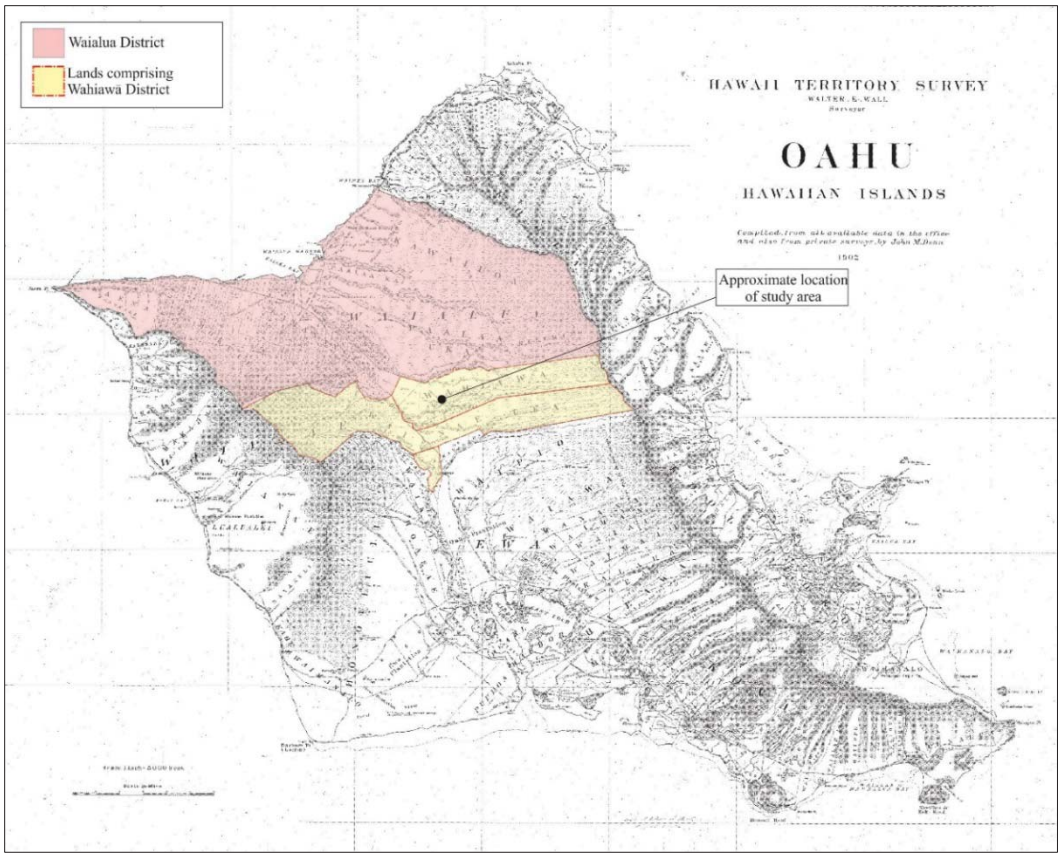


Figure 19. Hawai‘i Registered Map 2374 (W.E. Wall) from 1902 showing Waialua District and lands comprising Wahiawā District with study area.

The traditional boundaries forming the eastern section of Kamananui Ahupua‘a have a complex history that is tied to the advent of Hawai‘i’s legislative government about 1846 (King in Coulter 1935) and is connected to the formation of the land area known as Wahiawā. Principal Cadastral Engineer for the Territory of Hawai‘i, Robert D. King explains some of the reasons for the changing boundaries:

> Some of these changes were made for political reasons and others for convenience, but the principal changes in boundaries were caused by movements in population reflecting new uses of the land areas. These new district boundaries did not always conform to the *ahupuaa* boundary and there are examples today of an *ahupuaa* being situated in more than one district where no such condition existed in ancient times. (King in Coulter 1935:214)

According to Soehren (2008), the land locked *ahupua‘a* of Wahiawā (Figure 20) was not named or claimed in the 1848 *Māhele ‘Āina*—the land division process that established fee simple ownership of Hawaiian lands. In 1850, Wahiawā, which was reported to be within Waialua District, was designated school lands, which were to be sold in support of public schools. In 1852, portions of Wahiawā Ahupua‘a were sold as grants to James Robinson, Robert Lawrence, & Robert W. Holt (Royal Patent Grant 973 for 1,942 acres) and to Pa‘aluhi (Royal Patent Grant 1092 for 186 acres) (Soehren 2008). Boundary Commission adjudications in 1869 placed Wahiawā Ahupua‘a within Wai‘anae District; and subsequent legislative changes enacted in 1909 altered the boundaries of Waialua District again by adding Waimea Ahupua‘a, which was formerly within Ko‘olauloa District and the *mauka* portion of Wai‘anae Ahupua‘a (known as Wai‘anae Uka) and Wahiawā Ahupua‘a, which were formerly in Wai‘anae District. These boundaries prevailed until 1913 when the new Wahiawā District was added. This new district was formed by taking the eastern portion of Kamananui Ahupua‘a, Wahiawā Ahupua‘a, and Wai‘anae Uka from Waialua to form the seventh district of O‘ahu (King 1935). In detailing the events that led to the creation of the Wahiawā District, King explains:

> In 1899, a tract of some 1320 acres of Wahiawa, formerly in pasture, was subdivided into agricultural homestead lots and by 1913 quite a community had developed in this section whose aspirations for independence from Waialua district were met by the creation of a new district. (King 1935:221)

McElroy et al. (2015:6) reports that "[i]n 1925 the size of Waialua District was reduced as large plots of land were transferred to Wahiawā. However, in 1932 the original 1913 land boundaries were reinstated, with some small parcels added to the Schofield Barracks Military Reservation." Pukui et al. (1974:218) translated the name Wahiawā as "place of noise" and added that "rough seas are said to be heard here." Accordingly, Handy and Handy (1972), further explain that the sound of rough seas were said to be carried inland from the coast.

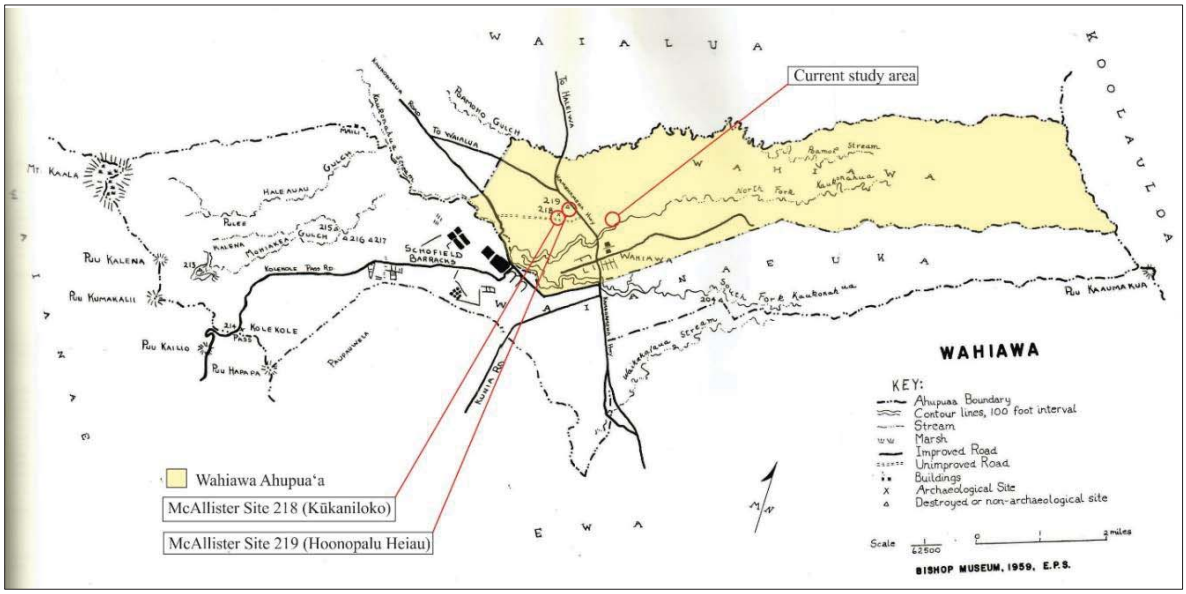


Figure 20. Sites of O'ahu (Sterling and Summers 1978) map showing study area located in Wahiawā Ahupua'a.

Writing in *The Hawaiian Planter*, E.S. Craighill Handy describes agricultural terraces that were once located in the Wahiawā area, along the flatlands in the Poamoho and Kaukonahua Valleys in the vicinity of the study area. While Poamoho was "probably too narrow for taro terraces", it was "likely that in these gulches, as at Waimea, sweet potatoes and bananas were planted around home sites along the ridge and near taro patches at the bottom of the gulch." (Handy 1940:85). Handy also suggests that the Wahiawā area must have supported a "sizeable" Precontact Hawaiian population, based on the areas of *lo'i* and the extensive sweet-potato and yam plantations (Handy & Handy 1972:465). It is within this general context that the following discussion of the history of the study area is framed.

Early Hawaiian Settlement Patterns

While the question of the timing of the first settlement of the islands of Hawai'i by Polynesians remains unanswered, several theories have been offered that derive from various sources of information (i.e., archaeological, genealogical, mythological, oral-historical, radiometric). However, none of these theories is today universally accepted because there is no archaeological evidence to support the proposed timing for the initial settlement, or colonization stage of island occupation. More recently, with advances in palynology and radiocarbon dating techniques, Kirch (2011) and others (Athens et al. 2014; Wilmshurst et al. 2011) have convincingly argued that Polynesians arrived much later in the Hawaiian Islands, sometime between A.D. 1000 and A.D. 1200 and expanded rapidly thereafter (c.f., Kirch 2011).

The initial settlement of Hawai'i is believed to have originated from the southern Marquesas Islands. In these early times, Hawai'i's inhabitants were primarily engaged in subsistence level agriculture and fishing (Handy et al. 1991). The Settlement Period was a time of great exploitation and environmental modification, when early Hawaiian farmers developed new subsistence strategies by adapting their familiar patterns and traditional tools to their new environment (Kirch 1985; Pogue 1978). Their ancient and ingrained philosophy of life tied them to their environment and kept order; which was further assured by the conical clan principle of genealogical seniority (Kirch 1984). According to Fornander (1969), the Hawaiians brought certain universal Polynesian customs and beliefs from their homeland, such as the major gods Kāne, Kū, and Lono; the *kapu* system of law and order; cities of refuge; the *'aumakua* concept; and the concept of *mana*.

Initial permanent settlements in the islands were established at sheltered bays with access to fresh water and deep sea fisheries. The near shore fisheries and coastal fishponds, which were enriched by nutrients carried in the fresh water, also offered opportunities for resource extraction and stewardship. Communities shared extended familial relations and there was an occupational focus on the collection of marine resources. Clusters of houses were found in

these coastal areas where, over time, agricultural production first became established. Over a period of several centuries, the areas with the richest natural resources became populated and perhaps even crowded, and inland elevations began to be used for agriculture and some habitation. Meanwhile, an increasing separation of the chiefly class from the common people began to emerge. As the environment reached its maximum carrying capacity, the result was social stress, hostility, and war between neighboring groups (Kirch 1985). Soon, large areas of the Hawaiian Islands were controlled by a few powerful chiefs.

As time passed, a uniquely Hawaiian culture developed. The portable artifacts found in archaeological sites from the Developmental Period reflect not only an evolution of traditional tools, but some distinctly Hawaiian inventions. The adze (*koʻi*) evolved from the typical Polynesian variations of plano-convex, trapezoidal, and reverse-triangular cross-section to a very standard Hawaiian rectangular quadrangular tanged adze. The two-piece fishhook and the octopus-lure breadloaf sinker are Hawaiian inventions of this period, as are *ʻulu maika* stones and *lei niho palaoa*. The latter was a status item worn by those of high rank, which indicates a trend toward greater status differentiation (Kirch 1985).

As the population continued to expand so did social stratification. By this time, most of the ecologically favorable zones of the windward and coastal regions of the major islands were settled, and the more marginal leeward areas were being developed. The greatest population growth occurred during the Expansion Period. It was during the Expansion Period that a second major migration settled in Hawaiʻi, this time from Tahiti in the Society Islands. The Expansion Period was characterized by major socioeconomic changes, intensive land modification, and the development of complex social hierarchies (Kirch 1985). Monumental architecture, such as *heiau* (religious temples), "played a key role as visual markers of chiefly dominance" (Kirch 1990:206).

The island of Oʻahu appears to have been divided into six traditional districts during the Expansion Period. The *moku* were further divided into distinct land units known as *ahupuaʻa*, the current study area being situated within Wahiawā *ahupuaʻa*, as previously mentioned. According to Kirch's (1985) model, the concept of the *ahupuaʻa* was established sometime during the A.D. 1400s, adding another component to a then well-stratified society. The implications of this model include a shift in residential patterns from seasonal, temporary occupation, to permanent dispersed occupation of both coastal and upland areas. This land unit became the equivalent of a local community, with its own social, economic, and political significance. *Ahupuaʻa* were usually wedge or pie-shaped, incorporating all of the eco-zones from the mountains to the sea and for several hundred yards beyond the shore, assuring a diverse subsistence resource base (Hommon 1986). This form of district subdividing was integral to Hawaiian life and was the product of strictly adhered to resource management planning. In this system, the land provided fruits and vegetables and some meat for the diet, and the ocean provided a wealth of protein resources (Rechtman and Maly 2003). *Ahupuaʻa* were further divided into smaller sections such as *ʻili, moʻoʻāina, paukūʻāina, kīhāpai, kōʻele, hakuone*, and *kuakua* (Hommon 1986, Pogue 1978).

Ahupuaʻa were generally under the jurisdiction of an *aliʻi-ʻai-ahupuaʻa* (chief who controlled the *ahupuaʻa* resources), assisted by their appointed *konohiki*, (lesser chief). The *aliʻi-ʻai-ahupuaʻa* in turn answered to an *aliʻi-ʻai-moku* (chief who claimed the abundance of the entire district). Thus, *ahupuaʻa* resources supported not only the *makaʻāinana* (commoners) and *ʻohana* (families) who lived on the land, but also contributed support to the ruling class of higher chiefs and ultimately the crown. The *aliʻi* and the *makaʻāinana* were not confined to the boundaries of an *ahupuaʻa*; when there was a perceived need, they also shared with their neighbor *ahupuaʻa ʻohana* (Hono-ko-hau 1974).

The boundaries of Kamananui *Ahupuaʻa* were revised following the establishment in 1913 of the Wahiawā District as Oʻahu's seventh *moku*, which reallocated the nearby *ahupuaʻa* of Wahiawā and Waiʻanae Uka from the Waialua District to the Wahiawā District (Sterling and Summers 1976:134). This change created a new, landlocked district (McElroy et al. 2014) which would have included the current study area (see Figure 11), while Kamananui *Ahupuaʻa* remained within the Waialua District to the north. At that time, the southern boundary of the Waialua District was Poamoho Gulch (see Figure 11), however, current mapping shows Kaukoahuna Gulch, approximately two kilometers south of Poamoho, as the southern boundary of the Waialua District. The current study area has thus been located within two separate districts at different points in time.

Historical Accounts

Historian John Papaʻī'ī (1800-1870) recounted the extensive trail networks throughout leeward Oʻahu in the early 19th century in *Fragments of Hawaiian History*, a compilation of his writings originally published between 1866 and 1870 for the *Ka Nupepa Kuokoa* Hawaiian language newspaper. ʻIʻī described a major trail, generally following the current

alignments of several state and federal highways, which traversed the Oʻahu Plain through the Wahiawā region, stopping at a sacred site in central Oʻahu, Kūkaniloko (see Figure 11):

> "From the stream of Anahulu and from Kamani, above the houses and taro patches, a trail stretched along in front of Kuokoa's house lot and the church. This trail went on to meet the creeks of Opaeula and Halemano, the sources of the stream of Paalaa, on down to the stream of Poo a Moho, and on to the junction where the Mokuleia trail branched off to Kamananui and Keawawahie, to Kukaniloko, the birthplace of chiefs" (Ii 1959:98).

It was under Kamehameha I's regency in the early 1800s that Hawai'i began its participation in the sandalwood trade. Historian Samuel Kamakau described the forested regions of the Wahiawā area as a source of some of the "largest trees" of the valuable timber species (Kamakau 1987:207), which was mainly exported to China through the 1830s by which time the region had been effectively deforested. Writing in 1916, Serano Edwards Bishop, a missionary and amateur geologist who frequented the region, recounted local Hawaiians' descriptions of the area as follows: "a forest formerly covered the whole of the then nearly naked plains" (Bishop 1916:45).

By the mid-19th Century, imported diseases had ravaged the Hawaiian population throughout Oʻahu, and increased foreign economic interests led to changes in traditional land use practices, which combined had a devastating affect on traditional Hawaiian culture.

The *Māhele ʻĀina* of 1848

The socioeconomic and demographic changes that took place in the years between 1790 and the 1840s, promoted the establishment of a Euro-American style of land ownership, and the *Māhele* of 1848 became the vehicle for determining ownership of native lands. As a result of the *Māhele*, land interests of the King (Kamehameha III), the high-ranking chiefs, and the *konohiki* were defined. The chiefs and *konohiki* were required to present their claims to the Land Commission to receive awards for lands provided to them by Kamehameha III. The lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission and speeded the transfers (Chinen 1961).

Prior to the 1848 *Māhele,* Kamananui Ahupuaʻa (also referred to as Mananui) was held by chiefess Victoria Kamāmalu. However, she did not claim Kamananui during the *Māhele*, and the *ahupuaʻa* was claimed as Crown Land by Kauikeaouli (Kamehameha III), and later relinquished to the government.

As the *Mōʻī* and *aliʻi* made claims to large tracts of land during the *Māhele*, questions arose regarding the protection of rights for the native tenants. To address this matter, on August 6, 1850, the *Kuleana* Act or Enabling Act was passed, allowing native tenants to claim a fee simple title to any portion of lands which they physically occupied, actively cultivated, or had improved (Garavoy 2005). Additionally, the *Kuleana* Act clarified rights to gather natural resources, as well as access rights to *kuleana* parcels, which were typically land locked. Lands awarded through the *Kuleana* Act were, and still are, referred to as *kuleana* awards or *kuleana* lands. The Land Commission oversaw the program and administered the *kuleana* as Land Commission Awards (Chinen 1958). Native tenants wishing to make a claim to their lands were required to submit a Native Register to the Land Commission, followed by Native Testimony given by at least two individuals (typically neighbors) to confirm their claim to the land. Upon successful submittal of the required documents, the Land Commission rendered their decision, and if successful, the tenant was issued the Land Comission Award (LCAw).

Unlike the *Māhele* between the chiefs, native tenants claiming land through the *Kuleana* Act were required to pay for a Government surveyor to survey and map the boundaries of the awarded parcels. Although no *kuleana* awards were recorded within the current project area, such awards were issued on lands adjacent to the study area. The information recorded in the Native Testimonies provides insight into land use and settlement patterns prior to the *Māhele*, while the Land Commission Awards reflect the results of this newly established land tenure system, both of which are discussed in the following paragraphs.

According to the Waihona ʻĀina Database, twenty-seven *kuleana* claims were made within the Kamananui Ahupuaʻa, of which only two were awarded. Both awarded lands are located well *makai* of the current study area. A review of the documents associated with the *kuleana* claims process (i.e. Native and Foreign Register; Native and Foreign Testimony) retrieved from the Office of Hawaiian Affairs (OHA) Papakilo Database indicated that LCAw. 248 was awarded to Joseph Thomas. Thomas received his land in 1818 from Kahekili Keʻeaumoku (also known as George Cox), an *aliʻi* and younger brother of high chiefess and wife of Kamehameha I, Kaʻahumanu (Kameʻeleihiwa 1992). The portion of his land along the banks of the "Mananui River" was cultivated with *kalo*. Testimonies given identified that Thomas' land, in the *ʻili* of Hihimanu, contained a large plain that was utilized for pasture and a valley known to contain an old fish pond.

The second *kuleana* award in Kamananui, which was granted under unique circumstances was awarded to Louis Gravier as LCAw. 692. Gravier testified that his land, in the *'ili* of Paukauila, was given to him by Governor Kuakini sometime between 1837 and 1838. However, during the *kuleana* claims process, a dispute was brought forth to the Board of Commissioners by the *konohiki* of the land, Kekūanāoʻa. Kekūanāoʻa stated that Governor Kuakini had no right to give land to Gravier with *konohiki* consent. Additionally, Kekūanāoʻa testified that the land was never given to Gravier in its entirety and that his claim should exclude four lots named Kahilikia (15 acres), Piikalauae (2 acres), a Catholic School House lot (2 acres), and Poloa (1 acre). Although not explicit in the records, it appears that Kekūanāoʻa had an interest in these lots. In tracking the development of Gravier claim, it seems as though he attempted to claim lands through the *Kuleana* Act, however, his claim was contested and the Board of Commissioners instead awarded him a *Māhele* Award (MA 692) constituting 615 acres in Kamananui as a "life estate" whereupon his death, the 615 acres reverted back to the government. Descriptions of land use is limited but the survey map produced by J. Metcalf in March of 1848 shows a portion of his land to contain an area used for cattle and showed the coastal Government Road.

Post-*Māhele* Government Granting Program

In conjunction with the *Māhele'Āina* of 1848, the King had authorized the issuance of Royal Patent Grants to applicants for tracts of land, larger than those generally available through the Land Commission. The process for applications was clarified by the "Enabling Act," which was ratified on August 6, 1850. The Act resolved that portions of the Government Lands established during the *Māhele* should be set aside and sold as grants. The stated goal of this program was to enable native tenants, many of whom were not awarded *kuleana* parcels during the *Māhele*, to purchase the lands upon which they lived, or land that they felt they could cultivate (Maly 1999). Despite the stated goal of the grant program many of the Government Lands were eventually sold to foreigners.

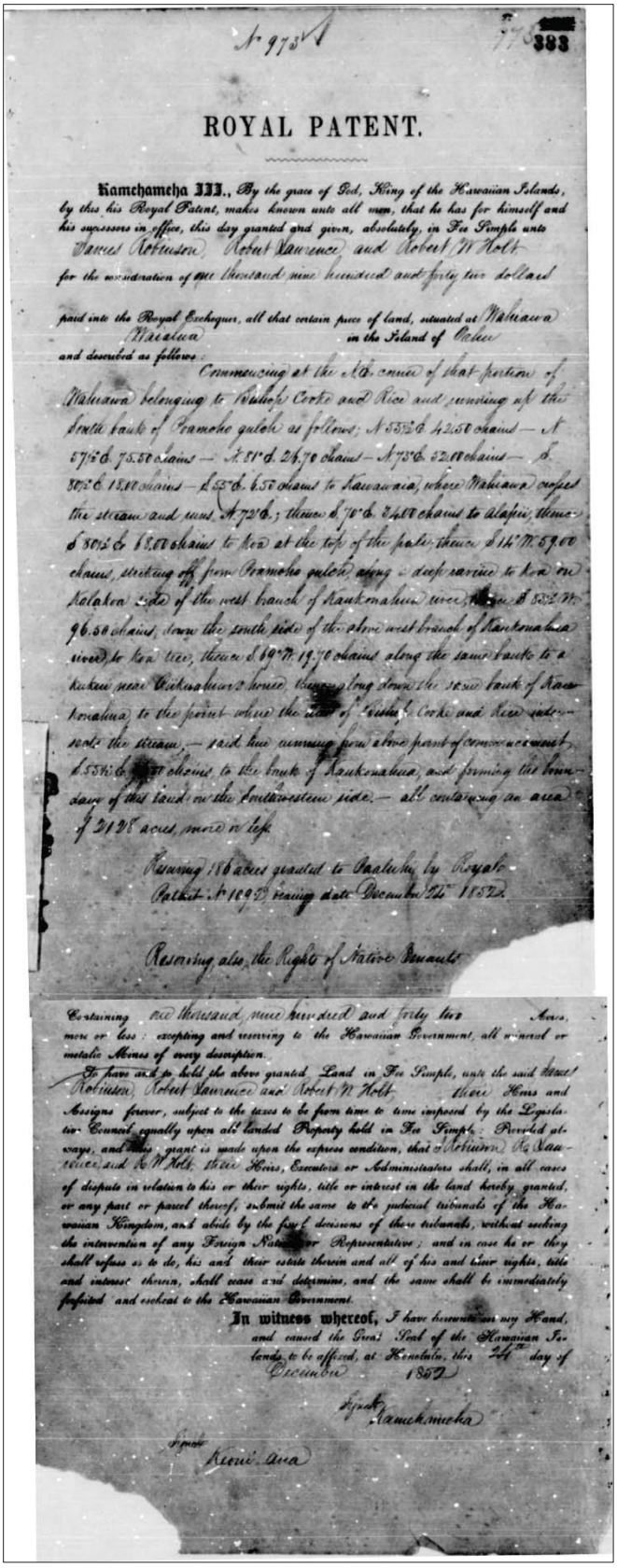
In 1852, the current study area was sold as part of Grant 973 to James Robinson, Robert Lawrence, & Robert W. Holt. Grant 973 encompassed a total of 1,942 acres in Kamananui/Wahiawā area (Figures 21 and 22). Much of this acreage was soon leased to the newly-established Waialua Agricultural Company, which cultivated pineapples and sugarcane in the Wahiawā region (Figure 23).

The Pineapple Industry in Wahiawā

According to a University of Hawaii research publication titled *Land Utilization in the Hawaiian Islands*, eighty to eighty-five percent of the world's pineapple production originated in Hawaii (Coulter 1933:88); "Hawaii is the pineapple's paradise, for here it thrives best and attains that sweetness and lusciousness of flavor not present in the pineapples grown in other lands" (ibid.). The first pineapple venture was initiated by Americans Kidwell and Emmeleuth, on 140 acres of leased land near Pearl Harbor during the 1880s (Taylor et al. 1976:163). By 1892, Kidwell had 100,000 plants and organized the Hawaiian Fruit and Packing Company; however, the neighboring Ewa sugar plantation's management persuaded Kidwell to switch to sugarcane—a venture that failed and allowed for Ewa plantation to take back the land (ibid.).

Pineapple cultivation was originally brought to the study area vicinity by a man by the name of Byron O. Clark, who was the Territorial Commissioner of the Board of Agriculture and Forestry and "helped bring 13 southern California families to Wahiawa to homestead" (Bartholomew et al. 2012:1391). Clark had found some discarded pineapple plants near Kidwell's abandoned farm and took them home to Wahiawā, where he planted them in rows (Taylor et al. 1976). Thus, Clark proved that pineapple is a rather hardy and adaptable fruit, "raised at sea level, at an altitude of 3,000 feet, in soils with much potash, in soils with little potash, in semi-arid areas without irrigation, and in areas having a rainfall of 60 inches" (Coulter 1933:89), although most pineapple cultivation on Oʻahu was located at elevations between 500 and 1,000 feet above sea level (ibid.).

Dole Food Company, Inc., was founded in 1851 in part by missionaries Samuel Northrup Castle and Amos Starr Cooke, who built their partnership into Castle & Cooke, one of the major agricultural companies in territorial Hawaii. Another part of the Dole Food Company began as the Hawaiian Pineapple Company, founded in 1901 by James Dole, who purchased 61 acres in Wahiawa and began experimenting with pineapple production in the central plateau of Oahu. Dole served as president of Hawaiian Pineapple Company from 1903 to 1932 (Brief History n.d.).



N° 973 A

383

ROYAL PATENT.

Kamehameha III., By the grace of God, King of the Hawaiian Islands, by this his Royal Patent, makes known unto all men, that he has for himself and his successors in office, this day granted and given, absolutely, in Fee Simple unto James Robinson, Robert Lawrence and Robert W Holt for the consideration of one thousand nine hundred and forty two dollars paid into the Royal Exchequer, all that certain piece of land, situated at Waluawa Waialua in the Island of Oahu and described as follows:

Commencing at the N.E. corner of that portion of Waluawa belonging to Kuihelo Cooke and Rice and running up the South bank of Poamoho gulch as follows: N 55½ E. 42.50 chains — N 57½ E. 75.50 chains — N 81° E. 24.70 chains — N 73° E. 32.00 chains — E 80½ E 15.00 chains — E 55° E. 6.50 chains to Kawawaia, where Waluawa crosses the stream and runs N 73° E.; thence E 70° E. 2.50 chains to Alapio; thence E 80½ E 8.00 chains to koa at the top of the pali; thence S 14° W. 59.00 chains, striking off from Poamoho gulch along a deep ravine to koa on Kalaloa side of the west branch of Kaukonahua river; thence S 83° W. 96.50 chains, down the south side of the above west branch of Kaukonahua river to koa tree, thence S 19° W. 19.70 chains along the same bank to a kukui near Keikuahuas house, thence along down the south bank of Kaukonahua to the point where the line of Kuihelo Cooke and Rice intersects the stream, — said line running from above point of commencement S 55½ E [illegible] chains to the bank of Kaukonahua and forming the boundary of this land on the Southwestern side, — all containing an area of 212⅝ acres, more or less.

Reserving 186 acres granted to Paaluhi by Royal Patent N° 1095 bearing date December 7th 1852.

Reserving also the Rights of Native Tenants

Containing one thousand nine hundred and forty two Acres, more or less: excepting and reserving to the Hawaiian Government, all mineral or metallic Mines of every description.

To have and to hold the above granted Land in Fee Simple, unto the said James Robinson, Robert Lawrence and Robert W Holt their Heirs and Assigns forever, subject to the taxes to be from time to time imposed by the Legislative Council equally upon all landed Property held in Fee Simple: Provided always, and this grant is made upon the express condition, that if Robinson, R. Lawrence, and R W Holt, their Heirs, Executors or Administrators shall, in all cases of dispute in relation to his or their rights, title or interest in the land hereby granted, or any part or parcel thereof, submit the same to the judicial tribunals of the Hawaiian Kingdom, and abide by the final decisions of those tribunals, without seeking the intervention of any Foreign Nation or Representative; and in case he or they shall refuse so to do, his and their estate therein and all of his and their rights, title and interest therein, shall cease and determine, and the same shall be immediately forfeited and escheat to the Hawaiian Government.

In witness whereof, I have hereunto set my Hand, and caused the Great Seal of the Hawaiian Islands to be affixed, at Honolulu, this 24th day of December 1852

Signed Kamehameha

Signed Keoni Ana

Figure 21. Royal Patent 973 to Robinson, Lawrence, and Holt.

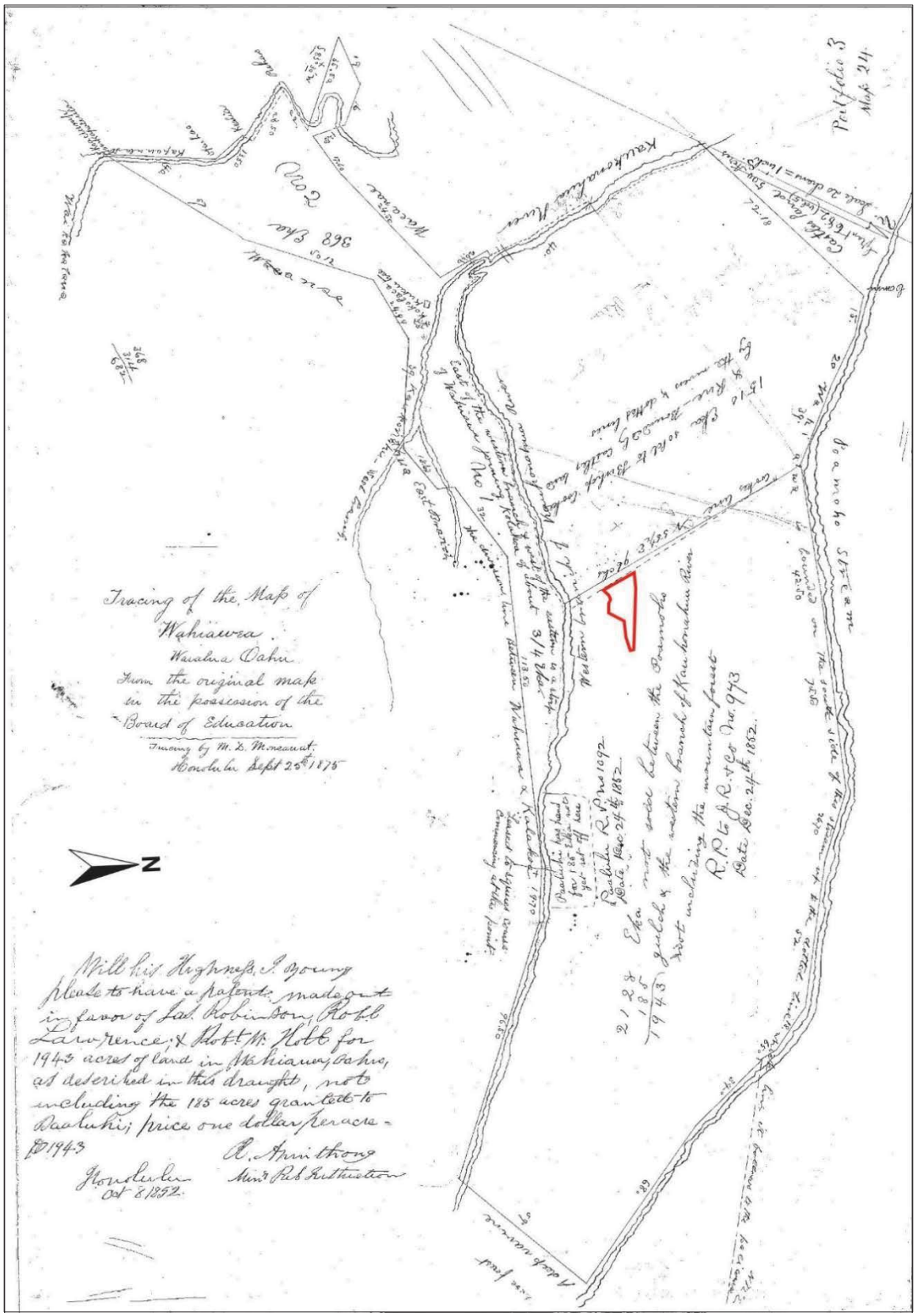


Figure 22. Hawai‘i Registered Map 80 showing Royal Patent (R.P.) Grant 973 with approximate location of study area outlined in red.

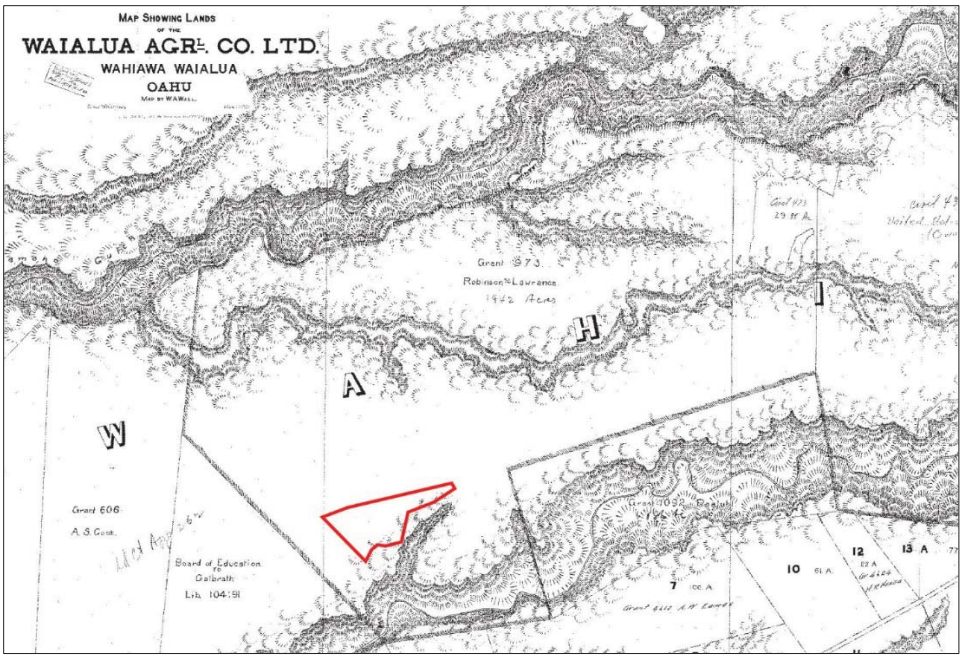


Figure 23. Portion of Hawai‘i Registered Map 2056 showing Grant 973 within Waialua Agricultural Lands and approximate location of study area outlined in red.

By 1904, the small Hawaiian Pineapple Company cannery at Wahiawā produced 8,810 cases of canned pineapple, using horse-drawn wagons to haul the product to Honolulu for sale and shipping (Brief History n.d.). The following year, the company packed 125,000 cases of pineapple (also known as “pine”). In 1907, the company constructed the Iwilei Cannery near the docks in Honolulu, and soon the Oahu Rail and Land Company built a connecting rail between Wahiawa and Honolulu, facilitating the operations of the canneries and shipments of pineapple (State of Hawai‘i Department of Agriculture n.d.) (Figure 24).



Figure 24. Oahu Rail and Land Company map, showing route from Wahiawā to canneries near Pearl Harbor. n.d. Source: http://www.ilind.net/2014/11/12/honolulus-original-railroad/

In 1908, 79.2 percent of lands under pineapple cultivation in Hawai‘i were located on the island of O‘ahu (Hawkins 2011:117). The expansion of the industry was aided by the development in 1911 of the Ginaca machine, an automated peeling and slicing device invented by Dole employee Henry Ginaca (State of Hawaii Department of Agriculture n.d.). The machine more than tripled the amount of pineapple that could be processed each minute (Brief History n.d.). Within a few years, the Hawaiian Pineapple Growers Association, which at that time was headed by James Dole, launched an ambitious national advertising campaign to promote the sales of Hawaiian pineapple. In 1911, the Hawaiian Pineapple Company began its own advertising campaign, which featured pineapple juice and the company's own label of canned pineapple (Figure 25).



Figure 25. Early 20th Century Hawaiian Pineapple Company paper can label.

During World War I, 40 percent of the Hawaiian Pineapple Company's winter pack was requisitioned by the U.S. military. As the industry expanded along with the demand for canned pineapple, land on O‘ahu became less available, and in 1922, the company bought the entire island of Lāna‘i and developed a large portion of it into the world's largest pineapple plantation.

As the pineapple cultivation and processing industries grew in Hawai‘i, shortages of laborers to work plantations and canneries became severe. The sugar industry in Hawai‘i was experiencing the same problems, and in 1919 the Hawaiian Pineapple Growers Association and the Hawaiian Sugar Planters Association agreed to share the expenses involved in bringing Filipino laborers to Hawai‘i. This resulted in Filipinos becoming the largest national group of workers in the pineapple industry (Figure 26). The policy of active recruitment of workers from the Philippines was essentially ended in 1927, when the plantations' labor needs were met (NRHP #14000970).



Figure 26. Scene on a pineapple plantation, with harvested pineapples, O‘ahu, Hawai‘i, between ca. 1910 and 1925. Source: Carpenter Collection, Library of Congress.

A comparison of the land utilization maps of 1906 and 1930 (Figure 27) reveals a striking contrast in the amount of land used for pineapple cultivation, which is significantly greater in 1930. Much of the pineapple lands were former pasture/grazing lands. The largest pineapple farming area was located in Wahiawā. In 1930, of all the islands, O’ahu had the largest percentage of land area in cultivation: 21.63 percent (ibid.:47); of which, 42.45 percent was dedicated to pineapple while 51.86 percent was planted in sugarcane and 5.69 in other crops (ibid.:53). Coulter provides the following description of some of the land areas set aside for pineapple cultivation that “were not equally suited to raising that crop” during the early 1930s:

> On the island of Oahu some of them were in scattered locations on the leeward side of the rain forest, difficult of access, where the soil was thin and pests numerous and active. They could only by a stretch of the imagination be classed as arable land. Nearly all such land has now been abandoned. Some of it will probably remain waste land. Part of it may be afforested. (1933:98)

The Depression triggered the reorganization of the Hawaiian Pineapple Company in 1932, and Dole became Chairman of the Board of the new company. By 1930, nine million cases of pineapple were packed by eight canneries in Hawai‘i. The Dole brand was introduced in 1933, and in 1937, the demand for pineapple resulted in the largest production and sales in the company’s history. The company established employee welfare and relations programs, including a credit union.

World War II created shipping difficulties, and new supply and manpower shortages. During the war, the number of regular year-round employees of the pineapple industry in Hawai‘i dropped from about 12,250 to about 7,500. Planted acreage and cannery operations continued, with labor being provided by seasonal and student labor. In 1946, the pineapple and sugar industries needed more full-time employees and again looked to the Philippines to supply labor. That year, about 6,000 Filipino workers immigrated to Hawai‘i, primarily from northern Luzon, to work in pineapple harvest and production (NRHP #14000970).

In 1955, the Hawaiian Pineapple Company initiated a program of expansion, opening a new cannery in 1957 that produced 350 million cans, and in 1960, established a land planning and development department. Stockholders approved a change of the company name to Dole Corporation, which subsequently merged with Castle & Cooke, Inc. in 1961 (Brief History n.d.).

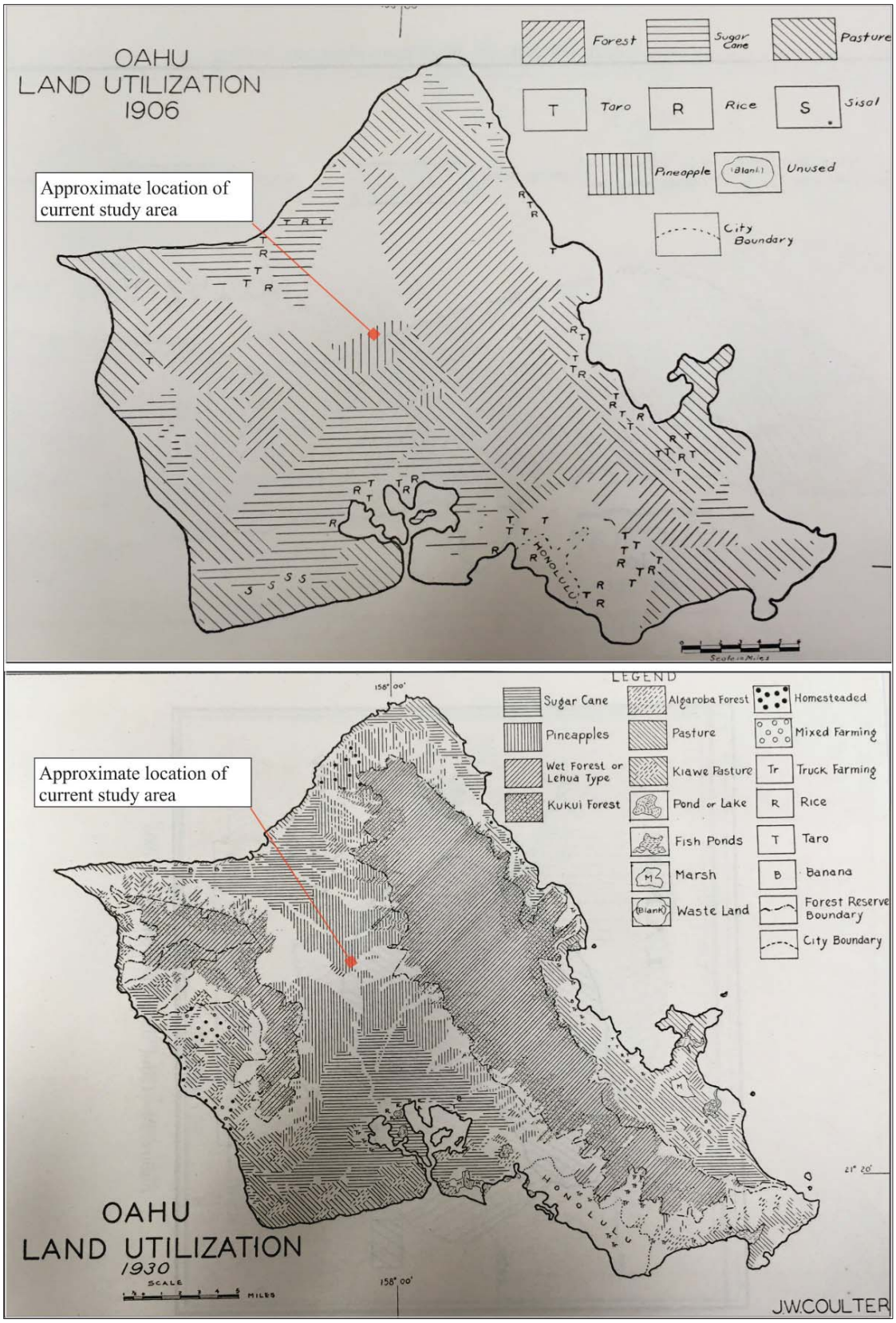


Figure 27. Land utilization maps of Oʻahu in 1906 (top) and 1930 (bottom).

On O‘ahu, most of the pineapple cultivation during the twentieth century was concentrated in the Leilehua Plateau area north and south of Wahiawā, between the Ko‘olau and Wai‘anae Mountain ranges. California Packing Co., Hawaiian Pineapple Co., Ltd., and Libby, McNeill & Libby were the major producers in the area (NRHP #14000970). Throughout the century, the importance of pineapple in Hawai‘i’s agricultural industry was second only to sugar. For the first half of the century, Hawai‘i was the world’s largest producer of pineapples. During the middle of the century, pineapple processing was Hawai‘i’s second largest industry. With plantations and canning facilities on almost every Hawaiian island, the industry was responsible for the cultivation of thousands of acres of land, the employment of thousands of workers, and the processing of millions of pineapples. In addition to the economic impact of the industry, the fruit became a powerful icon of the Territory and later State of Hawai‘i (NRHP #14000970).

Whitmore Village was named for John Lawler Whitmore (1879-1933), plantation manager of the Hawaiian Pineapple Company, who came to Hawai‘i in 1902 to work for Dole. He worked at the company’s original cannery at Wahiawā during his first year in Honolulu, then moved to the plantation department, which he managed for the next 30 years (Hawkins 2011:221). Whitmore (Figure 28) was the first to recognize the advantages of mulching plants and weed-suppression using an asphalt-impregnated paper. He began to use the method for pineapple cultivation, which resulted in as much as 50 percent higher yields. By the 1930s, the use of paper mulch for pineapple crops was widespread (Hawkins 2011:101).



Figure 28. John Lawler Whitmore in pineapple fields, ca. 1910.

Hawaiian Pineapple Company had the most extensive system of plantation camps of the three large producers on O‘ahu. In the 1940s, the company had about 15 labor camps on the Leilehua Plateau, including Waimea Camp and ‘Ōpae‘ula Camp in the north and Kipapa #1 and Robinson #1 and #2 in the south. Some of these camps were very small, in some cases consisting of only a few houses in a gulch, but others, such as Brodie Camp #2, had a number of houses laid out on streets. Beginning ca. 1950, these camps were closed and the workers re-located to Whitmore Village, along with many of the better houses. There were more than 15 villages scattered across the Dole’s pineapple plantation, and after years of usage James Dole realized a new plantation village was needed to house Dole employees. During the 1940s, Hawaiian Pineapple Company closed antiquated facilities and began to consolidate the villages into Whitmore Village in 1947 (Wahiawa Welcomes You n.d.).

By the 1950s, HPC had changed its name to Dole and had merged with Bumble Bee, formerly Columbia River Packers (CRP), into Castle & Cooke, which turned the Hawaiian business into “an important segment of the American food industry, in addition to its interests in shipping, stevedoring, and merchandising” (Taylor et al.1976:237). The formation of the subsidiary Oceanic Properties soon followed, which managed and developed Castle & Cooke’s

155,000 acres spread across the Hawaiian Islands. On Oʻahu, Castle & Cooke had land holdings that consisted of "42,000 acres (almost half in sugar and pineapple), plus property in the business, industrial, and waterfront sections of Honolulu" (ibid.). During this time, canned sliced pineapple and canned and frozen pineapple juice reached their peak, and in the 1960s, Hawaii pineapple growers supplied more than 80 percent of the world's output of canned pineapple. However, by 1966, pineapple production had begun to decline, and many of the fields formerly dedicated to pineapple production were retired. In 1983, Del Monte Corp. closed its Hawaiʻi pineapple canning operations, but by 1984 had opened a new Hawaiian pineapple juice concentrate plant in Kunia. In 1992, Dole Packaged Foods Company closed its Lānaʻi Plantation and its Iwilei Cannery.

Site-Specific History

The most recent use of the study area has been as a maintenance yard for the Dole Company; at the time of survey, many buildings appeared to be unused, and several had been leased to independent companies. The project area encompasses TMK: (1) 7-1-002:009 and portions of TMK: (1) 7-1-002-004; the current landowner of record of both parcels is Hawaiʻi State Department of Agriculture, Agribusiness Development Corporation (ADC). The State Bureau of Conveyances website shows that TMK: (1) 7-1-002-009 experienced several changes in ownership in 2013: from Castle & Cooke, Inc., to Dole Food Company, Inc., at the beginning of the year, and deeded from Castle & Cooke, Inc., to ADC at the end of the year. Although ADC currently owns TMK: (1) 7-1-002:004, previously Dole lands, no conveyances of property were shown (State of Hawaii Bureau of Conveyances 2018). The buildings located within the current study area on TMK: (1) 7-1-002:004 (previous Dole property) include the four large sheds, three administrative buildings, two storage buildings, the Recreation Community Building, and the Japanese Clubhouse; all of the other potential resources within the study area are located within TMK: (1) 7-1-002-009, which is former Castle & Cooke property.

A map (Map 001) associated with Land Court Application 1562, originally dated February 26, 1946 shows the project site within a portion of Lot B of Grant No. 973 transferred to Hawaiian Pineapple Company, Ltd., from James Robinson, Robert Lawrence, and Robert W. Holt (Figure 29). A second building is shown south of the Community Recreation Building, which might have been subsequently removed. The map also depicts the layout of several streets south of Whitmore Avenue to the east of the study area, part of the Whitmore Village residential development.

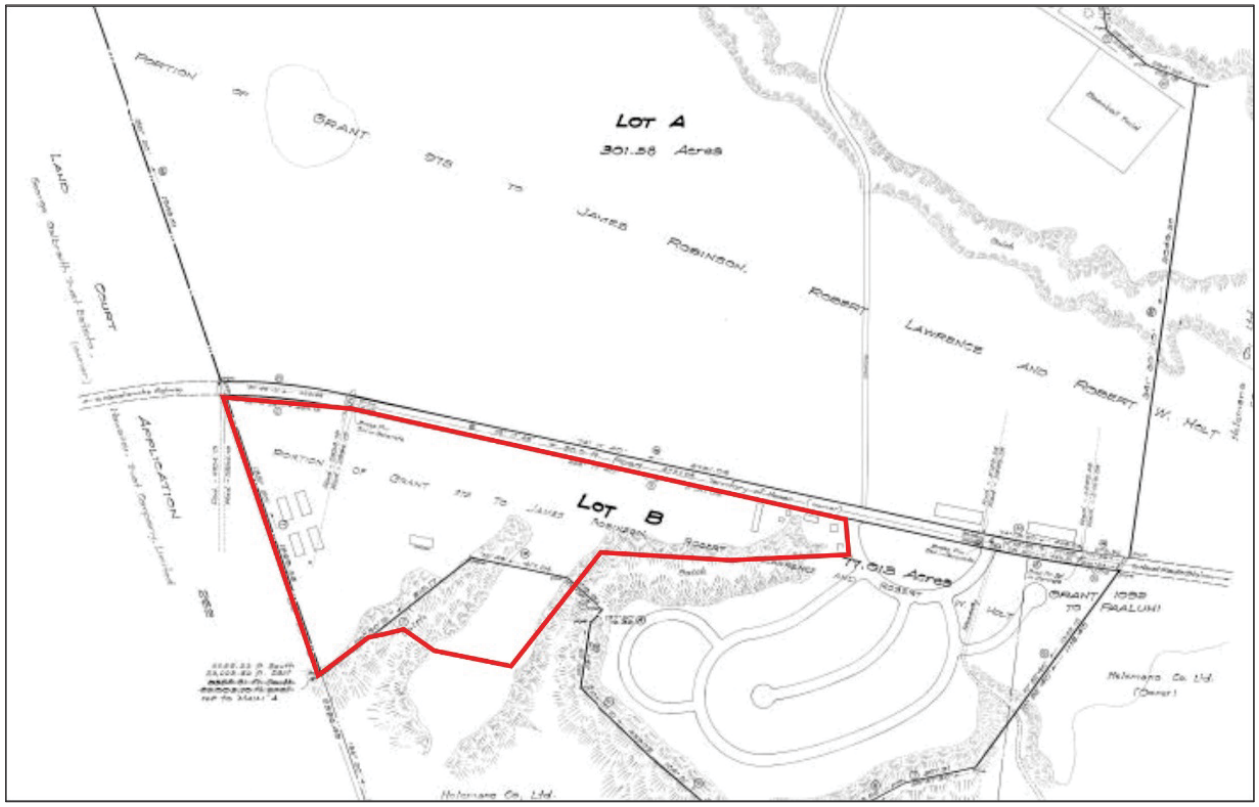


Figure 29. Land Court Application 1562 Map 001 showing study area outlined in red within Lot B.

The Sanborn Fire Insurance Company Maps index sheet for the town of Wahiawā dated 1942–1957 notes that a new sheet (Sheet 8) dated July 1957 "includes additional territory formerly unmapped." The new sheet indicates that the buildings, structures, and streets of the Whitmore Village residential development were constructed prior to 1957, and were likely constructed after 1942, when the first Sanborn maps were produced. The new sheet (Figure 30) shows Whitmore Village extending both north and south of Whitmore Avenue and includes the eastern portion of the study area. Within the study area, the map identifies a grouping of four structures labeled "Truck and Auto Garages," three buildings labeled "offices," and the community "Hall" building, all belonging to the Hawaiian Pineapple Company.

During the 1970s, Dole reduced pineapple production in Wahiawā as the canned produce became less profitable and a shift to fresh fruit production was underway (Bartholomew et al. 2012). Dole continued to grow fresh pineapple on O'ahu, "primarily for the Oahu and tourist markets. . . " and "to keep lands owned by Maui Land Pineapple Company and Dole Food Company in agriculture to take advantage of the favorable tax base such lands enjoy" (ibid.: 1397). This shift is evident in a comparison of two aerial photographs taken as part of the United States Government Survey in 1962 and 1977. The 1962 aerial shows all of the buildings and structures currently extant within the TMK: (1) 7-1-002:004 portion of the current study area: the four large parking sheds, the three office buildings to the east, the two storage sheds to the south, and the two recreation/clubhouse buildings near Nani Ihi Avenue. Within the TMK: (1) 7-1-002-009 portion of the current study area, only two of five the Quonset huts visible in the 1962 image remain today; the area is primarily covered in pineapple fields, as are all of the open areas surrounding Whitmore Village, including the current residential area west of the original housing (Figure 31). By 1977, the pineapple fields on the eastern side of the project area have been cleared, and most of the currently extant buildings and structures are present (Figure 32). A 2006 satellite image shows virtually all of the surrounding pineapple fields removed (Figure 33).

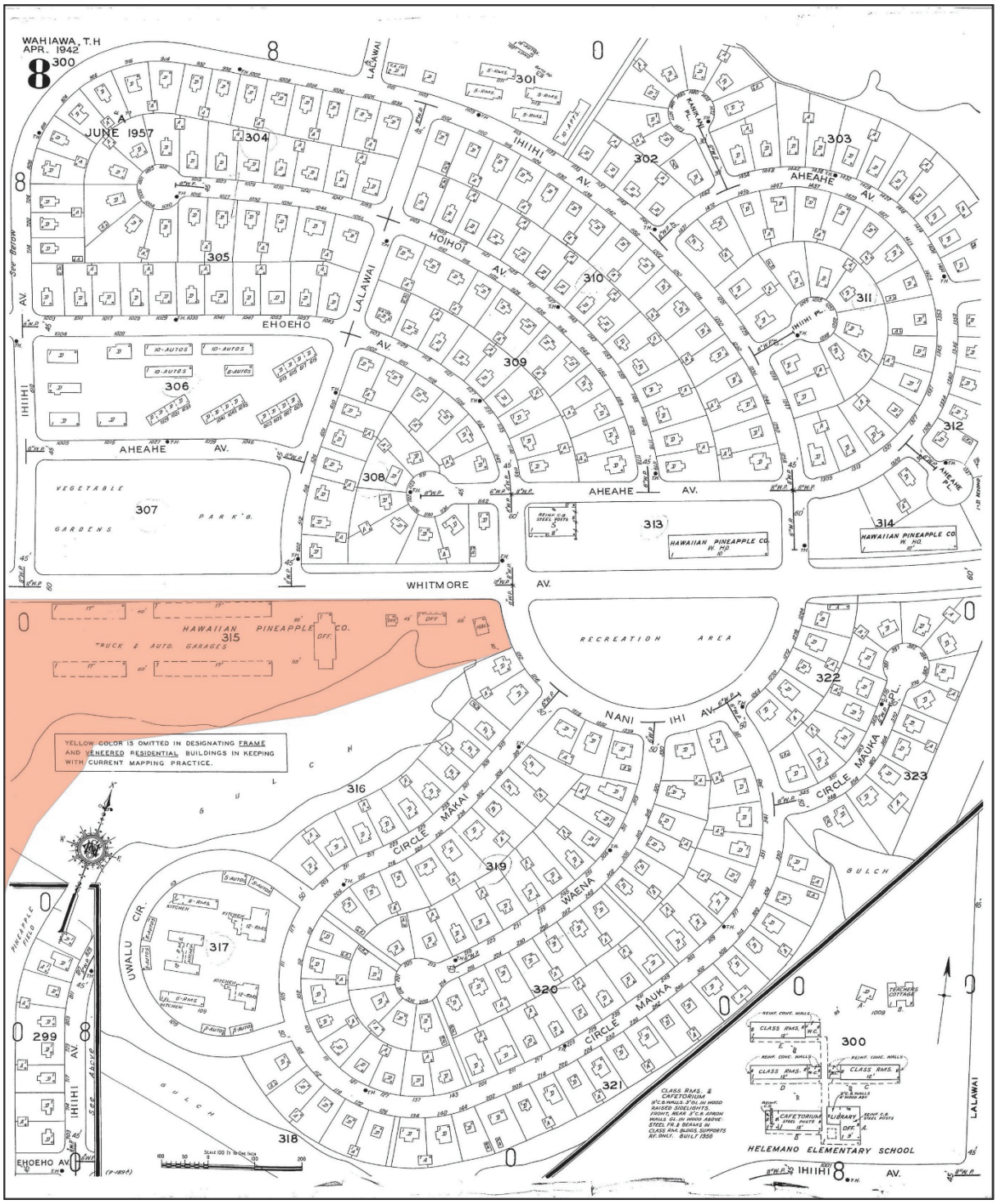


Figure 30. Sanborn Fire Insurance map of Whitmore Village dated 1942 with updates through 1957 (portion of current study area shaded red).

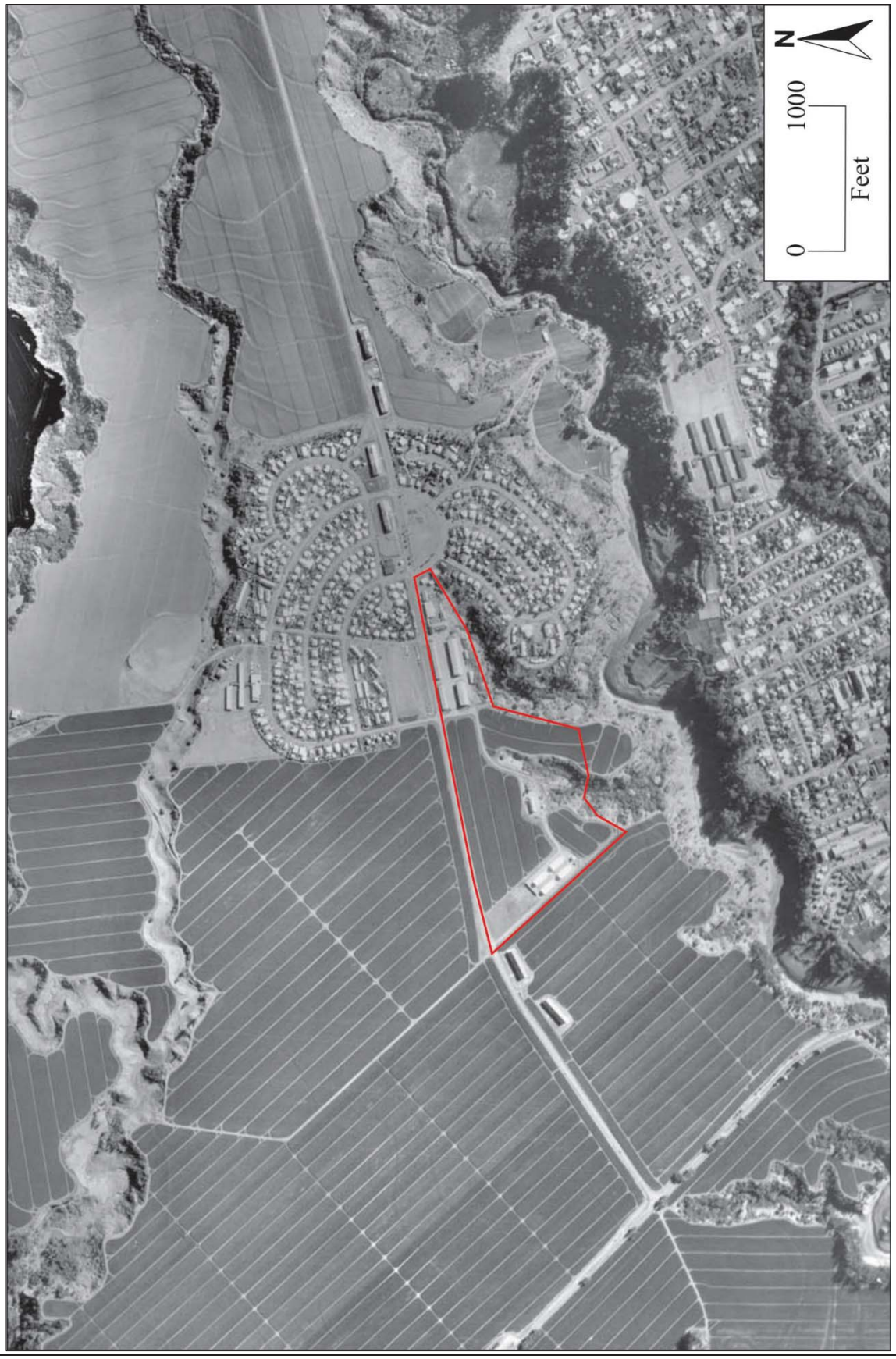


Figure 31. Aerial photograph from 1962 showing structures and active pineapple fields in the current study area (outlined in red).

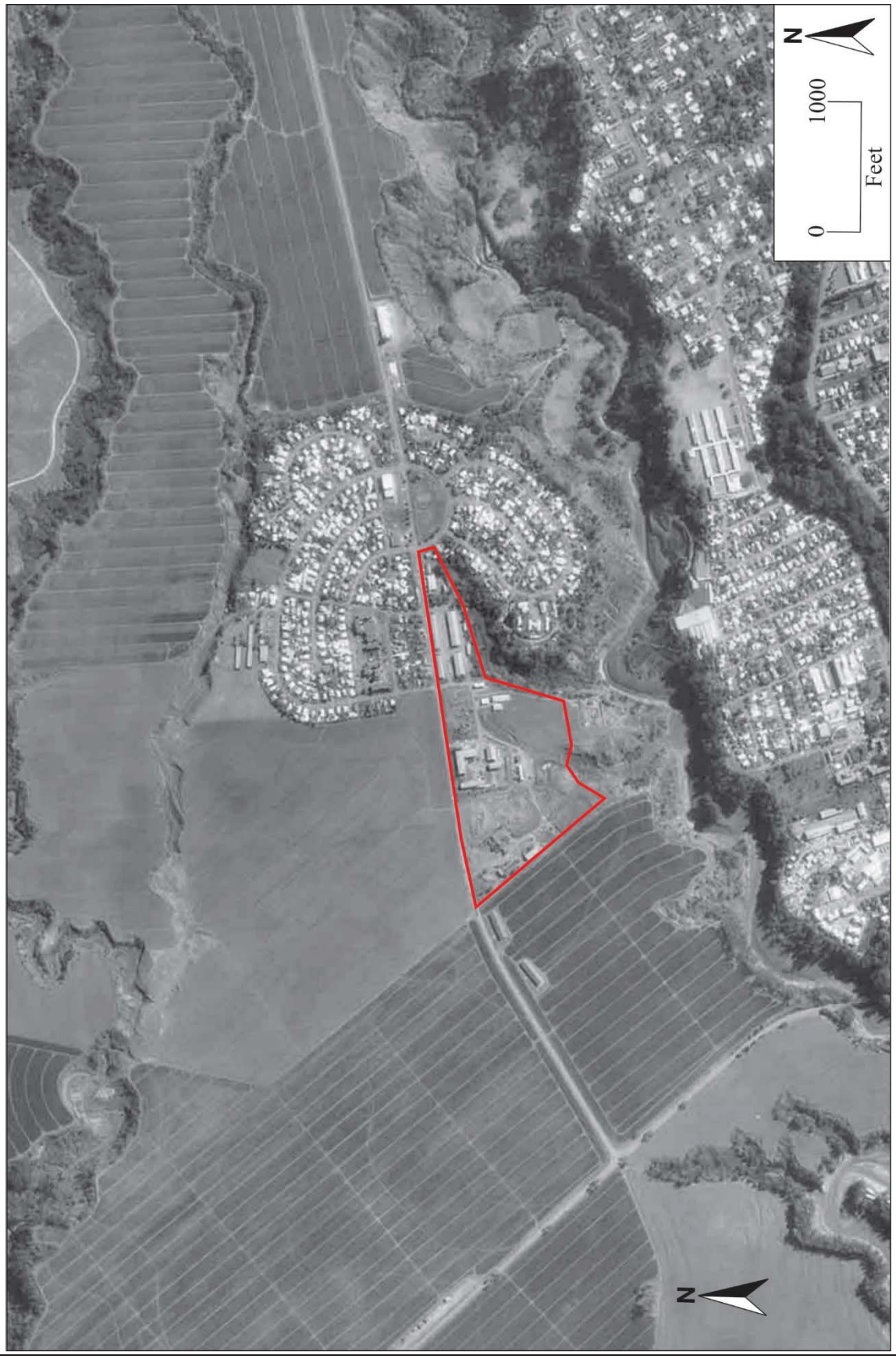


Figure 32. Aerial photograph from 1977 showing additional structures and prior removal of pineapple fields in the current study area (outlined in red).



Figure 33. 2006 satellite image showing prior removal of pineapple fields from the area surrounding the current study area (outlined in red).

PREVIOUS ARCHAEOLOGICAL STUDIES

The first formal archaeological investigations to be conducted on O‘ahu are those of J. Gilbert McAllister, who recorded and mapped nearly 400 archaeological sites during a survey of the island in 1930. McAllister’s resulting publication, *Archaeology of Oahu*, describes two sites located approximately 1 kilometer west of the current study area (see Figure 20): the Kūkaniloko birthstones (Site 218) and the associated Hoolonopahu Heiau (Site 219).

While the Hoolonopahu Heiau (SIHP Site 50-80-04-219) had been demolished by the time of McAllister’s recording, Kūkaniloko was noted as being “the only ancient site on Oahu that is being officially preserved” (McAllister 1933:135). McAllister described the site as “an enclosed area about one-half acre in size, with many large stones, some just visible, others protruding to a height of 3 to 4 feet, scattered about on a well-kept lawn” (ibid.:13). According to tradition, the site was established in the 12th Century and was known to be the birthplace of several important *ali‘i* (McAllister 1933). Kūkaniloko (SIHP Site 50-80-04-218) was listed in the National Register of Historic Places in 1973.

With the advent of Cultural Resource Management (CRM) in the 1970s, as a response to newly-established historic preservation laws and increased modern development, archaeologists began recording more discrete sites and performing test excavations throughout the state. Studies conducted in the vicinity of the current study area are presented in Table 1 and summarized below; the locations of those nearest the study area are depicted in Figure 33.

Table 1. Previous archaeological studies conducted in the vicinity of the current study area.

Year	*Author(s)*	*Type of Study*	*TMK*
1987	Saifuku, J.	Location map	(1) 7-1-001:035
1992	Henry et al.	AIS	(1) 7-1-001
1994	Colin and Hammatt	AA	(1) 7-1-009:064
1995	Nees, R.	Field survey	(1) 7-1-002
1995	Yent, M.	Site update	(1) 7-1-001:004
2000	Hammatt and Chiogioji	AA	(1) 7-1-002:004
2004	West and Donaldson	AIS	(1) 7-1-002
2005	West, E.	AIS Addendum	(1) 7-1-002
2005	West and Desilets	AIS Addendum	(1) 7-1-002
2006	Tulchin and Hammatt	AIS	(1) 7-1-002:004, 030-033
2008	Rieth, T.	Monitoring report	(1) 7-1-005:001; 7-1-002:10
2010	Stasack and Stasack	Site update	(1) 7-1-001:048
2010	Wilson and Spear	AA	(1) 7-1-001:011, 030, 031
2011	Sims et al.	Monitoring report	1-6-5-002
2015	McElroy et al.	AIS	(1) 7-1-001:002 and 005
2018	Yucha et al.	Archaeological Evaluation and Monitoring Plan	(1) 7-1-004:023 and various
2018	O’Hare et al.	Literature review and field inspection	(1) 7-1-003, 004, 005

In 1992, Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an Archaeological Inventory Survey (AIS) of Galbraith Trust Lands west of and adjacent to the current study area (see Figure 34). The study (Henry et al. 1992) identified one historic property, a stacked stone wall (50-80-04-4571), and documented additional information at the Kūkaniloko Birthstones site (50-80-04-218), originally recorded by McAllister; this represented the first detailed recording of the site. Although reportedly within their study area (see below), the Poamoho Heiau (50-80-04-01605) was not relocated in the PHRI study.

In 1994, Cultural Surveys Hawai‘i (CSH) conducted an AIS (recorded as an Archaeological Assessment) in Whitmore Village, just north of the current study area on the north side of Whitmore Avenue (see Figure 34). No historic properties were identified during the study (Colin and Hammatt 1994) and no further archaeological work was recommended.

In 1995, Richard Nees conducted a survey (Nees 1995) in multiple areas along Whitmore Avenue and Saipan Drive (see Figure 34) for the Naval Computer and Telecommunications Area Master Station (NCTAMS). That study did not identify any historic properties and no further archaeological work was recommended.

In 1995, Martha Yent of Hawaii State Parks revisited the Kūkaniloko Birthstones to further document the site following the acquisition in 1992 of a 4.5-acre buffer of land immediately surrounding the 0.5-acre historical site (Yent 1995). In that study (see Figure 34), recent improvements to the site were documented, including the installation of a parking lot and didactic signage, grading and vegetation clearing to increase access and visibility from Kamehameha Highway, and the placement of physical barriers to deter vehicular traffic from entering the site. Yent also recorded modern petroglyphs, vandalism to boulders resulting from recent campfires, and the subsequent repairs.

In 2000, CSH conducted an Archaeological Assessment of a proposed water line route between Whitmore Village and Wahiawā (see Figure 33). No historic properties were identified during the study (Hammatt and Chiogioji 2000) and no further archaeological work was recommended.

Eric West and Emily Donaldson reported negative results of a survey for the NCTAMS in 2004 (West and Donaldson 2004). West subsequently submitted two addendums to that report (West 2005, West and Desilets 2005), which focused on two new areas of proposed developments within the NCTAMS (see Figure 34); both addendums failed to identify historic properties within the project area.

In 2006, CSH (Tulchin and Hammatt 2006) performed a survey of two parcels comprising 324 acres located north and east of the current study area (see Figure 34). One historic property was identified, a historic railroad trestle (CSH-1). The authors recommended an inventory-level archaeological study be conducted to further document the railroad trestle, which to date, has not been designated with a SIHP number.

In 2008, International Archaeological Research Institute, Inc. conducted archaeological monitoring (Rieth 2008) for the construction of a road leading from Whitmore Avenue to the Naval Reservation to the north (see Figure 34). During the monitoring, heavily-disturbed soils were observed along the length of the project area corridor, the result of decades of agricultural activities including tilling and plowing (Ibid).

Petroglyph specialists Edward and Diane Stasack revisited Kūkaniloko (see Figure 34) in 2010 and made detailed maps and illustrations of the petroglyphs on the stones, as well as recording modern graffiti and taking photographs (Stasack and Stasack 2010).

In 2010, Scientific Consultant Services conducted an archaeological assessment of approximately 34 acres of former agricultural lands north of the current study area (see Figure 34). During that study (Wilson and Spear 2010), a field survey and 24 mechanically excavated test trenches did not encounter any historic properties, but demonstrated disturbed soils (up to 2.45 meters below ground surface) present throughout their project area, interpreted to be a result of agricultural tilling (ibid.).

Garcia and Associates conducted archaeological monitoring for the construction of the Helemano Trail (see Figure 34), a military vehicle access road located northwest of the current study area (Sims et al. 2011). During the monitoring, a charcoal lens (SIHP Site 50-80-04-7173) was identified and excavated; radiocarbon dates were obtained on two samples of *ʻulei* and *ʻulu*, which dated the feature, interpreted as a combustion feature, to the Precontact Period (ibid.).

In 2015, Keala Pono Archaeological Consulting conducted an AIS on a portion of TMK: (1) 7-1-001:005, located just north of the current study area, on the opposite side of Whitmore Avenue (see Figure 34). That study (McElroy et al. 2015) included a surface survey and subsurface archaeological testing in the form of eight mechanically-excavated trenches. No historic properties were identified during the project. McElroy et al. (2015) also related that in 1987, James Saifuku submitted to SHPD a map of the location of the Poamoho Heiau (SIHP Site 50-80-04-01605), drawn from his memory of the site as he observed it in the 1940s. Saifuku's map placed the *heiau* to the east of Kamehameha Highway and the "Pomoho [sic] Camp C.P.C.", approximately 1.5 kilometers northwest of the current study area (see Figure 34); a search of reports filed at the SHPD library produced his hand-drawn, unscaled map (O-778) of a rectangular "heiau site" surrounded by pineapple fields (Saifuku 1987).

In 2018, CSH conducted an Archaeological Evaluation and drafted an Archaeological Monitoring Plan for the State DOD Emergency Siren Modernization Program at 14 locations throughout Oʻahu, including one proposed siren location in Whitmore Village, approximately 150 meters east of the current study area (see Figure 34). That study (Yucha et al. 2018) included background research, a review of previous archaeological studies and a surface survey of a 100-meter radius area from the proposed siren locations. No historic properties were identified during the study and no further archaeological work was recommended.

In 2018, Cultural Surveys Hawai‘i conducted a literature review and field inspection (O’Hare et al. 2018) of areas in Wahiawā for proposed water line mains, several of which were located within 0.4 miles of the current study area. O’Hare et al. (2018) identified one possible historic property, consisting of segments of mortared cement curbing along several streets, within their project area; on-call archaeological monitoring with weekly spot-checks was recommended as mitigation.

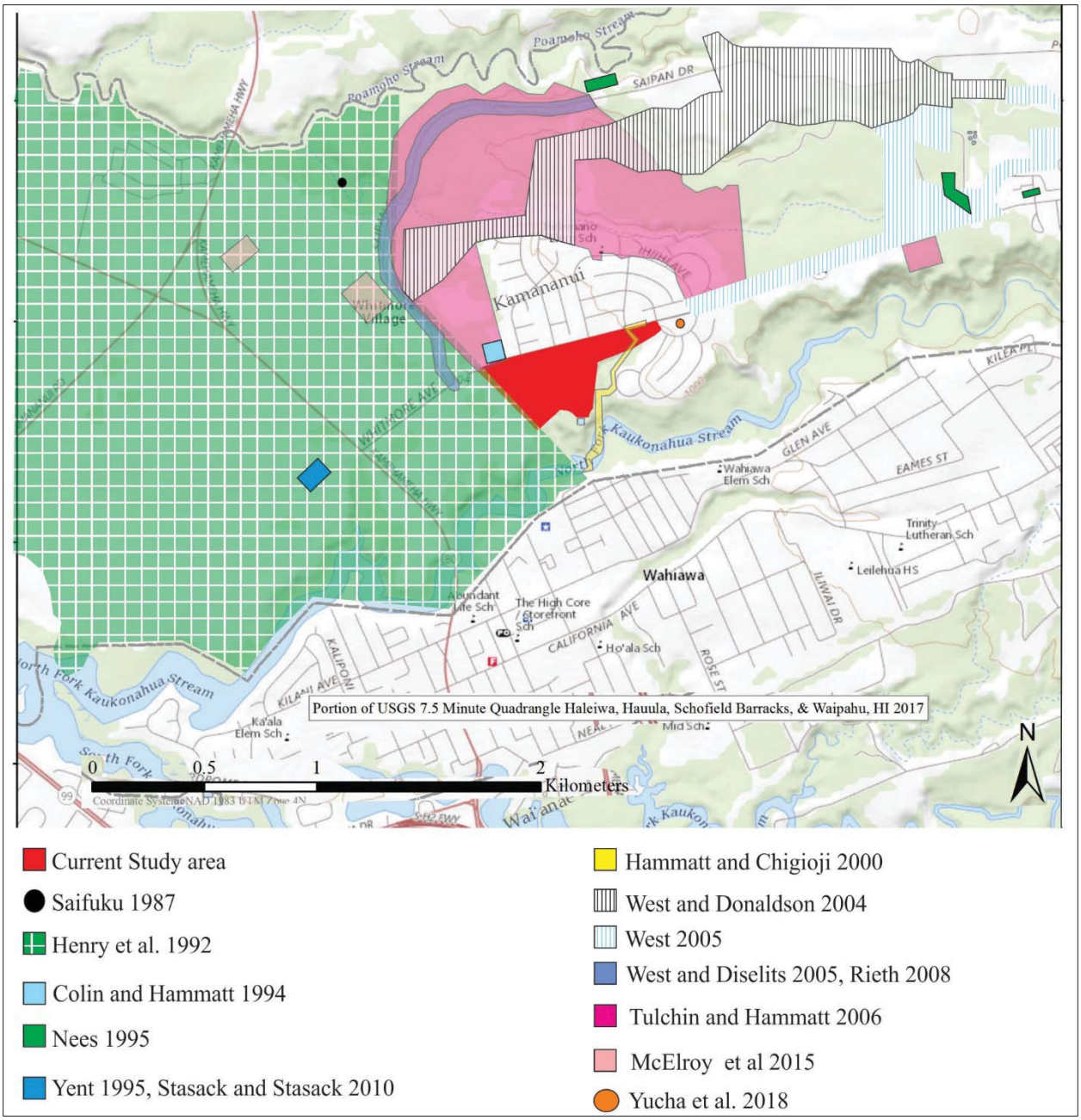


Figure 34. Previous archaeological studies in the vicinity of the current study.

3. STUDY AREA EXPECTATATIONS

While the study area vicinity was an important region in the Precontact Period, being traditionally associated with royalty and recognized as the sacred birthplace of several important chiefs, during the Historic Period, a major transformation of the land occurred. Large-scale changes to the region included the harvesting of native Sandalwood forests for export and the destruction of traditional Hawaiian lifeways and the agricultural and domestic sites they would have encompassed.

Previous archaeological studies in the vicinity of the study area have demonstrated the apparent removal of historically-significant Precontact archaeological sites such as the Poamoho (SIHP Site 50-80-04-01605) and Hoolonopahu (SIHP Site 50-80-04-219) *heiau*, as the land-use practices of the region transitioned to commercial agriculture. While one study (Sims et al. 2011) identified a Precontact charcoal lens (SIHP Site 50-80-04-7173) during archaeological monitoring, archaeological test excavations in the vicinity of the current study area have documented significant ground disturbances that have taken place throughout the former pineapple fields, which would likely have destroyed or adversely affected intact subsurface historic properties across large expanses of the surrounding land.

Based on the above information, archaeological sites on the surface would have been destroyed by extensive commercial agricultural practices. As the Hawaiian populations were heavily-reduced following the arrival of foreigners in the early 19th Century, it is likely that any structural habitation features would have been abandoned and subsequently removed as the land was repurposed for maximizing the land for larger crop yields.

Background research indicates that the study area housed buildings and structures of the former Dole Company Operations Facility at Whitmore Village. Most of these buildings and structures are utilitarian and served as machine shops, warehouses, storage, greenhouses, and other functions associated with a maintenance yard. Five buildings, located at the east end of the property, housed offices, meeting rooms, and clubhouses intended to serve the administrative, recreational, and research needs of employees and the company. It is anticipated that all of these structures will be identified on the property in varying degrees of preservation.

4. FIELDWORK

The archaeological fieldwork for the current study was conducted by Principal Investigator Robert Rechtman, Ph.D. with the assistance of Ryan Gross, M.A., and Deidra Moore, B.A. The architectural history evaluation portion was conducted by ASM architectural historians Marilyn Novell, M.S. and Shannon Davis, M.A., who meet the Secretary of the Interior's (SOI) Professional Qualifications Standards in both architectural history and history.

METHODS

During the archaeological field survey, the entire (100%) ground surface of the study area was visually inspected by field technicians walking transects, spaced no more than ten meters apart. No subsurface testing was conducted.

With respect to potential architectural resources, ASM conducted an intensive-level field survey on September 18 and 19, 2018, to document the property with photographs and extensive notes on the architectural elements, features, and materials of twenty-seven buildings and structures, as well as the setting and possible interrelationships among the functions of the property. Noted in the survey were alterations and additions, landscape elements, and the condition of the components of the buildings and structures. Additionally, ASM conducted a brief windshield survey of Whitmore Avenue and the Whitmore Village community adjacent to the Dole property to help determine the association of the study area with its surroundings.

To determine dates of original construction and any subsequent alterations of buildings and structures identified within the study area, ASM reviewed assessor's building records for the property at the City and County of Honolulu Real Property Assessment Division and permits at the Department of Planning and Permitting, historic aerial photographs, USGS maps, Sanborn Fire Insurance Maps, and narrative descriptions. Records indicate that, of the twenty-seven buildings and structures on the property, nineteen were likely constructed between 1936 and 1964 and thus meet the age requirement of 50 years for historic resources. However, because the study area encompasses only a small portion of TMK: (1) 7-1-002:004, it is difficult to be certain definitively which building is associated with any particular permits or records. Appendix A contains those records and permits available for the historic resources, as well as the corresponding Real Property Appraisal Cards, which are noted in the building descriptions below. The history of land ownership was determined through permits and through historic plat maps, tract maps, and TMK data available at the City and County of Honolulu and online at the Kipuka Database maintained by the Office of Hawaiian Affairs.

Additional research included searches for potentially significant individuals associated with the property. ASM searched Ancestry.com, U.S. Census, and online newspaper archives. To obtain a general history of the development of the Dole Pineapple Corporation facilities on Oʻahu, ASM conducted research at the Dole Corporation Archives housed at the Pacific Collection in the Hamilton Library at the University of Hawaiʻi, Mānoa, and consulted books, journals, and published as well as unpublished papers found at public libraries in both Hawaiʻi and California.

FINDINGS

As a result of the fieldwork for the current study, there were no archaeological sites encountered. Extensive modifications of the land within the study area was noted during the survey, including prior mass grading and the presence of underground utilities, building footprints, paved and unpaved roads and parking areas, and active agricultural plots. Twenty-seven buildings were identified, none of which are currently listed in either the National Register or the Hawaiʻi Register of Historic Places, and none are currently recognized by the Historic Hawaiʻi Foundation as historic properties. No previously designated local, state, or national historic districts are located within the boundaries of the property. The majority of the buildings at the former Dole Company Operations Facility at Whitmore Village are utilitarian and served as machine shops, warehouses, storage, greenhouses, and other functions associated with a maintenance yard. Five buildings, located at the east end of the property, housed offices, meeting rooms, and clubhouses intended to serve the administrative, recreational, and research needs of employees and the company. Collectively, the buildings have been assigned State Inventory of Historic Places (SIHP) Site 50-80-04-xxxx, and their locations within the study area are shown on Figure 35. Detailed descriptions of the twenty-seven individual buildings follow below.

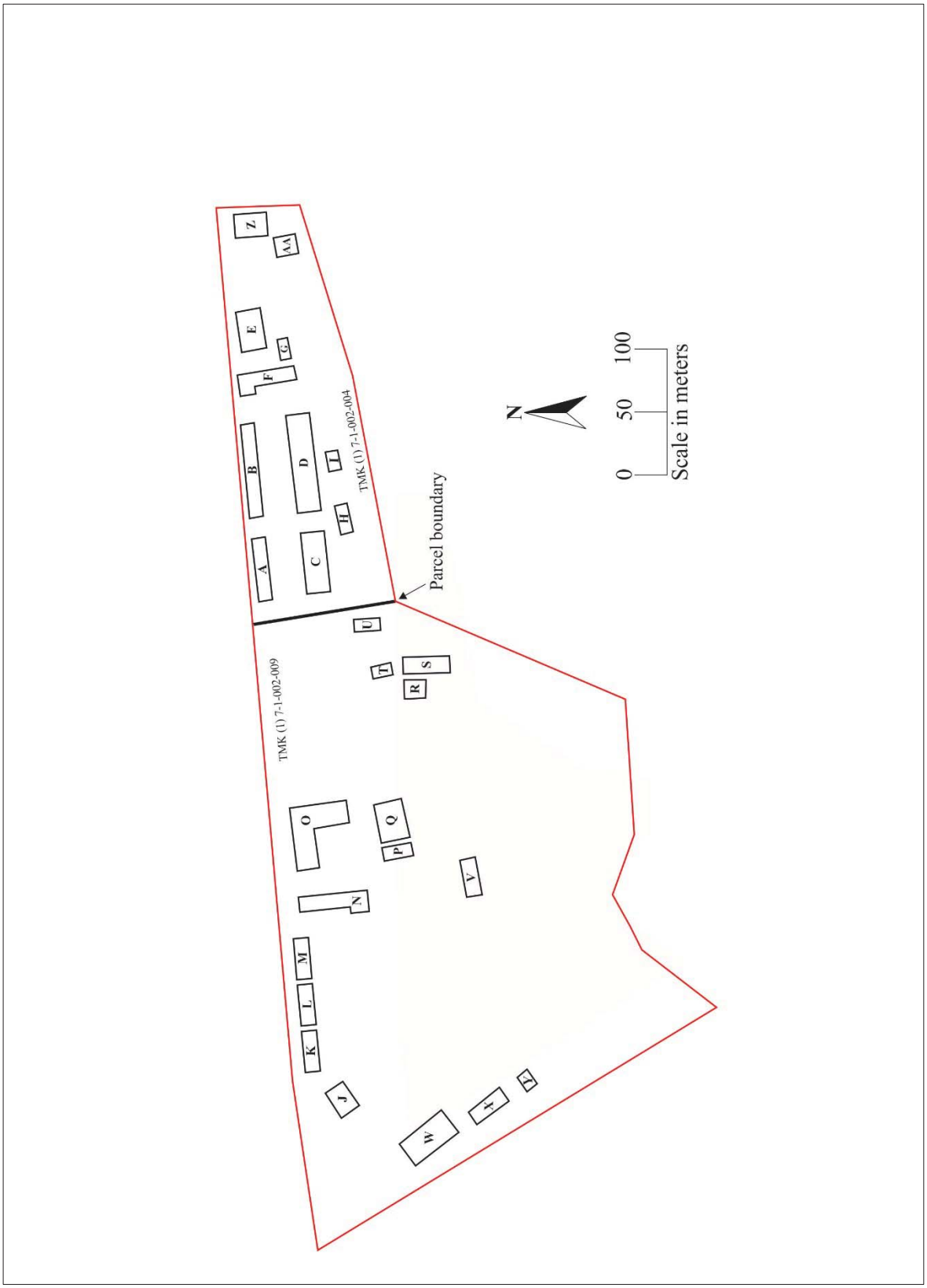


Figure 35. SIHP Site XXXX plan view showing building locations.

Building A

Building A is a 37 x 158-foot rectangular truck/equipment shed constructed in 1949. It is one of a group of four similar sheds on the east side of the study area. According to Real Property records, it is 14 feet in height with an area of 5,846 square feet (TMK: (1) 7-1-002:004, Appraisal Cards 0969 and 0970). The shed is open on its long ends, and the short (gable) ends have corrugated metal walls. It is a single-story building with no foundation that sits on asphalt paving. The shed has a side-gabled roof constructed in two stepped sections to accommodate the slight slope of the terrain toward the west. The ridgeline of the roof is off center, with the shortest part toward the south. The roof is supported by a steel-pipe truss system and covered with partially deteriorated metal sheeting (Figures 36, 37, and 38).



Figure 36. Building A showing corrugated metal end wall and off-center gabled roof, view to the northwest.



Figure 37. Building A, view to the northeast



Figure 38. Interior view of Building A showing the steel truss supports, view to the east.

Building B

Building B is a 37 x 250-foot rectangular truck/equipment shed constructed in 1948. It is one of a group of four similar sheds on the east side of the study area. According to Real Property records, it is 14 feet in height with an area of 9,250 square feet (TMK: (1) 7-1-002:004, Appraisal Cards 0953 and 0954). The shed is open its the long ends, and the short (gable) ends have corrugated metal walls. It is a single-story building with no foundation. The shed has a side-gabled roof constructed in three stepped sections to accommodate the slight slope of the terrain toward the west. The ridgeline of the roof is off center, with the shortest part toward the south. The roof is supported by a steel-pipe truss system and covered with metal sheeting (Figures 39 and 40).



Figure 39. Building B showing corrugated metal end wall and off-center gabled roof, view to the northeast.



Figure 40. Interior view of Building B showing the steel truss roof supports, view to the west.

Building C

Building C is a 63 x 158-foot rectangular truck/equipment shed constructed in 1949. It is one of a group of four similar sheds on the east side of the study area. According to Real Property records, it is 14 feet in height with an area of 9,250 square feet (TMK: (1) 7-1-002:004, Appraisal Cards 0955 and 0956). The shed is open on its long ends, and the short (gable) ends have corrugated metal walls. It is a single-story building with no foundation. The floor is composed of asphalt, concrete, and dirt. The shed has a side-gabled roof constructed in two stepped sections to accommodate the slight slope of the terrain toward the west. The ridgeline of the roof is off center, with the shortest part toward the south. The roof is supported by a steel-pipe truss system and covered with metal sheeting, which is somewhat deteriorated. Outside the structure at the west end is a wood platform approximately five feet high accessed by a short flight of steps and a large group of banana plants. Also outside the west end is a lower shed-roofed extension that serves as a work bench at the interior (Figures 41, 42, and 43). Within the shed at the west end is a corrugated metal structure approximately five feet in width accessed by two flat doors on the east and a single flat door on the north. To the west of the structure is a concrete truck-maintenance pit (Figures 44 and 45).



Figure 41. Building C, view to the northwest



Figure 42. Building C showing stepped roof sections, view to the south.



Figure 43. Building C, view to the northeast.



Figure 44. Interior view of Building C showing repair pit, view to the southwest.



Figure 45. Interior view of Building C, view to the west.

Building D

According to Real Property records, Building D is a 62 x 250-foot rectangular truck/equipment shed constructed in 1948 (TMK: (1) 7-1-002:004, Appraisal Cards 0957 and 0958). It is one of a group of four similar sheds on the east side of the study area. The shed is open on its long ends, and the short (gable) ends have corrugated metal walls. It is a single-story building with no foundation. The floor is composed of asphalt, concrete, and dirt. The shed has a side-gabled roof constructed in two stepped sections to accommodate the slight slope of the terrain toward the west. The ridgeline of the roof is off center, with the shortest part toward the south. The roof is supported by a steel-pipe truss system and covered with metal sheeting. At the east end are a small flat-roofed office beneath the shed roof and two shed-roofed extensions on the exterior (Figure 46).



Figure 46. Building D, view to the northwest.

Building E

Building E is described in Real Property records as a 101 x 50-foot administrative/office building constructed in 1960 (TMK: (1) 7-1-002:004, Appraisal Cards 0969 and 0970). It is a single-story building of steel frame construction set on a poured-concrete foundation. The roof is side-gabled with a very low slope. Described as having jalousie windows in the original assessment, the windows at the time of survey are aluminum frame, and the recessed primary entrance is glass with an aluminum frame. Exterior cladding is plaster and face bricks at the primary façade, and concrete masonry units at the south façade (Figures 47, 48, 49, 50, 51, 52, 53, 54, and 55). The interior was separated into 14 rooms at the time of the original assessment with wood and plaster board partitions, acoustical ceilings, wood doors, and four toilets and basins. The interior might have been altered since original construction. Floors are carpet and vinyl at the time of survey, and fluorescent lighting is recessed into the acoustical ceiling (Figures 56 and 57).



Figure 47. North and west façades of Building E, view to the southeast.



Figure 48. Primary façade of Building E, view to the southwest.



Figure 49. Building E (left) and Building F (right), view to the south.



Figure 50. Building E and the canopy connecting it with Building F, view to the southeast.



Figure 51. Detail of north façade of Building E, showing primary entrance and exterior wall with face bricks, view to the southeast.



Figure 52. Detail view of breezeway connecting Building F and Building E (right), view to the northeast.



Figure 53. View to the east from the lanai on Building F toward the south façade of Building E, with Building G at the right.



Figure 54. South façade of Building E, view to the north.



Figure 55. South and east façades of Building E, view to the northwest.



Figure 56. Interior view of Building E, view to the southeast.



Figure 57. Interior view of conference room of Building E, view to the east.

Building F

Building F is described in Real Property records as field offices constructed in 1944/1964 (TMK: (1) 7-1-002:004, Appraisal Cards 0971 and 0972). It is a single-story building with a foundation composed of wood posts sitting on concrete piers. The building has clearly been altered and extended several times, as indicated by its three distinct sections (Figures 58, 59, and 60). A central rectangular section with a central breezeway is flanked by an addition at the north and a second addition at the south, at least one likely added in 1962. The roof is a complex gable-on-hipped form covered in composite shingles. The north addition forms an L with the main part of the building and has an entrance at the west façade (Figures 61 and 62). An addition at the south sits on a poured-concrete foundation (Figures 63 and 64). Lanai extend the length of both the west and east façades of the main section of the building, with lower roof slopes, suggesting they might have been additions (Figures 65, 66, 67, and 68). The floors of the lanai are wood boards, and the railings are wood 2 x 4 attached to 4 x 4 posts. An office building shown on the 1942–1957 Sanborn Fire Insurance map with a smaller footprint arguably corresponds to Building F before it was altered. Records show the wood-frame building measures 24 x 26 plus 30 x 135, with lanai measuring 8 x 100 and 8 x 91. The height of the building is 10 feet. Exterior cladding is vertically scored plywood panels. The interior was not accessible at the time of survey.



Figure 58. West façade of Building F, view to the east.



Figure 59. West and south façades of Building F, view to the northeast.



Figure 60. Detail view at the primary entrance of Building F, view to the east.



Figure 61. West façade of the north wing of Building F, view to the east.



Figure 62. North façade of the north wing of Building F, view to the southwest.



Figure 63. South wing of Building F, view to the northeast.



Figure 64. South wing of Building F, view to the northwest.



Figure 65. East façade of Building F, with Building G to the left and Building E to the right, view to the west.



Figure 66. Detail of the east façade of Building F from canopy connecting it to Building G, view to the northwest.



Figure 67. Detail view of lanai at west façade, view to the south.



Figure 68. Detail of the canopy connecting Building F to Building E (left), view to the southwest.

Building G

Building G appears to be among the oldest buildings within the study area, possibly originally constructed in 1944 as part of the Dole field offices and then renovated in 1962 (see City and County of Honolulu Assessor and Real Property records in Appendix A). A building in this same location is visible on the 1962 aerial (see Figure 30). Building G is a wood-frame building with a rectangular plan and a foundation of metal beams set on concrete piers (Figures 69, 70, 71, and 72). The side-gabled roof has a moderate slope and is covered in composition shingles. Windows are screened double-hung wood with simple wood surrounds, all the same size; and the exterior cladding has the appearance of board-and-batten but is actually corrugated metal (Figure 73). The primary entrance is a double door with double screen doors with wood frames centered on the north façade. Secondary entrances are a single door to the west on the north façade and a flat metal door on the west façade. A wood walkway has been added on the west and north façades, accessed by wood steps on each façade. A corrugated fiberglass canopy shelters the walkways and the banks of windows at the east façade, and connects the building to Building F to the west. The interior consists of two main rooms: a meeting hall with a cathedral ceiling to the west and a large kitchen with an approximately 10-foot ceiling to the east (Figure 74). A large lanai is accessed through a newer aluminum sliding door from the kitchen (Figure 75).



Figure 69. Primary (north) façade of Building G, view to the south.



Figure 70. West façade of Building G showing secondary entrance to meeting hall, view to the east.



Figure 71. West and south façades of Building G, with lanai to the right, view to the northeast.



Figure 72. Detail of concrete-and-steel footings of Building G, view to the northeast.



Figure 73. Detail of the east façade of Building G, showing bank of windows sheltered by fiberglass canopy, view to the northwest.



Figure 74. Interior view of the kitchen of Building G, view to the southeast.



Figure 75. View of lanai at south façade of Building G, view to the southeast.

Building H

Building H is a single-story storage building with a rectangular plan and no foundation. The exact year of construction is unknown, however is not shown on the Sanborn Fire Insurance map (see Figure 30) that had been updated through 1957, but it is visible on the 1962 aerial (see Figure 30). The building is constructed of steel pipe trusses with wood purlins. The side-gabled roof has a very low slope and is covered in corrugated metal. At the north façade are three barn-type doors. The exterior walls are constructed of corrugated metal. The interior has several corrugated metal partitions and a dirt floor. To the southeast an open portion with wire netting that appears to have served as a lanai. Lighting is suspended fluorescent tubes (Figures 76, 77, 78, 79 and 80). The materials of Building H are deteriorated, and the building is unused.



Figure 76. Building H, view to the south.



Figure 77. Building H, view to the southwest.



Figure 78. Building H, view to the southeast.



Figure 79. Interior view of Building H showing dirt floor and fluorescent lighting, view to the southwest.



Figure 80. Interior view of Building H lanai, view to the southwest.

Building I

Building I is a single-story storage building with a rectangular plan and no foundation. The exact year of construction is unknown, however is not shown on the Sanborn Fire Insurance map (see Figure 30) that had been updated through 1957, but it is visible on the 1962 aerial (see Figure 30). The building is nearly obscured by vegetation. The side-gabled roof has a low slope and is covered in corrugated metal. At the north façade is a barn-type door with a track that extends across half the façade and a double metal door with vents. The exterior walls are constructed of corrugated metal. (Figures 81, 82, and 83). The interior has corrugated metal partitions and a dirt floor. The materials of Building H are extremely deteriorated, and the building is unused.



Figure 81. Buildings I and H, view to the west.



Figure 82. Building I, view to the southeast.



Figure 83. Detail of Building I, view to the southwest.

Building J

Building J is a metal-framed warehouse with a rectangular plan set on a poured-concrete foundation. It appears to be newer than the other buildings within the study area and possibly is the building described in Real Property Appraisal Cards 0980 and 0981. Castle & Cooke records describe a new warehouse constructed in 1984 used for Nursery Equipment Storage that measures 4,800 square feet. Real Property records describe a 60 x 75-foot warehouse with a gable roof covered in metal that was finish with construction in 1985. The side-gabled roof has a very low slope. The exterior walls are constructed of classic ribbed metal. At the primary (southeast) façade is a large two-part barn-type door, also constructed of ribbed metal. Also at that façade is a personnel door with a small canopy. The interior is a single open space with skylights and hanging pedestal-type lighting (Figures 84, 85, 86, 87, and 88). The building is in good condition.



Figure 84. Building J, view to the northeast.



Figure 85. Building J, view to the north.



Figure 86. Detail of southeast façade of Building J, view to the northwest.



Figure 87. Building J, view to the south.

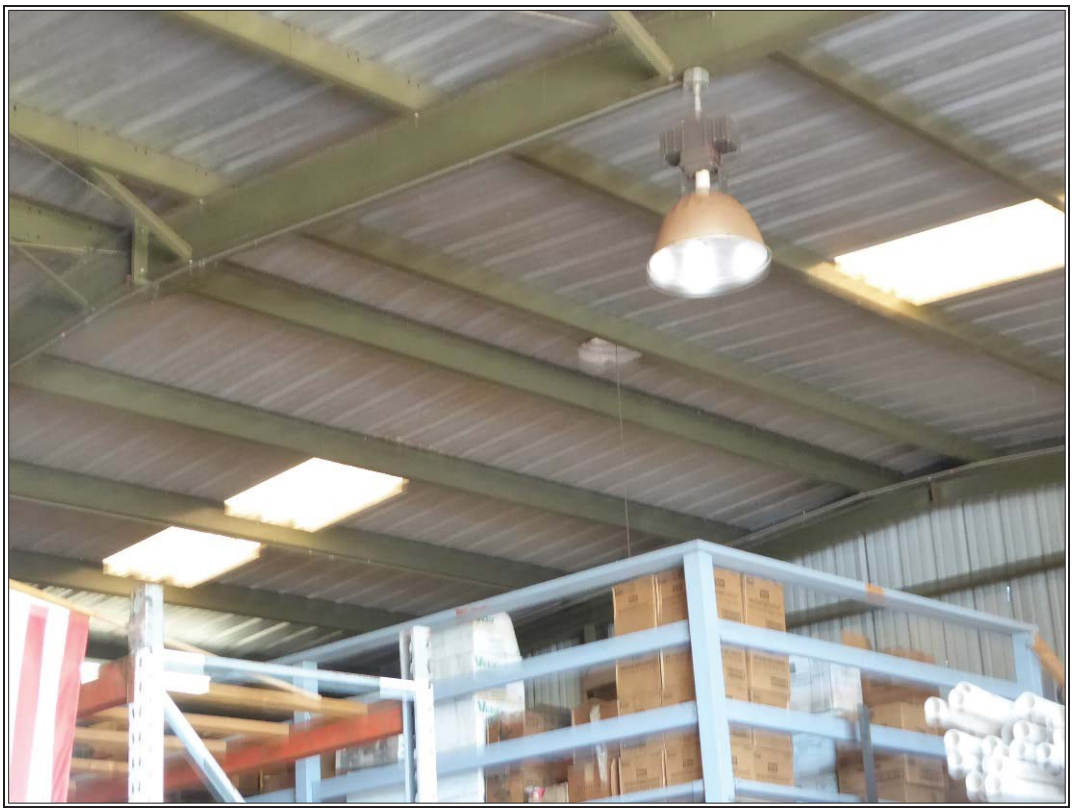


Figure 88. Interior view of Building J.

Buildings K, L, and M

Buildings K, L, and M are plant shade structures (greenhouses). Castle & Cooke and Dole records show a construction date of 1992 (John Child 2013:ex.II-N). Cover materials appear to be newer and in good condition. The three buildings are nearly identical in size and materials. They are constructed of steel pipe walls and arched roof covered in netting and plastic sheeting. The greenhouses are currently in use (Figures 89, 90, 91, and 92).



Figure 89. West façade of greenhouse Building K, view to the east.



Figure 90. Interior view of Building K, view to the west.



Figure 91. Interior view of Building L, view to the west.



Figure 92. Buildings M, L, and K, view to the northwest.

Building N

Building N is a steel-framed warehouse with an L-shaped plan set on a poured-concrete foundation constructed in 1964. It is shown in Real Property Appraisal Cards 0959 and 0960 as measuring 180 x 32 feet with an L extending 16 additional feet on the short end. Castel & Cooke records call it a "Time Machine/Stock Shop" and Dole records refer to it as a Utility Shop 9,000 square feet in size (John Child 2013:ex.II-N). It has a moderately pitched gabled roof covered in ribbed metal and has a wide overhang at the east façade. Five cylindrical ventilators sit on the ridgeline. The exterior walls are constructed of ribbed metal. Fenestration consists of a single flat door and a bank of steel windows at the north façade; eight vehicle bays, two flat doors, and a single narrow awning-type steel window at the east façade; a vehicle bay and a bank of steel windows at the south façade, and six banks of steel windows at the west façade. The small shed-roofed wing forming the L has a flat single door at the south façade and a bank of four steel windows at the west façade. The steel windows are arranged in three by seven configurations, in a combination of fixed and awning-style operable windows. Two vertical elements appearing to be painted fiberglass are positioned over each bank of windows, except those on the shed-roofed wing. A flat sign with the Dole logo is attached to the upper northwest corner of the west façade (Figures 93, 94, 95, 96, 97, 98, and 99).



Figure 93. Building N, view to the south.



Figure 94. Building N, view to the southeast.



Figure 95. Detail of west façade of Building N, view to the southeast.



Figure 96. West façade of Building N, view to the east.



Figure 97. Building N, view to the northeast.



Figure 98. Building N, view to the northeast.



Figure 99. Building N, view to the southwest.

Building O

Building O is a warehouse constructed in 1964. It has an L-shaped plan set on a poured-concrete foundation and a steel frame including heavy vertical I-beams. It is shown on Real Property Appraisal Cards 0963 and 0964 with one wing measuring 150 x 50 feet and the second wing measuring 170 x 50 feet, for a total of 13,500 square feet. Castle & Cooke records refer to the building as facilities Q and S (Dole Fabrication Shop or Vehicle Repair Shop and Office); Dole records the building as an Automotive/Welding warehouse measuring 15,125 square feet in size (John Child 2013:ex.II-N). The building is 20 feet in height. At the point where the two wings meet is an office section, labeled on assessor's records as "Engineer Office." The interior of the office was not available at the time of survey, but assessor's records mention a ceiling of acoustical tile, four offices with plaster board partitions, four toilets, six basins, and a shower stall. The cross-gabled roof is very slightly sloped. Fenestration resembles that for Building N, with banks of steel-framed windows, operable as well as awning-type. Two corrugated fiberglass panels are positioned above each bank of windows, as with Building N. Exterior walls are constructed of ribbed metal. The walls facing the inside of the L-shape are open and are sheltered by a wide cantilevered roof. Fenestration consists of seven banks of steel windows on each exterior wall, jalousie windows on the office portion of the building, a louvered vent at the west façade, and double flat metal doors at the south façade (Figures 100, 101, 102, 103, 104, 105, 106 and 107). The building is in fair condition.



Figure 100. South wing of Building O, long view to the west.



Figure 101. Open west and south wings of Building O, view to the north.



Figure 102. South wing of Building O, view to the northwest.



Figure 103. West wing of Building O, view to the southeast.



Figure 104. Detail of the south wing of Building O showing typical bank of windows, view to the west.



Figure 105. Interior view of the west wing of Building O, view to the north.

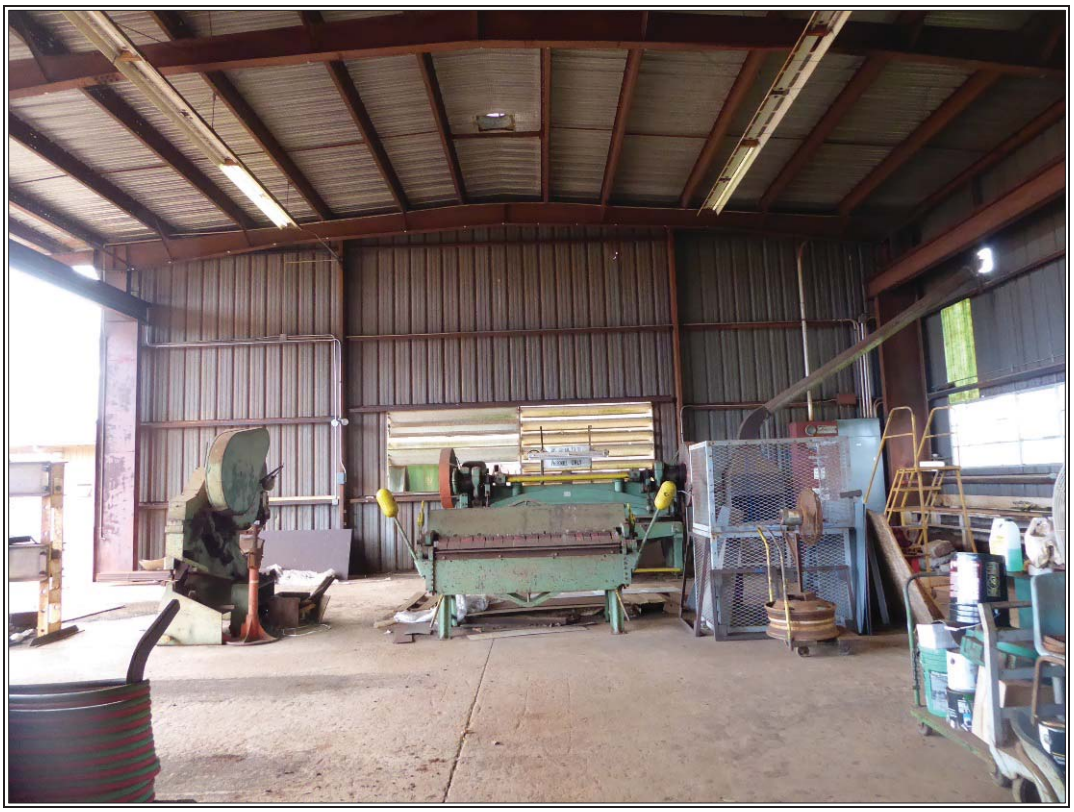


Figure 106. Interior view of Building O, view to the west.



Figure 107. West and south wings of Building O from Whitmore Avenue, long view to the southwest.

Building P

Building P is a light-manufacturing facility constructed in 1964. Castle & Cooke records describe it as the Old Tire Shop, and Dole records refer to it as a Harvesting Shop 2,625 square feet in size (John Child 2013:ex.II-N). Building P is a high steel-frame building with a narrow rectangular plan that sits on a poured-concrete foundation. It has a side-gabled roof covered in corrugated metal with a small overhang and an extension along the west façade. The walls are constructed of ribbed metal. The building is open on the west façade, and partially open on the north façade. A ribbed metal partition separates the space from east to west. Four banks of steel-frame windows at the east façade with a panel of translucent corrugated fiberglass are identical to those in Buildings O and N. Two rectangular louvered openings and a small shed roof over a metal partition at the south façade provide access to a small room within the building. A wood mezzanine is within the main part of the building toward the north. At the time of survey, Building P functioned as a welding workshop. The building is in fair to poor condition (Figures 108, 109, 110, 111, and 112).



Figure 108. East façade of Building P showing windows, view to the southwest.



Figure 109. Building P showing open shop area, view to the southeast.



Figure 110. Building P, view to the northeast.



Figure 111. South and east façades of Building P, view to the northwest.



Figure 112. Interior view of Building P, view to the northeast.

Building Q

Building Q is a steel-framed warehouse with a rectangular plan constructed in 1964. Castle & Cooke records describe it as Equipment Storage, and Dole records refer to it as a storeroom (John Child 2013:ex. II-N). It has a poured-concrete foundation and a side-gabled roof covered in corrugated metal with a small overhang on three sides and a wide overhang at the north façade. Four cylindrical ventilators sit on the ridgeline. The walls are constructed of ribbed metal. Steel-frame windows with a panel of translucent corrugated fiberglass are similar to those in Buildings N, O, and P. Fenestration consists of two vehicle bays with double metal doors at the north façade, identical to those at the east façade of Building N. Also on the north façade is a steel-frame window with a combination of fixed and awning-style panes and a panel of translucent corrugated fiberglass above; two of these window configurations are located at the west façade, and two are located at the south façade. At the east façade are two banks of five jalousie windows, two steel-frame windows, and a flat metal door. The interior was not accessible at the time of survey. The building appears to be in fair to poor condition (Figures 113, 114, and 115).



Figure 113. Building Q, view to the southeast.



Figure 114. Building Q, view to the north.



Figure 115. Building Q, view to the west.

Building R

Building R is a steel-frame greenhouse with a rectangular plan constructed in 1972/73. Castle & Cooke records describe it as "Small Nursery Greenhouse, and Dole records refer to it as "UH Greenhouse." (John Child 2013:ex.II-N). It has a side-gabled roof covered in corrugated fiberglass, corrugated fiberglass walls, and a dirt floor. Real Property Appraisal Cards 0977 and 0978 describe the building as measuring 61 x 42 feet. The primary entrance is a two-part barn-type door, each with two by two lights and a recessed panel, located at the east façade. A secondary entrance is also located at the east façade. A track allows the entrance to be fully opened by moving the doors either to the left or two the right, where the track extends beyond the mass of the building. Two square ventilation or HVAC units are attached to the exterior of the west façade, along with two square louvered openings. Two cubicle fans are suspended from the steel truss at the opposite end of the greenhouse. With most materials intact, the greenhouse is in fair condition and is currently unused (Figures 116, 117, 118, 119, 120, and 121).



Figure 116. Primary entrance on the east façade of Building R, view to the southwest.



Figure 117. South and east façades of Building R, view to the northwest.



Figure 118. Detail of Building R, showing vents on the south façade, view to the northwest.



Figure 119. Interior view of Building R, view to the southwest.



Figure 120. Interior view of Building R showing suspended fans, view to the north.



Figure 121. Interior view of Building R showing primary entrance, view to the northeast.

Building S

Building S is a 6,250-square-foot steel-frame greenhouse with a rectangular plan constructed in 1972/73. Castle & Cooke records describe it as a "Large Nursery Greenhouse," and Dole records refer to it as Dole R&D office (John Child 2013:ex.II-N). It has corrugated fiberglass walls and a dirt floor partially covered in plastic sheeting. Roofing material is missing, although the steel frame is consistent with a side-gabled roof. Real Property Appraisal Cards 0975 and 0976 describe the building as measuring 120 x 42 feet. The primary entrance is an opening located at the east façade, which appears to have been a barn-type door. A track extends beyond the mass of the building to the north. A secondary entrance is located at the west façade. At the south façade three square ventilation or HVAC units extend beyond the wall of the building. At the north façade materials are missing from a horizontal portion of the wall. Despite its poor condition, the greenhouse is currently in use (Figures 122, 123, 124, 125, and 126).



Figure 122. Primary entrance of Building S, view to the southwest.



Figure 123. West and south façades of Building S, view to the northeast.



Figure 124. Interior view of Building S, view to the south.



Figure 125. Interior view of Building S, view to the southwest.



Figure 126. Interior view of north wall of Building S, view to the north.

Building T

Building T is a rectangular warehouse set on a poured-concrete foundation constructed in 1964. Castle & Cooke records describe it as "Sweet Aloha Farms Farm Equipment/Storage, and Dole records call it a "UH Warehouse, Boiler Room, Office" 1,500 square feet in size (John Child 2013:ex.II-N). It has a flat roof with no overhang on three sides and a wide cantilevered overhang at the west façade. Fenestration consists of two ribbed metal barn-type doors on tracks—one on the north façade and one on the west façade. Also on the west façade is an open space that appears to serve as a garage or workshop and a single flat metal door. There is no fenestration on the south façade. The interior was not accessible at the time of survey. The building appears to be in fair condition (Figures 127, 128, 129, and 130).



Figure 127. Building T with temporary metal shed in front, view to the southwest.



Figure 128. Building T with temporary metal shed in foreground, view to the south.

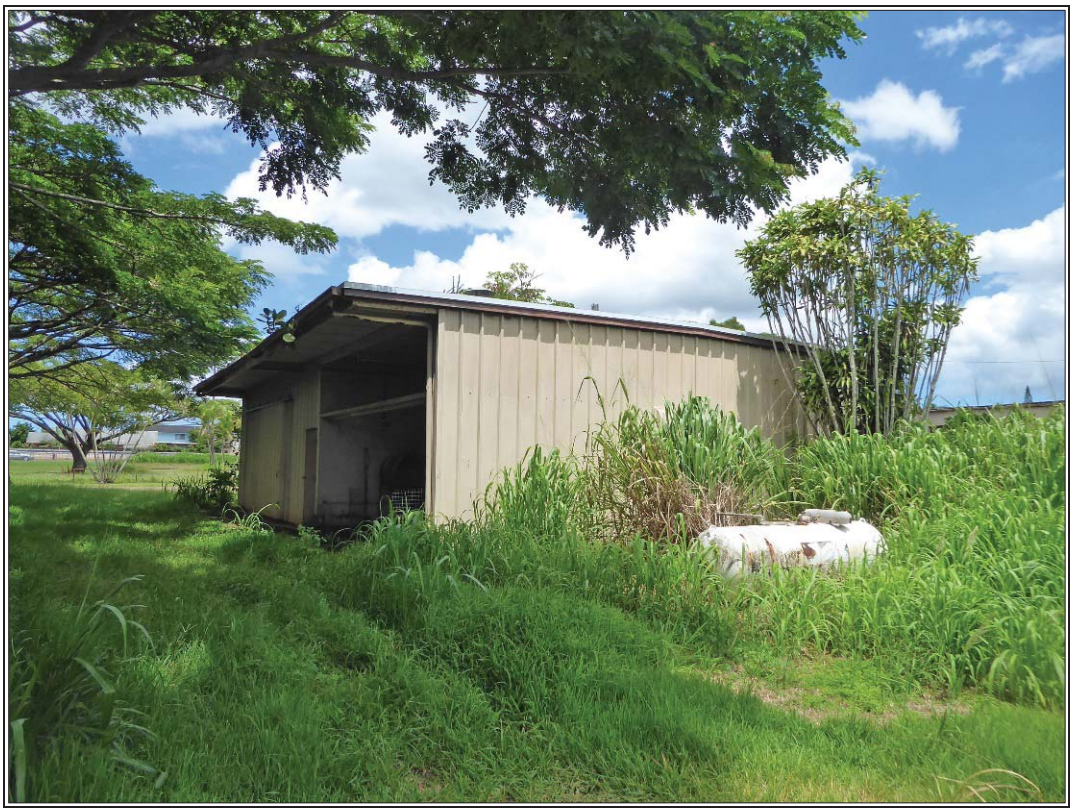


Figure 129. Building T showing roof overhang at west façade, view to the northeast.



Figure 130. Building T, view to the southeast.

Building U

Building U is a rectangular warehouse set on a poured-concrete foundation constructed in 1964. Castle & Cooke records report it as a 2,400-square-foot Research Hawaii Office/Equipment Storage, and Dole records call it an R&D Office (John Child 2013:ex. II-N). It has a very slightly sloped side-gabled roof with a narrow overhang constructed of corrugated metal. The walls are constructed of ribbed metal. Fenestration consists of at least one window at the north façade; three windows at the east façade; a single flat metal door at the south façade; and three corrugated metal roll-up doors, two windows, and a single flat door at the west façade. Most of the windows are obscured behind wood lattice. The interior was not accessible at the time of survey. The building appears to be in poor condition (Figures 131, 132, 133, 134, and 135).



Figure 131. East and north façades of Building U, view to the southwest.



Figure 132. Building U, view to the south.



Figure 133. South and east façades of Building U, view to the northwest.



Figure 134. Building U showing three roll-up doors at the west façade, view to the northeast.



Figure 135. Building U, view to the west.

Building V

Building V is a Quonset hut with a roof formed by corrugated metal bent over a curved frame and two flat façades at the ends. Constructed in 1949, Castle & Cooke records describe it as "Aaron O'Brien Equipment Storage, 4,725 square feet in size (John Child 2013:ex.II-N). Quonset huts were developed for military use and commonly re-purposed as housing, warehouses, and industrial and commercial space after World War II. Building V has a central hinged double door at each end, in addition to a third hinged door and a small window at the north façade. The condition of the materials is poor. The interior was not accessible at the time of survey (Figures 136, 137, 138, 139, and 140).



Figure 136. West façade of Building V, view to the east.



Figure 137. Building V, view to the northeast.



Figure 138. Building V, view to the northwest.



Figure 139. East façade of Building V, view to the west.



Figure 140. Building V, view to the southwest.

Building W

Building W is a single-story steel-framed warehouse (pellet storage Butler building per Real Property records) with an irregular plan set on a poured-concrete foundation constructed in 1963. Castle & Cooke records describe it as "Trash Man-Heavy Equipment Repair, and Dole records refer to it as a Warehouse, 12,600 square feet in size (John Child 2013:ex.II-N). It appears to be the building described in Real Property Appraisal Cards 0973 and 0974 as measuring 72 x 142 feet and 26 feet in height. The main part of the building is rectangular in plan and has a moderately pitched gabled roof covered in ribbed metal with panels of translucent corrugated fiberglass. A wing and an open area on the northeast façade have a shed roof that connects to the larger gabled roof. The exterior walls are constructed of ribbed metal. Fenestration consists of two large ribbed-metal barn-type doors at the south corner, one on the southwest façade and a second on the southeast façade. At the northwest façade is a double set of hinged ribbed-metal doors that appear to have been converted from a barn-type sliding door. The shed-roofed wing has several small windows on the southeast and northeast façades and a single flat door opening on to the open shed area. The building appears to be in poor condition (Figures 141, 142, 143, 144, 145, 146, and 147).



Figure 141. Primary entrance of Building W, view to the north.



Figure 142. Northwest façade of Building W, view to the southeast.



Figure 143. Open shed portion of Building W, view to the south.



Figure 144. Detail of the open shed portion at northeast side of Building W, view to the southeast.



Figure 145. Building W, view to the southwest.



Figure 146. Southeast and northeast façades of Building W, view to the west.



Figure 147. Southwest façade of Building W, view to the east.

Building X

Building X is a typical Quonset hut constructed ca. 1941 with a roof formed by corrugated metal bent over a curved frame and two flat façades at the northwest and southeast ends. Castle & Cooke records describe it as Nursery Equipment Storage, 4,000 square feet in size (John Child 2013:ex.II-N). Building X has a central hinged corrugated metal double door at each end. The condition of the materials is poor (Figures 148, 149, 150, and 151).



Figure 148. Building X, view to the northwest.



Figure 149. Building X, view to the west.



Figure 150. Building X, view to the north.



Figure 151. Building X, view to the south.

Building Y

Building Y is a wood-frame shelter with a moderately sloped gable roof. The roof is covered in corrugated metal and has wide wood fascia. The roof sits on a poured-concrete partial wall. Two poured-concrete elements occupy the space within the structure. The concrete elements are blocks with curved centers, apparently to hold large tanks. Castle & Cooke, Inc., indicates the structure was a shelter for soil fumigant tanks and constructed in 1985 (John Child 2013:Ex. II-M) (Figures 152, 153, and 154).



Figure 152. Building Y, view to the north.



Figure 153. Detail of southwest façade of Building Y, view to the northeast.



Figure 154. Interior view of Building Y, showing supports for soil fumigant tanks, view to the west.

Building Z

Building Z is a single-story wood-frame building with a moderately sloped gable roof and board-and-batten interior/exterior walls. The roof is covered in corrugated metal and the foundation/floor is poured concrete. Real Property Appraisal Cards 0941 and 0942 describe the building as a "Community Recreation Building" measuring 28 x 35 feet, constructed in 1936. An enclosed kitchen is built into the south-central portion of the building via three interior walls, containing modern commercial restaurant equipment including a stainless steel stove hood and a three compartment sink. An enclosed toilet and basin are inset into a small bathroom in the southeast corner of the building and are accessed from a single exterior door. The primary entrance to Building Z is a double steel door centered on the north façade, beneath an awning that appears to be part of the original construction; one wood framed screen door is present on the main entrance. Additional access is through a single door on the west end of the south façade and a screened single door on the southern end of the east façade, just north of the bathroom access door. The concrete foundation slab extends to the east along the building in the area of the two doors on the east façade and also extends out the full length of the east façade. Six windows are present on the west, north and east façades, which are screened double-hung wood with simple wood surrounds, all the same size. Two smaller windows on the west and south façades may represent later additions, along with an awning along the length of the northern portion of the west façade. The building is in fair condition (Figures 155, 156, and 157).



Figure 155. Building Z, north façade, view to the south.



Figure 156. Building Z, west façade, showing overhang addition, view to the south.



Figure 157. Interior of Building Z showing kitchen, view to the south.

Building AA

Building AA is a single story wood framed residence constructed in 1949, according to Real Property Appraisal Cards 0943 and 0944, which describe the building as a "Japanese Clubhouse" measuring 20 x 24 feet with a covered porch centered along the north façade measuring 12 x 4 feet. There is a modern covered porch addition at the northeastern corner of the building, and the building is currently used as a single-family residence. The only access to the building is through a single wooden door with a wood framed screen on the porch, which has an awning addition which extends to the north and east from the northeast corner of the original construction. Two windows are present on each of the four façades. While the interior of the building was not accessible at the time of survey, the Appraisal Cards list one toilet and one basin included in the original construction, along with a wooden ceilings and floors. Building AA has a foundation of wood beams set on concrete piers and is in fair condition (Figures 158, 159, and 160).



Figure 158. Building AA north façade showing covered porch, view to the south.



Figure 159. Building AA south façade taken from drainage, view to the north.



Figure 160. Pier and beam foundation beneath Building AA, view to the north.

5. SIGNIFICANCE EVALUATION, TREATMENT RECOMMENDATIONS, AND STATEMENT OF EFFECTS

As there were no archaeological resources identified within the current study area, it is our conclusion that no further archaeological work needs to be conducted prior to, or during project implementation. In the unlikely event that significant archaeological resources are discovered during the implementation of the redevelopment of the former Dole Company Operation Facility at Whitmore Village, work in the area of the discovery would cease and DLNR-SHPD contacted pursuant to HAR §13-280-3.

As a result of the current study, twenty-seven buildings were identified in the project area, twenty of which are at least 50 years old (Table 2) and are thus considered historic, and collectively constitute SIHP Site 50-80-04-xxxx.

Table 2. Individual buildings within SIHP Site 50-80-04-XXXX.

Building No.	*Description*	*Construction Date*	*Integrity*
A	Truck and Equipment Shed	1949	Yes
B	Truck and Equipment Shed	1948	Yes
C	Truck and Equipment Shed	1949	Yes
D	Truck and Equipment Shed	1948	Yes
E	Offices	1960	Yes
F	Field offices	1944/1962	No
G	Office/Kitchen building	1944?	Yes
H	Shed	1958-1962	No
I	Shed	1958-1962	No
J	Warehouse	1984	N/A
K	Greenhouse	1992	N/A
L	Greenhouse	1992	N/A
M	Greenhouse	1992	N/A
N	Warehouse/shops	1964	Yes
O	Warehouse/shops/offices	1964	Yes
P	Shop	1964	No
Q	Storeroom	1964	Yes
R	Small greenhouse	1972/73	N/A
S	Large greenhouse	1972/73	N/A
T	Warehouse	1964	Yes
U	Warehouse	1964	No
V	Quonset hut	1949	No
W	Warehouse	1962/63	No
X	Quonset hut	1941	No
Y	Soil fumigant tank storage	1985	N/A
Z	Community recreation building	1936	Yes
AA	Japanese clubhouse	1949	No

The individual components of Site 50-80-04-XXXX are assessed for their significance based on criteria contained in HAR §13-275-6. For a resource to be considered significant it must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

a Be associated with events that have made an important contribution to the broad patterns of our history;

b Be associated with the lives of persons important in our past;

c Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

d Have yielded, or be likely to yield, information important for research on prehistory or history;

e Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

Integrity is the ability of a property to convey its significance. The NPS publication *How to Apply the National Register Criteria for Evaluation* (NRHP Bulletin No. 15) provides guidelines for how to evaluate the integrity of a property. The evaluation of integrity must be grounded in an understanding of a property's physical features and how they relate to the concept of integrity. Determining which of these aspects are most important to a property requires knowing why, where, and when a property is significant. To retain historic integrity, a property must possess several, and usually most, aspects of integrity:

> *Location* is the place where the historic property was constructed or the place where the historic event occurred.
>
> *Design* is the combination of elements that create the form, plan, space, structure, and style of a property.
>
> *Setting* is the physical environment of a historic property, and refers to the character of the site and the relationship to surrounding features and open space. Setting often refers to the basic physical conditions under which a property was built and the functions it was intended to serve. These features can be either natural or manmade, including vegetation, paths, fences, and relationships between other features or open space.
>
> *Materials* are the physical elements that were combined or deposited during a particular period or time, and in a particular pattern or configuration to form a historic property.
>
> *Workmanship* is the physical evidence of crafts of a particular culture or people during any given period of history or prehistory, and can be applied to the property as a whole, or to individual components.
>
> *Feeling* is a property's expression of the aesthetic or historic sense of a particular period of time. It results from the presence of physical features that, when taken together, convey the property's historic character.
>
> *Association* is the direct link between the important historic event or person and a historic property (NPS 1997:44-45).

The historic buildings identified within the study area are evaluated based on themes preliminarily developed pertaining to the former Dole Company Operations Facility that are intended to establish the historical significance of the property. Themes can reflect historical patterns; significant events, persons, and activities; and environmental, social, and cultural influences relevant to historical contexts within the study area. For the current evaluation, properties are considered for significance for their association with the history and development of pineapple production under the broader themes of Agriculture and Economy in Hawai‘i.

For this evaluation, we carefully considered whether any of the twenty buildings or structures within Site XXXX that meet the age threshold of 50 years are individually significant historic properties. Although the subject property is associated with the development of the pineapple industry in Hawai‘i, and the Dole Company (Hawaiian Pineapple Company) in particular, the majority of the buildings are common warehouse and industrial properties, and as individual resources none of these sufficiently represent the themes developed for this evaluation; neither do the three office/meeting buildings (Buildings E, F, and G) or the community buildings (Buildings Z and AA). As such, none of the buildings within the study area are recommended individually significant under Criterion a.

In research conducted for this report, we found no evidence that any historically important persons were associated with the property to the extent defined in NPS Guidelines (NPS Bulletin No. 15). Although James Dole was a demonstrably important figure in Hawai‘i's history and economy, the Whitmore Village property is not a good representation of his contributions. He did not live at the property, and he did not spend most of his productive life at the property. The construction of Whitmore Village in the late 1940s post-dates by many years Dole's primary activities in developing the company in the early twentieth century. Dole pineapple production facilities were located throughout the Hawaiian Islands, and Whitmore Village played only a relatively minor role in the pineapple industry at large. For these reasons, none of the buildings at the project site are recommended individually significant under Criterion b.

We carefully considered whether the buildings in the study area are significant under Criterion c for architecture. Most of the buildings and structures surveyed are common warehouse and industrial properties, and as individual resources none sufficiently represents the themes established for the evaluation of the property. They are not good or outstanding representations of a recognized architectural style. Additionally, no evidence was found that any of the buildings are associated with a master architect or engineer. As such, none of the buildings are recommended individually significant under Criterion c.

We also considered whether the buildings in the study area are significant under Criterion d for having yielded, or being likely to yield, information important for research on prehistory or history. None of the buildings documented are recommended individually significant under Criterion d because they are common property types that do not have the potential to provide information about history that is not available through historic research.

None of the buildings studied are recommended individually significant under Criterion e because they do not have important traditional cultural value to the native Hawaiian people or to another ethnic group of the state for associations with traditional cultural practices once carried out, or still carried out, at the property or for associations with traditional beliefs, events, or oral accounts.

Although none of the buildings are individually significant under any criteria, collectively, Site XXXX is considered significant under Criterion d for the information generated as a result of the current study. However, no further mitigation work is recommended, as the current study has sufficiently documented the site.

POTENTIAL HISTORIC DISTRICT CONSIDERATIONS

Further consideration was given as to whether any of the buildings within the current study area could be contributing resources to an as of yet undefined historic district. Although outside of the scope of the current study, a preliminary assessment was made relative to buildings within the current project area that could be considered to be a part of what might be termed the Hawaiian Pineapple Company/Dole Plantation at Whitmore Village Historic District, if such a district were to be defined. The buildings under consideration within the current study area are all of those that were built prior to 1969 and include Buildings A, B, C, D, E, F, G, H, I, N, O, P, Q, T, U, V, W, X, Z and AA (see Figure 35 and Table 2), while the potential historic district boundary would be what is shown on the 1942 (with updates through 1957) Sanborn Fire Insurance Company map (see Figure 30) and is visible as a seemingly cohesive geographic unit on a 1962 aerial photograph (see Figure 31).

Following the guidelines for identifying and classifying resources as a historic district, groups of resources constructed in the same period of time, in the same geographical area, and serving the same mission or function may be significant as historic districts. A group of properties that would not be individually significant might be significant together as a group. It is possible that a historic district associated with a particular theme might be composed of a series of different types of buildings that were built at different times. The National Park Service (NPS) Bulletin No. 15: *How to Apply the National Register Criteria for Evaluation* provides guidelines for evaluating the integrity of a historic district (NPS 1997:46).

For a district to retain integrity as a whole, *the majority of the elements that make up the district's historic character must possess integrity even if they are individually undistinguished*. In addition, *the relationships among the district's elements must be substantially unchanged since the period of significance*.

When evaluating the impact of intrusions on the district's integrity, the relative number, size, scale, design, and location of the components that do not contribute to the significance of the district should be considered. A district is not significant if it contains so many alterations or new intrusions that it no longer conveys the sense of a historic environment. However, some new properties, the loss of original landscape features, or the construction of additions to original buildings and structures may be acceptable. Some level of alteration is acceptable, as long as the original form and layout of the district is mostly intact. An element of a district cannot contribute to the significance of the district if:

1. it has been substantially altered since the period of the district's significance, or
2. it does not share the historic associations of the district (NPS 1997:46).

Hawai'i Administrative Rules (HAR) provide similar but less detailed information for consideration of a historic district. "'District' means a geographically definable area, urban or rural, possessing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united by past events or aesthetically by plan or physical development. A district may also comprise individual elements separated geographically but linked by association or history" (HAR §13-275-2).

Hawaiian Pineapple Company/Dole Plantation at Whitmore Village

ASM considered whether the twenty Historic buildings (Buildings A, B, C, D, E, F, G, H, I, N, O, P, Q, T, U, V, W, X, Z and AA; see Figure 35 and Table 2) within the current study area could be contributing resources to a potential historic district related to the Hawaiian Pineapple Company/Dole Plantation. The boundary of the potential district would be what is depicted on the 1942 (with updates through 1957) Sanborn Fire Insurance Company map (see Figure 30) and what is visible as a seemingly cohesive geographic unit on a 1962 aerial photograph (see Figure 31), with

later (1964) infilling with several structures. The potential period of significance for the district would begin in 1936, when the first buildings were constructed at Whitmore Village, and end in 1968, following NRHP guidelines recommending 50 years ago as the end of the period of significance when activities continue to have importance and no more specific date can be defined (NPS 1997:42).

The potential historic district would likely be evaluated for significance under the theme of Agriculture and Economy in Hawai‘i with sub-themes of pineapple production and labor; and the theme of Community Planning & Development with sub-themes of labor, recreation, and commerce. Associated property types might include single- and multi-family residences, commercial buildings, office buildings, recreation buildings, family gardens and small greenhouses, warehouses, equipment sheds, greenhouses, and machine shops. As many of the initial residents of Whitmore Village were Filipino and Japanese immigrants, the theme of Ethnic Heritage might also apply.

Although a comprehensive evaluation of the potential historic district is outside of the scope of the current study, a brief windshield survey, augmented by a comparison of the 1942-1957 Sanborn map and a series of historical aerial images with 2018 aerial views, indicates that many of the former warehouse buildings are no longer extant and that nearly all worker housing have been extensively altered. There have also been many additional structures added to the area after is period of significance. Therefore, the Hawaiian Pineapple Company/Dole Plantation historic district would likely not be considered significant because it lacks sufficient integrity to a potential period of significance to sufficiently convey its historical character and associations.

The present-day Whitmore Village area does not appear to represent the themes of Agriculture and Economy in Hawai‘i as well as other districts that have been determined eligible for listing in the NRHP. An example is the NRHP-listed Kunia Camp, which is a much more comprehensive and intact group of resources related to the various functions of a pineapple plantation and a better representation of the broad themes of Agriculture and Economy. Kunia Camp is located within four miles of the study area and includes 128 contributing housing, commerce, recreation, retail, and religious properties, all serving the California Packing Company and its employees. The camp was found significant under Criteria A and C of the NRHP as a historic district with a residential community/camp theme, with areas of significance of agriculture, architecture, and community planning and development. The Kunia Camp NRHP nomination form further indicates that while shops, storerooms, storage and warehouse buildings (such as those within the current study area) are an integral part of the functioning plantation, they are not considered contributors because of the lack of individual significance (NRHP #14000970).

STATEMENT OF EFFECTS

Given the above findings, analyses, and discussion, with respect to both archaeological and architectural resources, the effects determination for the proposed Whitmore Agricultural project is no historic properties affected.

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APPENDIX A

Real Property Tax Records

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

ATTR.

1. DEPRECIATION .960

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1936	28	25	32	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ____
Ret. Walls ☐ Sprinklers ____
Lawn-Ldsc. ☐ Fences ____

REMARKS WASN'T PREVIOUSLY ASSESSED

CARD 1 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 69

4.

5. ADDRESS WHITMORE

6. CODE 8000

7. USE
COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	980	5.62	5503		2078		2195		2170		2187		2258
		Appx.	186		1971		1972 - 1973		1973 - 1974		1974 - 1975		1975 - 1976
			5697		2341		2348		2240		2492		2777
			x 1.08		1976 - 1977		1977		78		1979		1980
			6150		2380		2342		2466		2697		2718
		32%	1968		1981		1982		1983		1984		1985
					2870		3168		5702		5753		6524
					1986		1987		84				
					6850		7056		7268				

DESCRIPTION OF IMPROVEMENTS

CARD 1 OF 1 CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 (09)

SURVEY BY C. YOUNG

DATE 7/21/64

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
CLUBHOUSE

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☑ PLY BD ☐
CEILING HEIGHT 10'

16. ROOF STRUCTURE
WOOD ☑
STEEL ☐
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☑
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☐

Community Recreation Bldg.
29 x 35 = 980 ft

11. UNITS AND ROOMS
NO. OF STORIES 1 HEIGHT Avg. 12 FT.
NO. OF UNITS 1
NO. OF ROOMS 1

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☑	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐

13. FLOORS

STRUCTURE		FLOORING	
WOOD JOIST	☐	PINE	☐
CONCRETE JOIST	☐	CONCRETE	☑
STEEL JOIST	☐	CERAMIC TILE	☐
CONCRETE SLAB	☑	ASPHALT	☐
CONCRETE PILES	☐		

Community Recreation Bldg. 35

29

14. EXTERIOR WALLS

STRUCTURE		EXT. FINISH	
REINF. CONCRETE	☐	PLASTER	☐
CONCRETE TILE	☐	FACE BRICKS	☐
STONE/ROCKS	☐	STONE	☐
STEEL/METAL	☐	METAL	☐
WOOD	☑	B/B	
		PARTY WALL	☐

GLASS/VITROLITE OR_____
STORE FRONT_____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT_____

21. ELECTRICAL
OUTLETS: FEW ☑ STD ☐ AMP ☐
FIXTURES CH ☑ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER ____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER ____ %

25. CLASSIFICATION
CLASS W S/CI 2-
BY CY. 12

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE_____ MAT._____
PARTITIONS:
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET	1			110
URINAL				
BASIN	1			76
SH STALL				
SINK				
SUB TOTAL – PLUMBING				186

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					186

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

ATTR: PAL

CARD 1 OF 4 CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 (09)

4.

5. WHITNOVER
ADDRESS

6. CODE E9 - -

7. USE
COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

1. DEPRECIATION 1950

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1949	15	20	46	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ☐
Ret. Walls ☐ Sprinklers ☐
Lawn-Ldsc. ☐ Fences ☐

REMARKS Wasn't previously assessed

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	528	512	2703		1500		1568		1534		1430		1563
		Appl.	186										
			2889		1971		1972 - 1973		1973 - 1974		1974 - 1975	1975 -	1976
			x 1.08		1604	4	1592		1503		1656		1825
			3120										
					1976 - 1977		1977		78		1979		1980
		46%	1435		1564		1523		1481		1783		1280
					1981		1982		1983		1984		1985
					1338		1462		2605		2601		2950
					1986		1987		86				
					3098		3191		3287				

DESCRIPTION OF IMPROVEMENTS

CARD 2V OF _____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C.YOUNG

DATE 7/21/64

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
CLUBHOUSE

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☑ PLY BD ☐
CEILING HEIGHT 8'

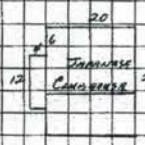
16. ROOF STRUCTURE
WOOD ☑
STEEL ☐
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☑
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☐

Japanese Clubhouse
4 X 12 = 48
20 X 24 = 480
528 sf



19. INTERIOR FINISH
STRUCTURE FINISH
TYPE MAT.
PARTITIONS:
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

11. UNITS AND ROOMS
NO. OF STORIES 1 HEIGHT 10 FT.
NO. OF UNITS 1
NO. OF ROOMS 1

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☐	CONCRETE ☐	WOOD ☑
MASONRY ☐	MASONRY ☐	CONCRETE ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET	1			110
URINAL				
BASIN	1			76
SH STALL				
SINK				
SUB TOTAL – PLUMBING				186

13. FLOORS

STRUCTURE	FLOORING
WOOD JOIST ☑	PINE ☑
CONCRETE JOIST ☐	CONCRETE ☐
STEEL JOIST ☐	CERAMIC TILE ☐
CONCRETE SLAB ☐	ASPHALT ☐
CONCRETE PILES ☐	

14. EXTERIOR WALLS

STRUCTURE	EXT. FINISH
REINF. CONCRETE ☐	PLASTER ☐
CONCRETE TILE ☐	FACE BRICKS ☐
STONE/ROCKS ☐	STONE ☐
STEEL/METAL ☑	METAL ☐
WOOD ☑	PARTY WALL ☐

GLASS/VITROLITE OR
STORE FRONT L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER. %
AVERAGE (NOR. DEP) ☑
BELOW AVER. %

25. CLASSIFICATION (USE DWL C.F.)
CLASS W S/C 1+
BY C.Y. 111

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					186

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

ATTR. PRC

CARD 1 OF 2 CARDS

ZONE 7 | SEC. 1 | PLAT 02 | PARCEL 04 (09)

4.

5. ADDRESS Whitehall

6. CODE 7800

7. USE COM'L ☐ IND. ☐ AGR. ☐ INST. ☐

1. DEPRECIATION .960

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1947	17	25	50	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY
	12/27/79	188013	4000	

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ☐
Ret. Walls ☐ Sprinklers ☐
Lawn-Ldsc. ☐ Fences ☐

REMARKS

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	960	5.62	5395		3132		3307		3370		3496		3401
		AVG.	98										
			5493		1971		1972 - 1973		1973 - 1974		1974 - 1975	1975	- 1976
			x 1.08		3526		3537		3376		3760		4189
			5932		1976 - 1977		1977		78		1979		1980
		50%	2966		3590		3532		3406		3143		3168
					1981		1982		1983		1984		
					3545		3693		6647		1713 BLDG ADJ		

07 C 40 C3

DESCRIPTION OF IMPROVEMENTS

CARD 1 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. Young

DATE 7/21/64

9. USE TYPE
STORE ☐ OFFICE ☑
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
Acoustic ✓
CEILING HEIGHT 8'

16. ROOF STRUCTURE
WOOD ☐
STEEL ☑
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☑

Office Annex
20 x 48 = 960 sq

11. UNITS AND ROOMS
NO. OF STORIES 1 HEIGHT Apx. 10' FT.
NO. OF UNITS 1
NO. OF ROOMS 2

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☐	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐
		STEEL ✓

13. FLOORS

STRUCTURE	FLOORING
WOOD JOIST ☐	PINE ☑
CONCRETE JOIST ☐	CONCRETE ☐
STEEL JOIST ☑	CERAMIC TILE ☐
CONCRETE SLAB ☐	ASPHALT ☐
CONCRETE PILES ☐	

Field Office Annex 20
(Copier Room & Mens Room)
1 HR

BLDG DEMO
PER C. TOM (CASTLE & COOKE)
SCHEDULE
1/10/64 RS

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE ____ MAT. ____
PARTITIONS: ____
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☑	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET				
URINAL				
BASIN				
SH STALL				
SINK	1			98
SUB TOTAL – PLUMBING				98

14. EXTERIOR WALLS

STRUCTURE	EXT. FINISH
REINF. CONCRETE ☐	PLASTER ☐
CONCRETE TILE ☐	FACE BRICKS ☐
STONE/ROCKS ☐	STONE ☐
(P/W) STEEL/METAL ☑	METAL ☑
WOOD ☐	
	PARTY WALL ☐

GLASS/VITROLITE OR ____
STORE FRONT ____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT ____

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☑ AMP ☐
FIXTURES CH ☐ MED ☑ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER ____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER ____ %

25. CLASSIFICATION
CLASS Comm. W S/CL 2-
BY C.Y. 132

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					98

-J-C 40 C3

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

2 Plus

4 TR. 7

CARD 1 OF 1 CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 (09)

1. DEPRECIATION — 950

B. NO.	YR. CONSTR.	AGE 1965	LIFE EXP.	% GD.	ADJ %
	1954	10	20	60	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ☐
Ret. Walls ☐ Sprinklers ☐
Lawn-Ldsc. ☐ Fences ☐

REMARKS

4.

5. ADDRESS Whitmer

6. CODE 5

7. USE

COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	800	3.21	2568		1739		1817		1778		1774		1811
			x 1.08		1971		1972 - 1973		1973 - 1974		1974 - 1975		1975 - 1976
			2773		1858		1845		1743		1921		2117
		60%	1664		1976 - 1977		77		78		1979		1980
					1814		1902		1905		2067		2098
					1981		1982		1983		1984		1985
					2227		2433		4175		4029		4341
					1986		1987		4146				
					4330		4237						

00 C 0 C3

DESCRIPTION OF IMPROVEMENTS

CARD 1 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. YOUNG

DATE 7/21/64

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
STORAGE

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
PLAIN
CEILING HEIGHT 8'

16. ROOF STRUCTURE
WOOD ☑
STEEL ☐
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☐
BOLTED TIMBER

STORAGE
16 X 50 = 800 SQ FT

11. UNITS AND ROOMS
NO. OF STORIES 1 HEIGHT AVG. 10 FT.
NO. OF UNITS 1
NO. OF ROOMS 1

PORTABLE PAINT SHED 16
50

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☐	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐

13. FLOORS

STRUCTURE	FLOORING
WOOD JOIST ☐	PINE ☐
CONCRETE JOIST ☐	CONCRETE ☐
STEEL JOIST ☐	CERAMIC TILE ☐
CONCRETE SLAB ☐	ASPHALT ☑
CONCRETE PILES ☐	

14. EXTERIOR WALLS

STRUCTURE	EXT. FINISH
REINF. CONCRETE ☐	PLASTER ☐
CONCRETE TILE ☐	FACE BRICKS ☐
STONE/ROCKS ☐	STONE ☐
STEEL/METAL ☑	METAL ☑
WOOD ☐	
	PARTY WALL ☐

GLASS/VITROLITE OR ____
STORE FRONT ____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT ____

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER ____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER ____ %

25. CLASSIFICATION
CLASS S/I WASH./MAZAC
S/CI
BY CM 341

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE ____ MAT. ____
PARTITIONS: ____
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET				
URINAL				
BASIN				
SH STALL				
SINK				
SUB TOTAL – PLUMBING				

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
				SUB TOTAL DETAILS	
				TOTAL ITEMS 26 & 27	

40 C 40 C3

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

ATTR. PRC

3 4

1. DEPRECIATION -950

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1954	10	20	60	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY

3. ADD'L L IMPVTS.

Paved Areas ☐ Walkways ____
Ret. Walls ☐ Sprinklers ____
Lawn-Ldsc. ☐ Fences ____

REMARKS

CARD ____ OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 (09)

4.

5. ADDRESS Whitmore

6. CODE 5

7. USE
COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	1550	3.00	4650		3148		3290		3319		3311		3279
			x 1.08										
			5022		1971		1972 - 1973		1973 - 1974		1974 - 1975		1975 - 1976
					3364		3340		3155		3477		3331
		60%	3013		1976 - 1977		77		78		1979		1980
					3284		3444		3429		4286		4162
					1981		1982		1983		1984		1784
					4033		4406		7763		7300		7864
					1986		387		88				
					7845		7677		7512				

DESCRIPTION OF IMPROVEMENTS

CARD 1 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. YOUNG

DATE 7/21/64

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
STORAGE

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
PLAIN
CEILING HEIGHT 8'

16. ROOF STRUCTURE
WOOD ☑
STEEL ☐
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☐
BOLTED TYPE

Storage
9 x 30 = 270
16 x 30 = 1280
1550 ft

EXP. & ENC. SHED

11. UNITS AND ROOMS
NO. OF STORIES 1 HEIGHT AVG 10 FT.
NO. OF UNITS 1
NO. OF ROOMS 2

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☐	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐

13. FLOORS

STRUCTURE		FLOORING	
WOOD JOIST	☐	PINE	☐
CONCRETE JOIST	☐	CONCRETE	☐
STEEL JOIST	☐	CERAMIC TILE	☐
CONCRETE SLAB	☐	ASPHALT	☑
CONCRETE PILES	☐		

14. EXTERIOR WALLS

STRUCTURE		EXT. FINISH	
REINF. CONCRETE	☐	PLASTER	☐
CONCRETE TILE	☐	FACE BRICKS	☐
STONE/ROCKS	☐	STONE	☐
STEEL/METAL	☐	METAL	☑
WOOD	☐		

PARTY WALL ☐

GLASS/VITROLITE OR ____
STORE FRONT ____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT ____

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER ____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER ____ %

25. CLASSIFICATION
CLASS S/F WH SH/MAT'L S/C
BY C.Y. 34

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE ____ MAT. ____
PARTITIONS:
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET				
URINAL				
BASIN				
SH STALL				
SINK				
SUB TOTAL — PLUMBING				

27. ADD'L IMPT DETAILS

ITEM	RP	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					

-- 0160

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

PRC CD 20

ATTR.

1. DEPRECIATION .950

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1949	15	20	46	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ☐
Ret. Walls ☐ Sprinklers ☐
Lawn-Ldsc. ☐ Fences ☐

REMARKS

CARD 8 OF 10 CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

4.

5. ADDRESS WHITHORN

6. CODE 78--

7. USE
COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	9954	1.24	12343		6408		6697		6253		6537		6676
		x 1.08											
			13330		1971		1972 - 1973		1973 - 1974		1974 - 1975		1976
		46%	6132		6850		6800		6424		7079		7201
					1976 - 1977		1977		78		1979		1980
					6686		6511		6878		6837		6820
					1981		1982		1983		1984		1985
					7127		7787		13872		13850		15706
					1985		1987		82				
					16491		16986		17496				

DESCRIPTION OF IMPROVEMENTS

CARD 1X OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. YOUNG

DATE 7/21/64

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
PARKING SHED

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☐
BOILER TUBES

11. UNITS AND ROOMS
NO. OF STORIES 1 HEIGHT AVR. 14 FT.
NO. OF UNITS 1
NO. OF ROOMS 1

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☐	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐
		PIPE ✓

13. FLOORS

STRUCTURE		FLOORING	
WOOD JOIST	☐	PINE	☐
CONCRETE JOIST	☐	CONCRETE	☐
STEEL JOIST	☐	CERAMIC TILE	☐
CONCRETE SLAB	☐	ASPHALT	☑
CONCRETE PILES	☐		

14. EXTERIOR WALLS

STRUCTURE		EXT. FINISH	
REINF. CONCRETE	☐	PLASTER	☐
CONCRETE TILE	☐	FACE BRICKS	☐
STONE/ROCKS	☐	STONE	☐
STEEL/METAL	☑	METAL (Par.)	☑
WOOD	☐	Open	
		PARTY WALL	☐

GLASS/VITROLITE OR ____
STORE FRONT ____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT ____

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
PLAIN
CEILING HEIGHT 12'

16. ROOF STRUCTURE
WOOD ☐
STEEL ☑
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

PARKING SHED
63 x 158 = 9954 ft

TRUCK & EQUIPMENT SHED
(63 x 14)
158

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE ____ MAT. ____
PARTITIONS: ____
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET				
URINAL				
BASIN				
SH STALL				
SINK				
SUB TOTAL – PLUMBING				

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☑ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐ ____

23. REMARKS

24. CONDITION
BETTER THAN AVER ____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER ____ %

25. CLASSIFICATION (USA 6/7 C.A. Pow. Net.)
CLASS S/E S/S Misc.
BY C.Y. 199

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
				SUB TOTAL DETAILS	
				TOTAL ITEMS 26 & 27	

W W 40 C3

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

ATTR. PRC 10.21

1. DEPRECIATION

1950

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1949	15	20	46	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ____
Ret. Walls ☐ Sprinklers ____
Lawn-Ldsc. ☐ Fences ____

REMARKS ____

CARD ____ OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

5. ADDRESS WHITNOCK

6. CODE 98 - [illegible]

7. USE

COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	5846	124	7249		3763		3932		3847		3837		3918
			x 1.08		1971		1972 - 1973		1973 - 1974		1974 - 1975		1975 - 1976
			7829		4020		3991		3769		4154		4177
		46%	3601		1976 - 1977		1977		78		1979		1980
					3923		3820		4006		4012		4002
					1981		1982		1983		1984		1985
					4182		4569		8740		8127		9276
					1986		1987		86				
					9677		9967		10266				

C 4 6 C3

DESCRIPTION OF IMPROVEMENTS

CARD 1 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. YOUNG

DATE 7/21/64

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
Packing Shed

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
Plain
CEILING HEIGHT 12'

16. ROOF STRUCTURE
WOOD ☐
STEEL ☑
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☐
Boiler Tubes

Packing Shed
37 X 158 = 5846 ft

Truck & Equipment Shed
37
158

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE ____ MAT. ____
PARTITIONS
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

11. UNITS AND ROOMS
NO. OF STORIES 1 AVG. HEIGHT 14 FT.
NO. OF UNITS 1
NO. OF ROOMS 1

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☐	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐
		Pipe ✓

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET				
URINAL				
BASIN				
SH STALL				
SINK				
SUB TOTAL – PLUMBING				

13. FLOORS

STRUCTURE		FLOORING	
WOOD JOIST	☐	PINE	☐
CONCRETE JOIST	☐	CONCRETE	☐
STEEL JOIST	☐	CERAMIC TILE	☐
CONCRETE SLAB	☐	ASPHALT	☑
CONCRETE PILES	☐		

14. EXTERIOR WALLS

STRUCTURE		EXT. FINISH	
REINF. CONCRETE	☐	PLASTER	☐
CONCRETE TILE	☐	FACE BRICKS	☐
STONE/ROCKS	☐	STONE	☐
STEEL/METAL	☐	METAL (Pnt.)	☑
WOOD	☐	Plain	
		PARTY WALL	☐

GLASS/VITROLITE OR ____
STORE FRONT ____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT ____

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER ____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER ____ %

25. CLASSIFICATION
CLASS S/I S/CI MISC.
BY CY 99

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

ATTR.

1. DEPRECIATION .950

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1948	14	20	49	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ☐
Ret. Walls ☐ Sprinklers ☐
Lawn-Ldsc. ☐ Fences ☐

REMARKS

CARD 12 OF ___ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 69

5. ADDRESS WHITAKER

6. CODE

7. USE
COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	9250	124	11470		6343		6628		6485		6469		6607
		x 1.08	12388		1971		1972 - 1973		1973 - 1974		1974 - 1975		1975 - 1976
		49%	6070		6779	12	6730		6358		7006		7221
					1976 - 1977		1977		78		1979		1980
					6618		6444		6759		6768		6752
					1981		1982		1983		1984		1985
					7052		7707		13728		13707		15549
					1986		1987		89				
					16321		16811		17315				

DESCRIPTION OF IMPROVEMENTS

CARD 11 OF 17 CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. Young
DATE 7/21/64

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
Parking Shed

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☐
Boiler Tubes

11. UNITS AND ROOMS
NO. OF STORIES ____ AVG. HEIGHT 14 FT.
NO. OF UNITS ____
NO. OF ROOMS ____

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☐	CONCRETE ☐	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐

13. FLOORS

STRUCTURE		FLOORING	
WOOD JOIST	☐	PINE	☐
CONCRETE JOIST	☐	CONCRETE	☐
STEEL JOIST	☐	CERAMIC TILE	☐
CONCRETE SLAB	☐	ASPHALT	☐
CONCRETE PILES	☐		

14. EXTERIOR WALLS

STRUCTURE		EXT. FINISH	
REINF. CONCRETE	☐	PLASTER	☐
CONCRETE TILE	☐	FACE BRICKS	☐
STONE/ROCKS	☐	STONE	☐
STEEL/METAL	☐	METAL	☐
WOOD	☐		
		PARTY WALL	☐

GLASS/VITROLITE OR ____
STORE FRONT ____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT ____

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
Plain
CEILING HEIGHT 12'

16. ROOF STRUCTURE
WOOD ☐
STEEL ☐
CONCRETE ☐

17. ROOF DESIGN
GABLE ☐ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☐ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

Parking Shed
37 x 250 = 9250 ft

37
Truck & Equipment Shed
250

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE ____ MAT. ____
PARTITIONS: ____
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET				
URINAL				
BASIN				
SH STALL				
SINK				
SUB TOTAL – PLUMBING				

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER ____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER ____ %

25. CLASSIFICATION
CLASS S/E S/O MISC.
BY: C.Y. 199

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					

J 5 4 0 C 3

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

PRC ch. 22

ATTR.

1. DEPRECIATION .950

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1948	14	20	49	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY

3. ADD'L L IMPVTS.

Paved Areas ☐ Walkways ____
Ret. Walls ☐ Sprinklers ____
Lawn-Ldsc. ☐ Fences ____

REMARKS ____

CARD 1 OF 3 CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 (09)

5. ADDRESS WHITMORE

6. CODE 48

7. USE
COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	15750	124	19530		11140		11641		11391		11363		11605
		Roofs	614										
			20144		1971		1972 - 1973		1973 - 1974		1974 - 1975		1975 - 1978
			x 1.08		11907	12	11821		11166		12305		13560
			21756		1976 - 1977		1977		78		1979		1980
		49%	10660		11622		11317		11569		11585		11856
					1981		1982		1983		1984		1985
					12389		13536		24110		24073		27299
					1986		1987		82				
					28664		29524		30410				

COUNTY

DESCRIPTION OF IMPROVEMENTS

CARD 15 OF _____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. YOUNG

DATE 7/21/64

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK. ☐
SERV. STA. ☐ THEATRE ☐
PARKING SHED

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
PLAIN
CEILING HEIGHT 8'

16. ROOF STRUCTURE
WOOD ☐
STEEL ☑
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☑
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☐

Parking Shed
63 x 250 = 15750 SF

63 A

Truck & Equipment Shed

250

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE _____ MAT. _____
PARTITIONS: _____
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

11. UNITS AND ROOMS
NO. OF STORIES 1 HEIGHT 10 FT.
NO. OF UNITS 1
NO. OF ROOMS 1

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☑	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET	2			220
URINAL	2			242
BASIN	2			152
SH STALL				
SINK				
SUB TOTAL — PLUMBING				614

13. FLOORS

STRUCTURE		FLOORING	
WOOD JOIST	☐	PINE	☐
CONCRETE JOIST	☐	CONCRETE	☑
STEEL JOIST	☐	CERAMIC TILE	☐
CONCRETE SLAB	☑	ASPHALT	☐
CONCRETE PILES	☐		

14. EXTERIOR WALLS

STRUCTURE		EXT. FINISH	
REINF. CONCRETE	☐	PLASTER	☐
CONCRETE TILE	☐	FACE BRICKS	☐
STONE/ROCKS	☐	STONE	☐
STEEL/METAL	☐	METAL	☐
WOOD	☑		
		PARTY WALL	☐

GLASS/VITROLITE OR _____
STORE FRONT _____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT _____

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER _____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER _____ %

25. CLASSIFICATION
CLASS S/E S/C Misc.
BY C.Y. 199

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
				SUB TOTAL DETAILS	
				TOTAL ITEMS 26 & 27	614

40 40 40 03

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

NO. 1 BLDG. I OF

ATTR. 78 17 PR

CARD ZONE 170 SEC. OF PLAT CARDS PARCEL

4. 7 / 02 04 E9

5. ADDRESS WHITMORE

6. CODE 5

7. USE COM'L ☐ IND. ☐ AGR. ☐ INST. ☐

1. DEPRECIATION .975

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1964	N	40	100	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY
NEW STR.	1/6/64	217331	45000	DELK CORP.

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ☐
Ret. Walls ☐ Sprinklers ☐
Lawn-Ldsc. ☐ Fences ☐

REMARKS

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	6400	2.78	17792		21196		22733		24480		23377		24497
		Area	507		1971		1972 - 1973		1973 - 1974		1974 - 1975		1975 - 1976
			18299		25795	18	26282		25498		26819		32594
			x 1.09		1976 - 1977		77		78		1979		1980
		100%	19763		27936		30071		27804		33487		35357
					1981		1982		1983		1984		1985
					35162		39425		69447		68794		76062
					1986		1987		86				
					77868		78199		78531				

C3 07 40 C3

DESCRIPTION OF IMPROVEMENTS

CARD 6 OF _____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. YOUNG

DATE 7/23/64

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
SHOPS

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
GRAIN
CEILING HEIGHT 12'

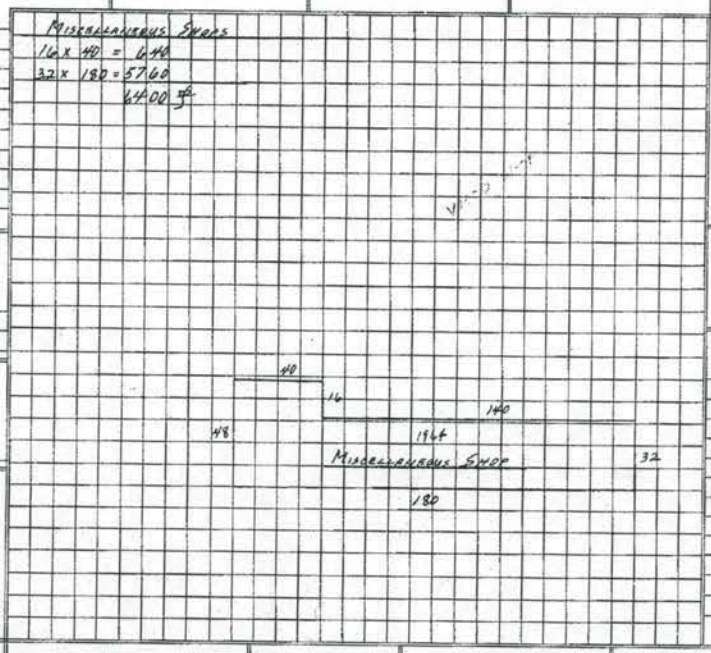
16. ROOF STRUCTURE
WOOD ☐
STEEL ☑
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☑

Miscellaneous Shops
16 x 40 = 640
32 x 180 = 5760
6400 SF



19. INTERIOR FINISH
STRUCTURE FINISH
TYPE _____ MAT. _____
PARTITIONS: _____
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

11. UNITS AND ROOMS
NO. OF STORIES 1 HEIGHT Aver. 16 FT.
NO. OF UNITS 1
NO. OF ROOMS 6

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☑	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET		2		226
URINAL		1		121
BASIN		2		160
SH STALL				
SINK				
SUB TOTAL – PLUMBING				507

13. FLOORS

STRUCTURE		FLOORING	
WOOD JOIST	☐	PINE	☐
CONCRETE JOIST	☐	CONCRETE	☑
STEEL JOIST	☐	CERAMIC TILE	☐
CONCRETE SLAB	☑	ASPHALT	☐
CONCRETE PILES	☐		

14. EXTERIOR WALLS

STRUCTURE		EXT. FINISH	
REINF. CONCRETE	☐	PLASTER	☐
CONCRETE TILE	☐	FACE BRICKS	☐
STONE/ROCKS	☐	STONE	☐
STEEL/METAL	☑	METAL	☑
WOOD	☐		
		PARTY WALL	☐

GLASS/VITROLITE OR _____
STORE FRONT _____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT _____

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐ _____

23. REMARKS

24. CONDITION
BETTER THAN AVER. _____ %
AVERAGE (NOR. DEP.) ☑
BELOW AVER. _____ %

25. CLASSIFICATION
CLASS SHP Misc/Maint
BY C.Y. 342

27. ADD'L IMPT DETAILS

ITEM	RP	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					507

-- 0140 C3

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

CO. 1 BLDG. 2

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

ATTR.

O/C PRC

1918

CARD 20078F

ZONE	SEC.	PLAT	CARDS PARCEL
7	1	02	04 09

4.

5. WALTHAM
ADDRESS

6. CODE 5

7. USE
COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

1. DEPRECIATION .975

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1964	N	40	100	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY
WAREHSE.	11/64	217330	31,000	Pole Const.

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ☐
Ret. Walls ☐ Sprinklers ☐
Lawn-Ldsc. ☐ Fences ☐

REMARKS

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	6000	2.78	16680		20022		21473		21564		22076		23138
		Addl.	605		1971		1972 - 1973		1973 - 1974		1974 - 1975		1975 - 1976
			17285		24364		24824		24067		27219		30785
		100%	x 1.08		1976 - 1977		77		78		1979		1980
			18668		26386		28402		26990		32515		33396
					1981		1982		1983		1984		1985
					33212		31239		67797		64980		71846
					1986		1987		88				
					73553		73865		74179				

DESCRIPTION OF IMPROVEMENTS

CARD 9 OF _____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. Young

DATE 7/23/64

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
Warehouse

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☑

11. UNITS AND ROOMS
NO. OF STORIES 1 AVG HEIGHT 16 FT.
NO. OF UNITS 1
NO. OF ROOMS 1

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☑	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐

13. FLOORS

STRUCTURE	FLOORING
WOOD JOIST ☐	PINE ☐
CONCRETE JOIST ☐	CONCRETE ☑
STEEL JOIST ☐	CERAMIC TILE ☐
CONCRETE SLAB ☑	ASPHALT ☐
CONCRETE PILES ☐	

14. EXTERIOR WALLS

STRUCTURE	EXT. FINISH
REINF. CONCRETE ☐	PLASTER ☐
CONCRETE TILE ☐	FACE BRICKS ☐
STONE/ROCKS ☐	STONE ☐
STEEL/METAL ☑	METAL ☑
WOOD ☐	
	PARTY WALL ☐

GLASS/VITROLITE OR _____
STORE FRONT _____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT _____

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
PLAIN
CEILING HEIGHT 12'

16. ROOF STRUCTURE
WOOD ☐
STEEL ☑
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TYLE ☐
BUILT-UP ☐

Storeroom & Office Bldg.
60 x 100 = 6,000 SF
Comm. Type

1964
Storeroom & Office
60
100

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE _____ MAT. _____
PARTITIONS: _____
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☑	METAL ☑	METAL ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET		2		226
URINAL		1		121
BASIN		2		160
SH STALL				
SINK	1			95
SUB TOTAL – PLUMBING				605

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐ _____

23. REMARKS

24. CONDITION
BETTER THAN AVER _____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER _____ %

25. CLASSIFICATION
CLASS 5½ Wood S/P Mass
BY C.Y. 347

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					605

W 07 40 C3

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

CP 8 BLDG. 3

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

ATTR. 30 21 (24) DD

1. DEPRECIATION .975

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1964	N	40	100	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ____
Ret. Walls ☐ Sprinklers ____
Lawn-Ldsc. ☐ Fences ____

REMARKS OTHER IMPROVEMENTS TAKEN INTO CONSIDERATION IN RELATION TO THE MINES OF WELLS

CARD ZONE SEC. OF PLAT CARDS PARCEL

4. 7 / 02 04 09

5. ADDRESS WHITMORE

6. CODE 5

7. USE
COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965
	13,500	2.70	36450
	ADD:		1119
			37569
		x	1.09
	100%		40,575

CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	#3517		46672		46870		47983		50292
	1971		1970 - 1971		1973 - 1974		1974 - 1975		1975 - 1976
	62957	121	53957		52312		59166		66916
	1976 - 1977		77		78	1979			1980
	57354		61736		57177		72849		72591
	1981		1982		1983		1984		1985
	72192		80945		142583		141242		156164
	1986		1987		121234				
	159873		160552						

Bldg E

CONCO

DESCRIPTION OF IMPROVEMENTS

CARD 1 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. YOUNG

DATE 7/23/64

9. USE TYPE
STORE ☐ OFFICE ☑
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
(WAREHOUSE) SHOPS

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
PLAIN
(OFFICE PORTION - ACOUSTICAL)
CEILING HEIGHT 20'

16. ROOF STRUCTURE
WOOD ☐
STEEL ☑
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☑

Office & Repair Shops
50 x 100 = 5000
50 x 170 = 8500
13,500 #

150
(Showroom)
Office
Repair Shop
50
100
170
120
Radiator Shop
50

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE ____ MAT. ____
PARTITIONS: ____
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☑

11. UNITS AND ROOMS
NO. OF STORIES ____ AVG. HEIGHT 22 FT.
NO. OF UNITS ____
NO. OF ROOMS ____

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☑	METAL ☑	METAL ☐

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☑	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐

26. PLUMBING

ITEM	CH.	MEQ	GD	VAL
TOILET		4		452
URINAL		1		121
BASIN		6		480
SH STALL	1			66
SINK				
SUB TOTAL — PLUMBING				1119

13. FLOORS

STRUCTURE	FLOORING
WOOD JOIST ☐	PINE ☐
CONCRETE JOIST ☐	CONCRETE ☑
STEEL JOIST ☐	CERAMIC TILE ☐
CONCRETE SLAB ☑	ASPHALT ☐
CONCRETE PILES ☐	

14. EXTERIOR WALLS

STRUCTURE	EXT. FINISH
REINF. CONCRETE ☐	PLASTER ☐
CONCRETE TILE ☐	FACE BRICKS ☐
STONE/ROCKS ☐	STONE ☐
STEEL/METAL ☑	METAL ☑
WOOD ☐	PORTION OPEN
	PARTY WALL ☐

GLASS/VITROLITE OR ____
STORE FRONT ____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT ____

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐ ____

23. REMARKS
Office: 4 rms, Lab Pd. partitions, P.T. Elec. Ltg. & Acoustic ceiling

24. CONDITION
BETTER THAN AVER. ____ %
AVERAGE (NOR. DEP.) ☑
BELOW AVER. ____ %

25. CLASSIFICATION
CLASS S.E. Wood/Steel Frame
BY C.Y. 347

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					1119

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

PRC

ATTR. 20 CA, 24 PLA-11

1. DEPRECIATION .975

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1964	N	40	100	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY
New Bldg.	3-10-64	21964	5,000	Penn Elec.

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ☐
Ret. Walls ☐ Sprinklers ☐
Lawn-Ldsc. ☐ Fences ☐

REMARKS Minus #448 for Mall (Lot Inc 4)

CARD 2 OF 3 CARDS

ZONE	SEC.	PLAT	PARCEL
4. 7	1	02	04 (01)

5. ADDRESS Whitmore

6. CODE 7 8 — —

7. USE
COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	1825	3.50	6388		7763		8326		8961		8560		8972
	Addn		314										
			6702		1971		1972 - 1973		1973 - 1974		1974 - 1975		1975 - 1978
			x 1.03		9448	120	9626		9332		10555		11939
		1007	7238		1976 - 1977		1977		78		1979		1980
					10232		10225		9999		10775		10519
					1981		1982		1983		1984		1985
					11282		12650		23127		23699		26203
					1985		1987		85				
					26845		26939		27054				

07 07 40 03

DESCRIPTION OF IMPROVEMENTS

CARD 3 OF _____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. Young

DATE 7/23/64

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☑ THEATRE ☐

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
Plain

CEILING HEIGHT 12'

16. ROOF STRUCTURE
WOOD ☐
STEEL ☑
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☑

Trans-Loma Service Station
25 x 73 = 1825 ft

Repair Shop

Drive Pump
W1 4

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE _____ MAT. _____
PARTITIONS: _____
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

11. UNITS AND ROOMS
NO. OF STORIES 1 Ave. HEIGHT 14 FT.
NO. OF UNITS 1
NO. OF ROOMS 1

20. MILLWORK
WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

12. FOUNDATION
FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☑	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐

26. PLUMBING
ITEM	CH.	MED	GD	VAL
TOILET		1		113
URINAL		1		121
BASIN		1		80
SH STALL				
SINK				
SUB TOTAL – PLUMBING				314

13. FLOORS
STRUCTURE	FLOORING
WOOD JOIST ☐	PINE ☐
CONCRETE JOIST ☐	CONCRETE ☑
STEEL JOIST ☐	CERAMIC TILE ☐
CONCRETE SLAB ☑	ASPHALT ☐
CONCRETE PILES ☐	

14. EXTERIOR WALLS
STRUCTURE	EXT. FINISH
REINF. CONCRETE ☐	PLASTER ☐
CONCRETE TILE ☐	FACE BRICKS ☐
STONE/ROCKS ☐	STONE ☐
STEEL/METAL ☑	METAL ☑ Por. Panel
WOOD ☐	PARTY WALL ☐

GLASS/VITROLITE OR _____
STORE FRONT _____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT _____

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER. _____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER. _____ %

25. CLASSIFICATION
Specific (Minus Walls)
CLASS S/E W&M/Metal
BY C.Y. 152

27. ADD'L IMPT DETAILS
ITEM	RF	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					314

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

ATTR. CD,9 BLD. 4 01E PP-

CARD 25 ~~23~~ OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

1. DEPRECIATION .975

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	1964	N	40	100	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY
Rec Sum	1-6-64	217332	21555	Dora Corp.

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ____
Ret. Walls ☐ Sprinklers ____
Lawn-Ldsc. ☐ Fences ____

REMARKS Minus #416 for wall. 12ft o/s.)

4. 7 / 02 04 09

5. ADDRESS WHITMORE

6. CODE 5

7. USE
COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	2560	3.17	8115		9399		10081		10114		10364		10863
			x 1.08										
		(100%)	8764		1971		1972 - 1973		1973 - 1974		1974 - 1975		1975 - 1978
					11439	.22	11655		11099		12780		14415
					1976 - 1977		77		78		1979		1980
					12389		13335		12229		15737		15682
					1981		1982		1983		1984		1985
					16596		17487		30803		30514		33738
					1986		1987		EX				
					34540		34687		34835				

DESCRIPTION OF IMPROVEMENTS

CARD 8 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 69

SURVEY BY C. Young

DATE 7/23/64

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
Shop

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☑

11. UNITS AND ROOMS
NO. OF STORIES 1 AVR HEIGHT 20 FT.
NO. OF UNITS 1
NO. OF ROOMS 1

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☑	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐

13. FLOORS

STRUCTURE	FLOORING
WOOD JOIST ☐	PINE ☐
CONCRETE JOIST ☐	CONCRETE ☑
STEEL JOIST ☐	CERAMIC TILE ☐
CONCRETE SLAB ☑	ASPHALT ☐
CONCRETE PILES ☐	

14. EXTERIOR WALLS

STRUCTURE	EXT. FINISH
REINF. CONCRETE ☐	PLASTER ☐
CONCRETE TILE ☐	FACE BRICKS ☐
STONE/ROCKS ☐	STONE ☐
STEEL/METAL ☑	METAL ☑
WOOD ☐	for. open
	PARTY WALL ☐

GLASS/VITROLITE OR ____
STORE FRONT ____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT ____

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
Plain
CEILING HEIGHT 18'

16. ROOF STRUCTURE
WOOD ☐
STEEL ☑
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

Harvester Repair Shop
32 x 80 = 2560 sf

Harvester Repair Shop

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE ____ MAT. ____
PARTITIONS: ____
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☑	METAL ☐	METAL ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET				
URINAL				
BASIN				
SH STALL				
SINK				
SUB TOTAL – PLUMBING				

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER ____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER ____ %

25. CLASSIFICATION
Specified (Mfg. Hdwe)
CLASS S/2 Shop/Machine
BY C.J. 347

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

PRC CD. 25 2106.0

ATTR. (29)73

CARD 24 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 (09)

4.

5. ADDRESS Whittier

6. CODE 78 — —

7. USE
COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

1. DEPRECIATION .930

B. NO.	YR. CONSTR.	AGE (1965)	LIFE EXP.	% GD.	ADJ %
	1960	4	50	92	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY

3. ADD'L L IMPVTS.

Paved Areas ☐ Walkways ____
Ret. Walls ☐ Sprinklers ____
Lawn-Ldsc. ☐ Fences ____

REMARKS

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	4490	8.25	37043		42328		45630		46959		47394		49931
		A004	2475										
			39518		1971		1972 - 1973		1973 - 1974		1974 - 1975		1975 - 1976
			x 1.08		52847	23	54121		52760		59955		69117
			42679										
					1976 - 1977		1977		78 9		1979		1980
		92%	39265		58417		63203		68195		70440		72483
					1981		1982		1983		1984		1985
					78136		88059		76808		166659		185212
					1986		1987		84				
					181435		183140		179477				

55

CD-JOCD

DESCRIPTION OF IMPROVEMENTS

CARD 18 OF _____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. YOUNG

DATE 9/17/60

9. USE TYPE
STORE ☐ OFFICE ☑
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
"FIREGUARD" ACOUSTIGLAZ
CEILING HEIGHT 10'

16. ROOF STRUCTURE
WOOD ☐
STEEL ☑
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☑

11. UNITS AND ROOMS
NO. OF STORIES 1 HEIGHT Avg. 12 FT.
NO. OF UNITS 1
NO. OF ROOMS 14

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☐	WOOD ☐
MASONRY ☐	MASONRY ☑	CONCRETE ☐

13. FLOORS

STRUCTURE	FLOORING
WOOD JOIST ☐	PINE ☐
CONCRETE JOIST ☐	Vinyl/CONCRETE ☑
STEEL JOIST ☐	CERAMIC TILE ☐
CONCRETE SLAB ☑	ASPHALT ☐
CONCRETE PILES ☐	

14. EXTERIOR WALLS

STRUCTURE	EXT. FINISH (Paint, etc.)
REINF. CONCRETE ☐	PLASTER ☑
(Bar.) CONCRETE TILE ☑	FACE BRICKS ☑
STONE/ROCKS ☐	STONE ☑
STEEL/METAL ☑	METAL ☐
WOOD ☐	
	PARTY WALL ☐

GLASS/VITROLITE OR _____
STORE FRONT _____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT _____

Administration Bldg.
8 x 31 = 248
82 x 101 = 4242
4490 SF

101
Administration Bldg.
50
42
31
CANAL
8'

19. INTERIOR FINISH
STRUCTURE FINISH
TYPE D/W MAT. PLASTER BOARD
PARTITIONS: Wallmanized wood studs, Plaster Board
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

20. MILLWORK (Hit. Veneer)
Jalousies

WINDOWS	DOORS	TRIM
WOOD ☑	WOOD ☑	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET		4		452
URINAL		1		121
BASIN		4		320
SH STALL				
SINK				
TRAP (S)		1		59
SUB TOTAL – PLUMBING				952

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☑
FIXTURES CH ☐ MED ☐ GD ☑

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER. _____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER. _____ %

25. CLASSIFICATION
Comm
CLASS M S/CI 4
BY CY. 234

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
Lanai (3/12)	Asph	Conc	Conc	560 @ 2.72 =	1523
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					2475

56

-- -J 40 C3

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

ATTR. PRC 24 10-26 BLDG. 3

1. DEPRECIATION .960

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	(1944 / from 1962)	F/19	25	48	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY
Mun	1-26-62	19911	6700	Pour Conf.

3. ADD'L L IMPVTS.

Paved Areas ☐ Walkways ____
Ret. Walls ☐ Sprinklers ____
Lawn-Ldsc. ☐ Fences ____

REMARKS ____

CARD ~~25~~ 23 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 (09)

4.

5. ADDRESS WHITMORE

6. CODE F B - -

7. USE
COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969	CF.	YR. 1970
	4674	487	22762		13928		14708		14548		14659		15128
		Add'l.	2680										
			25442		1971		1972 - 1973		1973 - 1974		1974 - 1975		1975 - 1976
			x 1.08		15685	24	15735		15020		16726		18626
			27477										
		48%	13189		1976 - 1977		1977		78		1979		1980
					15964		15708		13813		13976		14088
					1981		1982		1983		1984		1984
					14976		16423		29562		29256		32503
					1986		1987		54				
					31190		30840		29606				

57

NJ-J403

DESCRIPTION OF IMPROVEMENTS

CARD 2/3 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 09

SURVEY BY C. Young

DATE 7/21/64

9. USE TYPE
STORE ☐ OFFICE ☑
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐

15. CEILING
CANEC ☑ PLASTER ☐
PINE ☐ PLY BD ☐
CEILING HEIGHT 8'

16. ROOF STRUCTURE
WOOD ☑
STEEL ☐
CONCRETE ☐

17. ROOF DESIGN
GABLE ☐ SHED ☐
HIP ☑
GAMB ☐

18. ROOFING
METAL ☐ CONC. ☐
COMP. ☑ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☑
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☐

Office Bldg.
24 x 26 = 624
30 x 135 = 4050
4674 sq ft

Lanais
8 x 100 = 800
8 x 97 = 776
1576 sq ft

Field Sketch

11. UNITS AND ROOMS
NO. OF STORIES 1 HEIGHT 10 FT.
NO. OF UNITS
NO. OF ROOMS

12. FOUNDATION
FOOTING: CONCRETE ☐ MASONRY ☐
WALLS: CONCRETE ☐ MASONRY ☐
PIERS: WOOD ☑ CONCRETE ☐

13. FLOORS
STRUCTURE: WOOD JOIST ☑ CONCRETE JOIST ☐ STEEL JOIST ☐ CONCRETE SLAB ☐ CONCRETE PILES ☐
FLOORING: PINE ☑ CONCRETE (Bal.) ☑ CERAMIC TILE ☐ ASPHALT ☐

14. EXTERIOR WALLS
STRUCTURE: REINF. CONCRETE ☐ CONCRETE TILE ☐ STONE/ROCKS ☐ STEEL/METAL ☐ WOOD 1x6 ☑
EXT. FINISH: PLASTER ☐ FACE BRICKS ☐ STONE ☐ METAL ☐ PARTY WALL ☐
GLASS/VITROLITE OR
STORE FRONT L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☑ AMP ☐
FIXTURES CH ☐ MED ☑ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER ____ %
AVERAGE (NOR. DEP) ☐
BELOW AVER ____ %

25. CLASSIFICATION
CLASS Comm W S/CI 2
BY C.Y. 13 V

19. INTERIOR FINISH
STRUCTURE TYPE P/C FINISH MAT.
PARTITIONS: MICARTA
GLAZED WINDOWS SET IN WOOD ☐ METAL ☐

20. MILLWORK
WINDOWS: WOOD ☑ METAL ☐
DOORS: WOOD ☑ METAL ☐
TRIM: WOOD ☐ METAL ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET		2		226
URINAL		1		121
BASIN		2		160
SH STALL				
SINK			2	250
SUB TOTAL — PLUMBING				757

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
Lanais 1957	1 unit	4 Sq	1 Sq	1576 sq ft L.22	= 1923
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					2680

58

W-J 40 C3

DEPARTMENTAL FORM P-27 51

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

CD 10 MOD 5 OK

ATTR. (28) VT PRC

1. DEPRECIATION .975						2. BLDG. PERMIT RECORD					3. ADD'L IMPVTS.	CARD ZONE	SEC.	PLAT	OF CARDS PARCEL
B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %	PUR.	DATE	PER. NO.	AMOUNT	BP BY	Paved Areas ☐ Walkways ☐	4.	7	1	02	04 (09)
	1963	14	40	100		Add'n	12/01/62	202852	68700	Dove Corp.	Ret. Walls ☐ Sprinklers ☐					
											Lawn-Ldsc. ☐ Fences ☐	5. (WHITMORE) ADDRESS				
											REMARKS 253 x 116 = 2.93 c.f.	6. CODE 5				
												7. USE COM'L ☐ AGR. ☐ IND. ☐ INST. ☐				

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1964	CF.	YR. 1965	CF.	YR. 1966	CF.	YR. 1967	CF.	YR. 1968	CF.	YR. 1969
	10508	2.93	30788		32750		35124		37670		37820		38778
		Add.	314		1970		1971		1972 - 1973		1973 - 1974		1974 - 1975
			31102		40592		42743	25	43550		42222		47752
		(100%)	x 1.08		1975 - 1976		1976 - 1977		77		78		39.3
			33590		54004		46290		49827		46107		58795
					1980		1981		1982		1983		1984
					58586		58263		65227		115073		113991
					1985		1986		1987		86		
					126034		129027		129575		130186		

C-J60 C

DESCRIPTION OF IMPROVEMENTS

CARD 1 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04 (09)

SURVEY BY C. YOUNG

DATE 9/30/63

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
PELLET STORAGE WAREHOUSE

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☑ (BUTLER TYPE)

11. UNITS AND ROOMS
NO. OF STORIES 1 HEIGHT AVR. 26 FT.
NO. OF UNITS 1
NO. OF ROOMS 2

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☑	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐

13. FLOORS

STRUCTURE	FLOORING
WOOD JOIST ☐	PINE ☐
CONCRETE JOIST ☐	CONCRETE ☑
STEEL JOIST ☐	CERAMIC TILE ☐
CONCRETE SLAB ☑	ASPHALT ☐
CONCRETE PILES ☐	

14. EXTERIOR WALLS

STRUCTURE	EXT. FINISH
REINF. CONCRETE ☐	PLASTER ☐
CONCRETE TILE ☐	FACE BRICKS ☐
STONE/ROCKS ☐	STONE ☐
STEEL/METAL ☑	METAL ☑
WOOD ☐	
	PARTY WALL ☐

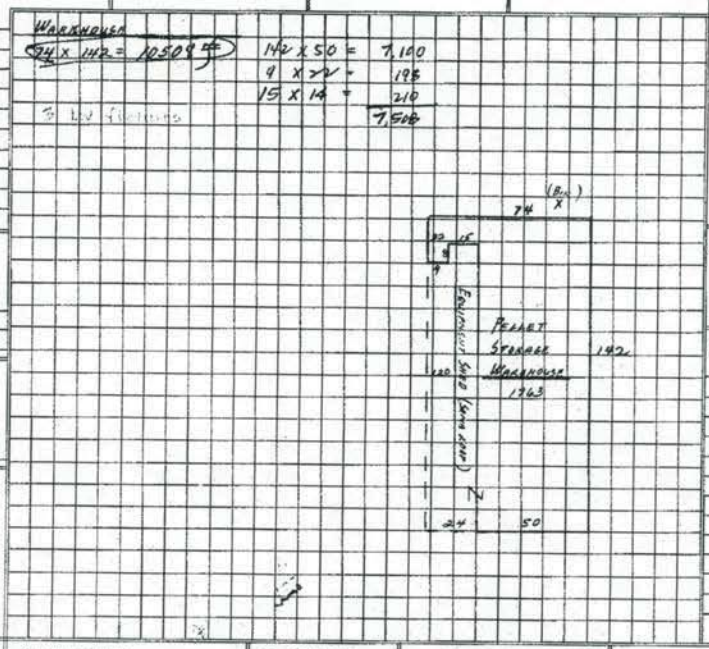
GLASS/VITROLITE OR ____
STORE FRONT ____ L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT ____

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
PLAIN
CEILING HEIGHT 16'

16. ROOF STRUCTURE
WOOD ☐
STEEL ☑ (BEAM)
CONCRETE ☐

17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐



19. INTERIOR FINISH
STRUCTURE FINISH
TYPE ____ MAT. ____
PARTITIONS: METAL
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☑	WOOD ☐
METAL ☑	METAL ☐	METAL ☐

26. PLUMBING

ITEM	CH.	MEO	GD	VAL
TOILET		1		113
URINAL		1		121
BASIN		1		80
SH STALL				
SINK				
SUB TOTAL – PLUMBING				314

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS

24. CONDITION
BETTER THAN AVER ____ %
AVERAGE (NOR. DEP) ☑
BELOW AVER ____ %

25. CLASSIFICATION
CLASS S/Z (UNSP/METAL) S/CI
BY C.Y. 347

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
TOTAL ITEMS 26 & 27					314

60

DEPARTMENTAL FORM P 17

DEPARTMENT OF TAXATION

RESIDENTIAL APPRAISAL CARD

CO-13 PP

CARD 27 OF 30 CARDS

1. DEPRECIATION .950						2. BLDG. PERMIT RECORD				
B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% CD.	ADJ. %	PUR.	DATE	PER. NO.	AMOUNT	BP BY
	1973	N	20	100		N	6-21-76	121262	28,100	Dale Co.

3. ADD'L L. IMPVTS

PAVED AREAS ☐ TERR/PATIOS ____ SQ. FT.
RET. WALL ☐ FENCES ____ LIN. FT.
LAWN-LDSC ☐ BARBEC. ____ CU. FT.
WALK WAYS ☐ SWIM. POOL ____ SQ. FT.
SPRINKLERS ☐ SHAPE ____ AV. DEPTH ____

REMARKS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04

4. (ZONE / SEC. / PLAT / PARCEL)

5. ADDRESS Whitmore

6. CODE 5 -

7. USE

RES. ☐ ACR. ☐
COM'L ☐ INST. ☐
IND. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1973 - 1974	CF.	YR. 1974 - 1975	CF.	1975 - 1976	CF.	1976 - 1977	CF.	YR. 77	CF.	YR. 78
			4536		6069		6689		5737		5582		5855
			1214		1919		1980		1981		1982		1983
			5,507		5867		5847		6111		6676		11892
			[illegible]		1985		1986		1987		58		
			11873		12790		12754		12485		12217		

DESCRIPTION OF IMPROVEMENTS

CARD 12 OF _____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04

SURVEY BY LY

DATE 12/12/72

9. USE TYPE & OCC.

	RENT.	HOME
1-FAM.	☐	☐
2-FAM.	☐	☐
APART.	☐	☐
MULTI.	☐	☐

10. UNITS & ROOMS

LIV. UNITS _____

ROOMS _____

STORIES _____

BASEMENT _____

11. FOUND. & STEPS

	FD.	ST.
CONC.	☐	☐
H.T.	☐	☐
STONE	☐	☐
WD. P.	☐	☐
H.O.G.	___	___

12. FRAME

WD-SW ☐ SWDB ☐ DW ☐

MASONRY ☐

STEEL ☐

REIN. CONC. ☐

13. EXTERIOR WALLS

T & G _____

B & B _____

RUSTIC _____

BRICK _____

STONE/ROCK _____

HT _____

PLAS/STUCCO _____

14. ROOF DESIGN

GABLE ☐ HIP ☐

FLAT ☐ GAMB ☐

15. ROOF STRUCT.

WOOD _____

STEEL _____

CONC. _____

16. ROOFING

COMP. _____

BLT/UP _____

SHING. _____

SHAKES _____

METAL _____

TILE _____

RAIN GUTTERS ☐

17. FLR STRUCT.

WOOD JOISTS ☐

CONC. " ☐

STEEL " ☐

CONC. SLAB ☐

18. FLOORING

	LIV.	B/R	BTH	KIT.	OTHER
PINE					
HDWD.					
CEM.					
TILE					

19. ELECTRICAL

FIXT. CH ☐ M ☐ GD ☐

OUTL. S/ST ☐ ST ☐ VC ☐

BUILT/IN OVEN ☐ STOVE ☐

VENT ☐ D/WR ☐

20. INTER. WALLS

TYPE _____

MAT. _____

21. CEILING

CANEC ☐ PLAS ☐

PINE ☐ PLY ☐

22. BATHROOMS

1 ☐ 1½ ☐

2 ☐ 2½ ☐

3 ☐

GREEN HSE
120 x 42 = 5040 ft

120

GREEN HSE

42

1972

23. MILLWORK

WINDOWS-D/H	___	DOORS-PANEL	___
SL. CS.	___	SOLID	___
PICTURE	___	SLID'G	___
JALOUSIE	___	CUSTOM	___
TRIM-PINE	___	CABINETS	___
HARDWD	___	SHELVES	___
METAL	___	VANITY (NO.)	___

24. PLUMBING

ITEM	CH	MED	GD	VAL.
S-UNIT				
BATH TUB				
W.C.				
BASIN				
SH. STALL				
SINK				
LAUND.				
SUN HT.				
SUB TOTAL—PLUMBING				

27. ADD'L FLOOR DET.

2ND ☐ 3RD ☐ 4TH ☐

28. CONDITION

BETTER THAN EVER ___ %

AVERAGE (NOR. DEP) ☐

BELOW AVER ___ %

29. CLASSIFICATION

CLASS ___ S/CL ___

BY

26. REMARKS

SHAPE 199

25. ADD'L IMPVT DETAILS

ITEM	RF	WL	FL	AREA	CF	VAL.
GREEN HSE	FIBER GLASS		DIRT	5040	.90	4536
				SUB TOTAL DETAILS		
				TOTAL ITEMS 24 & 25		4536

DEPARTMENTAL FORM P-17

DEPARTMENT OF TAXATION

RESIDENTIAL APPRAISAL CARD

CD.14

1. DEPRECIATION .950						2. BLDG. PERMIT RECORD					3. ADD'L L. IMPVTS	CARD 30 OF 30 CARDS
B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% CO.	ADJ. %	PUR.	DATE	PER. NO.	AMOUNT	BP BY	PAVED AREAS ☐ TERR/PATIOS PRR SQ. FT.	ZONE 7 SEC. 1 PLAT 02 PARCEL 04
	1973	N	80	100		N	6-28-72	121962	28,100	Dale Co.	RET. WALL ☐ FENCES CU. FT.	4.
											LAWN-LDSC ☐ BARBEC. CU. FT.	5. Whitmore ADDRESS
											WALK WAYS ☐ SWIM. POOL SQ. FT.	6. CODE 51
											SPRINKLERS ☐ SHAPE AV. DEPTH	7. USE
											REMARKS	RES. ☐ ACR. ☐ COM'L ☐ INST. ☐ IND. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1973 - 1974	CF.	YR. 1974 - 1975	CF.	YR. 1975 - 1976	CF.	YR. 1976 - 1977	CF.	YR. 77	CF.	YR. 78
			2306		3084		3399		2913		2836		2994
			1,214		1979		1980		1981		1982		1983
			2799		2978		2970		3104		3391		6040
			1984		1985		1986		1987		1988		
			6031		6497		6481		6342		6206		

DESCRIPTION OF IMPROVEMENTS

CARD 11 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04

SURVEY BY NJ

DATE 12/12/72

9. USE TYPE & OCC.

	RENT.	HOME
1-FAM.	☐	☐
2-FAM.	☐	☐
APART.	☐	☐
MULTI.	☐	☐

10. UNITS & ROOMS

LIV. UNITS ____

ROOMS ____

STORIES ____

BASEMENT ____

11. FOUND. & STEPS

	FD.	ST.
CONC.	☐	☐
H.T.	☐	☐
STONE	☐	☐
WO. P.	☐	☐
H.O.G.	____	____

12. FRAME

WD-SW ☐ SWDB ☐ DW ☐

MASONRY ☐

STEEL ☐

REIN. CONC. ☐

13. EXTERIOR WALLS

T & C ____

B & B ____

RUSTIC ____

BRICK ____

STONE/ROCK ____

HT ____

PLAS/STUCCO ____

14. ROOF DESIGN

CABLE ☐ HIP ☐

FLAT ☐ CAMB ☐

15. ROOF STRUCT.

WOOD ____

STEEL ____

CONC. ____

16. ROOFING

COMP. ____

BLT/UP ____

SHING ____

SHAKES ____

METAL ____

TILE ____

RAIN GUTTERS ☐

17. FLR STRUCT.

WOOD, JOISTS ☐

CONC. " ☐

STEEL " ☐

CONC. SLAB ☐

18. FLOORING

	LIV.	B/R	BTH	KIT.	OTHER
PINE					
HDWD					
CEM.					
TILE					

19. ELECTRICAL

FIXT. CH ☐ M ☐ GD ☐

OUTL. S/ST ☐ ST ☐ VG ☐

BUILT/IN OVEN ☐ STOVE ☐

VENT ☐ D/WR ☐

20. INTER. WALLS

TYPE ____

MAT. ____

21. CEILING

CANEC ☐ PLAS ☐

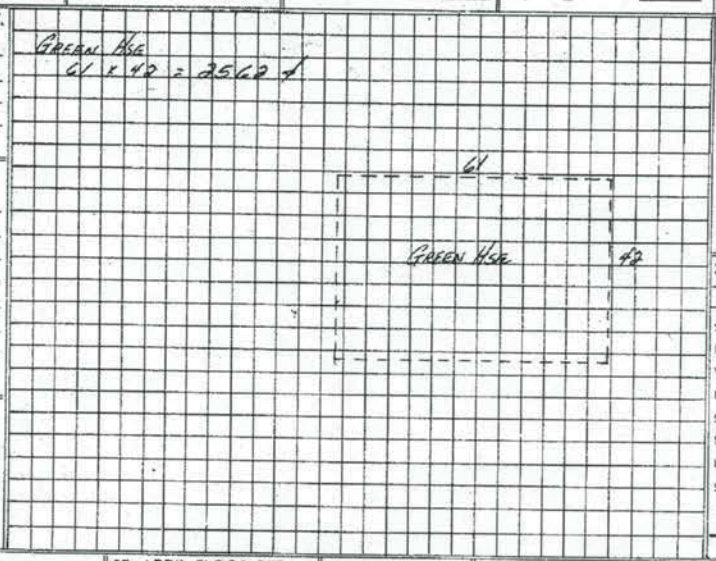
PINE ☐ PLY ☐

22. BATHROOMS

1 ☐ 1½ ☐

2 ☐ 2½ ☐

3 ☐ ____



23. MILLWORK

WINDOWS-D/H	____	DOORS-PANEL	____
SL. CS.	____	SOLID	____
PICTURE	____	SLIDG	____
JALOUSIE	____	CL'S IN	____
TRIM-PINE	____	CABINETS	____
HARDWD	____	SHELVES	____
METAL	____	VANITY-INC.	____

24. PLUMBING

ITEM	CH	MED	GD	VAL.
S-UNIT				
BATH TUB				
W.C.				
BASIN				
SH. STALL				
SINK				
LAUND.				
SUN HT.				
SUB TOTAL—PLUMBING				

27. ADD'L FLOOR DET.

2ND ☐ 3RD ☐ 4TH ☐

28. CONDITION

BETTER THAN EVER ____ %

AVERAGE (NOR. DEP) ☐

BELOW AVER ____ %

29. CLASSIFICATION

CLASS ____ S/CL ____

BY ____

26. REMARKS

SHAPE 199

25. ADD'L IMPVT DETAILS

ITEM	RF	WL	FL	AREA	CF	VAL.
GREEN HSE	Fiber Glass		Dirt	2562 ft	.90	2306
					SUB TOTAL DETAILS	
					TOTAL ITEMS 24 & 25	2306

DEPARTMENTAL FORM P-27

DEPARTMENT OF TAXATION

COMMERCIAL & INDUSTRIAL APPRAISAL CARD

PRC 0015 0066

1. DEPRECIATION 982

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ %
	For 85	N	55	100	

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY
Sto	8/28/84	191386	65,000	Dole Co

3. ADD'L IMPVTS.

Paved Areas ☐ Walkways ____
Ret. Walls ☐ Sprinklers ____
Lawn-Ldsc. ☐ Fences ____

REMARKS SEE SHEET FOR BC: NEW BLDG PAU WINDOW TRIM

CARD 29 OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
4. 7	1	02	04

5. 850 Whitmore Ave. (ADDRESS)

6. CODE 500

7. USE

COM'L ☐ AGR. ☐
IND. ☐ INST. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1985	CF.	YR. 1986	CF.	YR. 1987	CF.	YR. 88	CF.	YR.	CF.	YR.
	6500	20.62	128826		146391		148069		149766				
		1.102											
		345	141976										

-- 0040 C3

DESCRIPTION OF IMPROVEMENTS

CARD 1 OF 1 CARDS

ZONE	SEC.	PLAT	PARCEL
7	1	02	04

SURVEY BY

DATE

9. USE TYPE
STORE ☐ OFFICE ☐
LOFT ☐ BANK ☐
SERV. STA. ☐ THEATRE ☐
MISC

15. CEILING
CANEC ☐ PLASTER ☐
PINE ☐ PLY BD ☐
CEILING HEIGHT

16. ROOF STRUCTURE
WOOD ☐
STEEL ☑
CONCRETE ☐

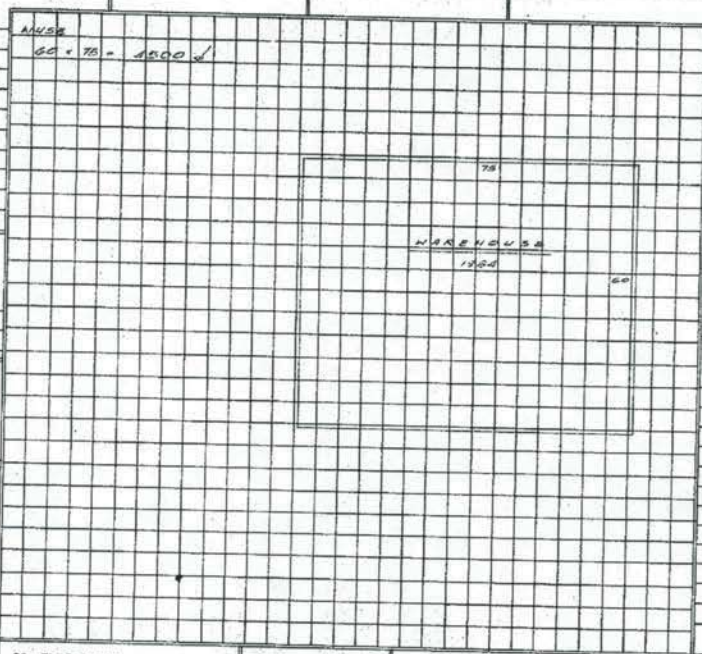
17. ROOF DESIGN
GABLE ☑ SHED ☐
HIP ☐
GAMB ☐

18. ROOFING
METAL ☑ CONC. ☐
COMP. ☐ TILE ☐
BUILT-UP ☐

10. CONSTRUCTION
WOOD FRAME ☐
MASONRY FRAME ☐
CONCRETE FRAME ☐
STEEL FRAME ☑

18'-EAVE HT

MISC
60 x 76 = 4560 #



19. INTERIOR FINISH
STRUCTURE FINISH
TYPE MAT.
PARTITIONS:
GLAZED WINDOWS
SET IN WOOD ☐ METAL ☐

11. UNITS AND ROOMS
NO. OF STORIES HEIGHT FT.
NO. OF UNITS
NO. OF ROOMS

20. MILLWORK

WINDOWS	DOORS	TRIM
WOOD ☐	WOOD ☐	WOOD ☐
METAL ☐	METAL ☐	METAL ☐

12. FOUNDATION

FOOTING	WALLS	PIERS
CONCRETE ☑	CONCRETE ☐	WOOD ☐
MASONRY ☐	MASONRY ☐	CONCRETE ☐

26. PLUMBING

ITEM	CH.	MED	GD	VAL
TOILET				
URINAL				
BASIN				
SH STALL				
SINK				
SUB TOTAL — PLUMBING				

13. FLOORS

STRUCTURE	FLOORING
WOOD JOIST ☐	PINE ☐
CONCRETE JOIST ☐	CONCRETE ☑
STEEL JOIST ☐	CERAMIC TILE ☐
CONCRETE SLAB ☑	ASPHALT ☐
CONCRETE PILES ☐	

14. EXTERIOR WALLS

STRUCTURE	EXT. FINISH
REINF. CONCRETE ☐	PLASTER ☐
CONCRETE TILE ☐	FACE BRICKS ☐
STONE/ROCKS ☐	STONE ☐
STEEL/METAL ☑	METAL ☑
WOOD ☐	

PARTY WALL ☐
GLASS/VITROLITE OR
STORE FRONT L.F.
SET IN WOOD ☐ METAL ☐ HEIGHT

21. ELECTRICAL
OUTLETS: FEW ☐ STD ☐ AMP ☐
FIXTURES CH ☐ MED ☐ GD ☐

22. ADD'L FLOOR DET.
2nd ☐ 3rd ☐ 4th ☐

23. REMARKS
MISC. AREA: 27.63
x 1.00
29.63

24. CONDITION
BETTER THAN AVER %
AVERAGE (NOR. DEP) ☐
BELOW AVER %

25. CLASSIFICATION
CLASS MET / CONC S/C BAZ
BY

27. ADD'L IMPT DETAILS

ITEM	RF	WL	FL	AREA	VAL
SUB TOTAL DETAILS					
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7460/30

APPENDIX D
Cultural Impact Assessment



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A Cultural Impact Assessment for the Whitmore Village Agricultural Project

TMKs: (1) 7-1-002:009 and 004 (Por.)

Wahiawā Ahupua‘a
Wahiawā District
Island of O‘ahu



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ASM Project Number . 31070.00

A Cultural Impact Assessment for the Whitmore Village Agricultural Project

TMKs: (1) 7-1-002:009 and 004 (Por.)

Wahiawā Ahupua‘a
Wahiawā District
Island of O‘ahu

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1. INTRODUCTION

At the request of Mr. Vincent Shigekuni of PBR Hawaii & Associates, ASM affiliates (ASM) has prepared this Cultural Impact Assessment (CIA) as part of an Environmental Assessment (EA) in support of the proposed Whitmore Agricultural Project. The roughly 37-acre project area comprises Tax Map Key (TMK) parcel (1) 7-1-002:009 and a portion of TMK: (1) 7-1-002:004, located within Wahiawā Ahupuaʻa, Wahiawā District, Island of Oʻahu (Figures 1 and 2). Both parcels are owned by the Agribusiness Development Corporation (ADC) of Hawaiʻi, which plans to replace the now defunct sugar and pineapple industries with local diversified agriculture with the creation of a food hub in Whitmore Village called the Whitmore Agricultural Project (WAP).

The current report was prepared in support of an EA in compliance with Hawaiʻi Revised Statutes (HRS) Chapter 343, and in accordance with the Office of Environmental Quality Control (OEQC) *Guidelines for Assessing Cultural Impact*, adopted by the Environmental Council, State of Hawaiʻi, on November 19, 1997. As stated in Act 50, which was proposed and passed as Hawaiʻi State House of Representatives Bill No. 2895 and signed into law by the Governor on April 26, 2000, "environmental assessments . . . should identify and address effects on Hawaii's culture, and traditional and customary rights . . . native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the 'aloha spirit' in Hawaiʻi. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on governmental agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups."

The historical land use of the project area as well as a discussion of the Precontact cultural context within Wahiawā Ahupuaʻa and greater Wahiawā and Waialua districts is presented in the pages that follow. The consultation process is then described, and the results of consultation are presented, which is followed by a discussion of potential cultural impacts and the appropriate actions and strategies necessary to mitigate any potential impacts.

PROJECT AREA DESCRIPTION

The current project area is located in the Whitmore Village area, approximately 1.25 kilometers north of the town of Wahiawā (see Figure 1). The project area is bound to the north and east by Whitmore Avenue (State Route 804) and existing residential developments, to the west by a privately-owned commercial property, and to the south by an unnamed drainage of the north fork of Kaukonahua Stream (Figure 3). The project area is former pineapple plantation land, and is currently an industrial facility that includes warehouse, administrative, and maintenance buildings, many of which have fallen into disuse, along with paved and unpaved roads and parking lots. Current lessees on the property include agricultural suppliers, a tow yard, and a stone countertop factory, as well as administrative offices of the Dole Food Company.

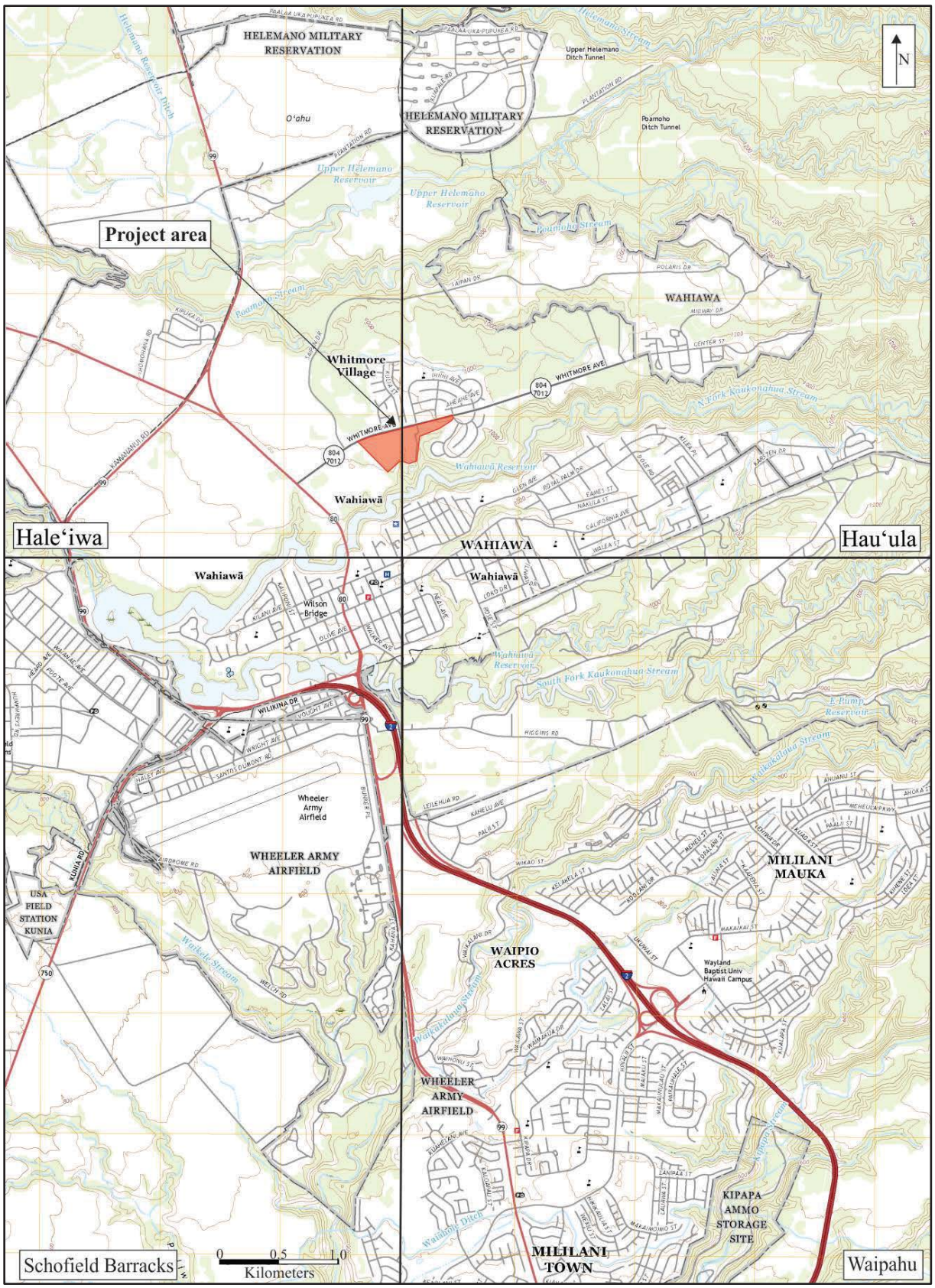


Figure 1. Project area location on composite of portions of four 7.5' Minute Series 2017 quadrangles.

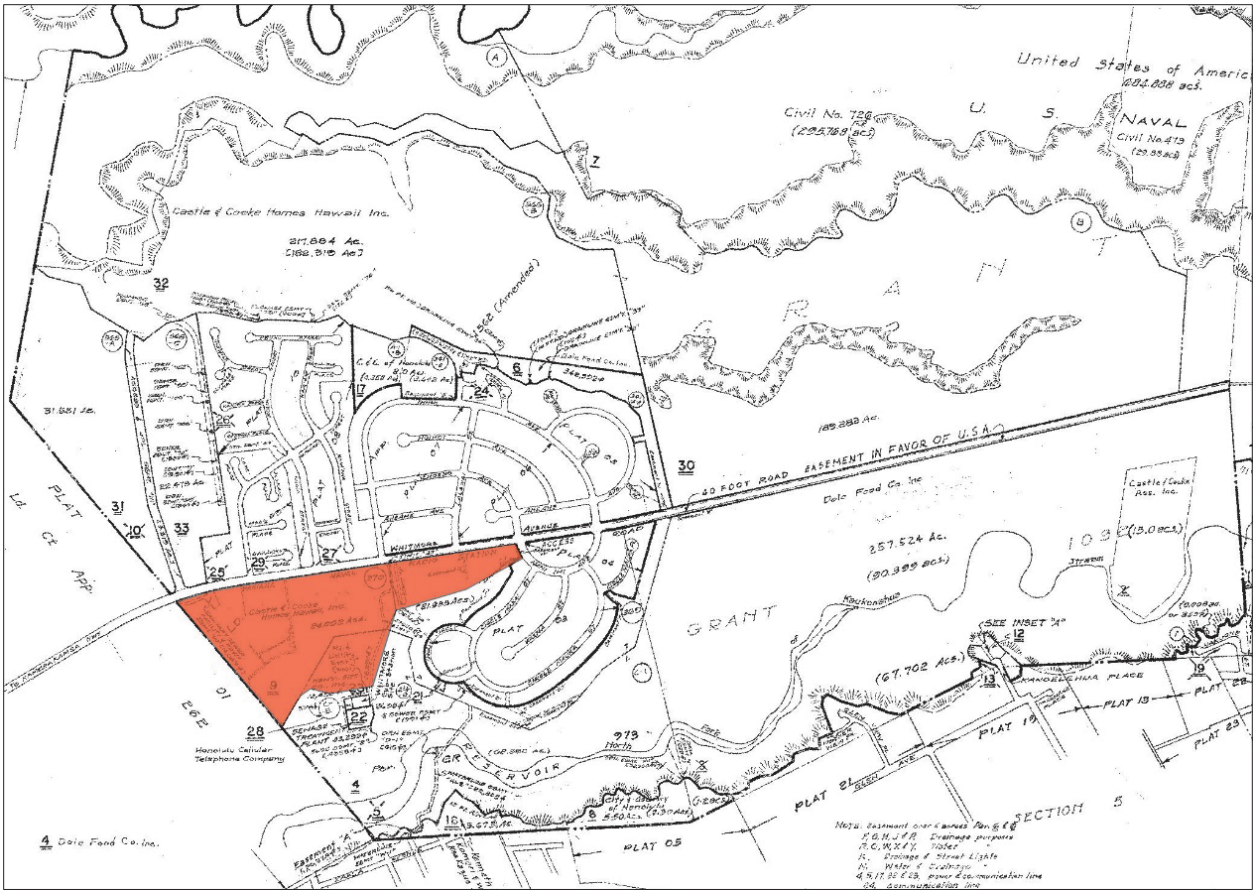


Figure 2. Portion of Tax Map Key (TMK) map (1) 7-1-002 showing project area location shaded red.



Figure 3. January 2013 satellite image showing location of current project area outlined in red.

PROPOSED DEVELOPMENT ACTIVITY

The objective of the WAP is to establish "a centralized food hub that empowers local farmers to sell their food to local consumers" thereby connecting producers and consumers along the food supply chain to enhance food security and meet Hawai'i Governor David Ige's commitment to double local food production by 2020 (UARC 2017:1). Since it was established in 1994, ADC has worked to help Hawai'i transition from commercial sugar and pineapple cultivation to diversified agriculture (ibid.). According to the Master Plan for the Whitmore Agricultural Project prepared in cooperation with ADC by contributors from the University of Arkansas Office for Sustainability, the University of Arkansas Community Design Center, and the University of Arkansas Resiliency Center (UARC), the main goals of ADC are as follows:

> 1) transitioning former plantation land and water systems for diversified agriculture; 2) Initiating development of facilities and providing support as necessary for successfully diversified agriculture; and 3) offering solutions to certain bottleneck issues facing the agriculture industry (State of Hawaii Department of Agriculture, 2017). . . Current projects include acquiring high-value agricultural land, forming subsidiaries to create partnerships, and educating farmers on various forms of agriculture. To further achieve these goals, the ADC has identified food hubs as a priority. (UARC 2017:1)

Components of the proposed development include farmland; a warehouse; affordable housing; and an Agricultural Hub that will consist of an agricultural-industrial park to include food safety, processing and packaging facilities, and office space (Figure 4).



Figure 4. Development plan for the Whitmore Agricultural Project.

2. CULTURE-HISTORICAL CONTEXT

The current project area falls within Wahiawā Ahupuaʻa (Figure 5). At different moments in time, Wahiawā was considered as part of the traditional district or *moku* of Waiʻanae, as well as Waialua, which combined comprise the central-western portion of Oʻahu and. However, since 1913 Wahiawā Ahupuaʻa has been considered part of Wahiawā District. Because the project area vicinity was predominantly associated with Waialua District during the Precontact and early Historic Period, prior to the establishment of Wahiawā District, the following discussion focuses on legendary and historical accounts pertaining to nearby land divisions of Waialua District; with an emphasis on Wahiawā District beginning in the late nineteenth and early twentieth century accounts.

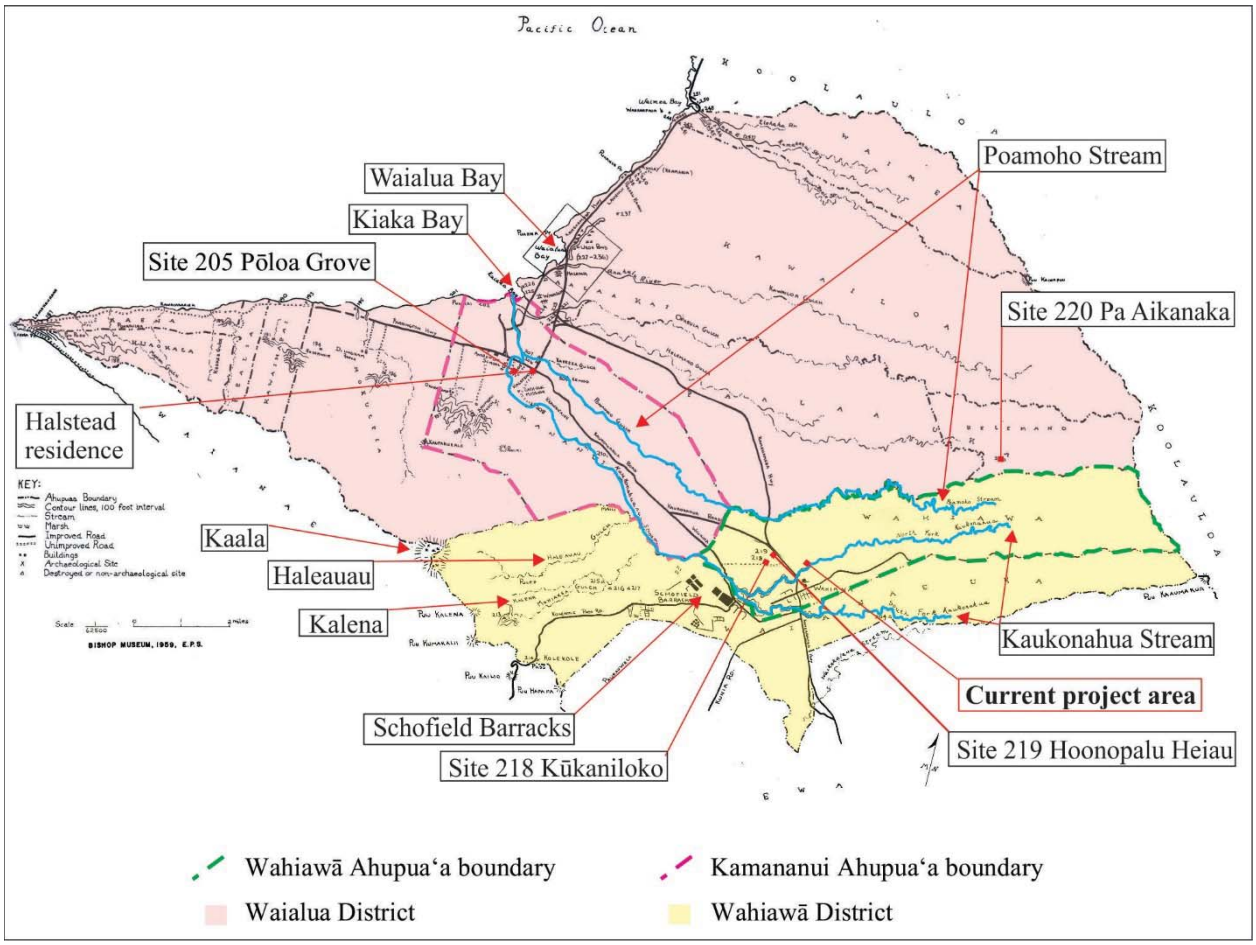


Figure 5. Annotated composite map from *Sites of Oahu* showing the project area within Wahiawā Ahupuaʻa, Wahiawā District, and relative to *wahi pana* discussed in the text (Sterling and Summers 1978:129 and 137).

The subject *ahupuaʻa* of Wahiawā is situated within the storied Leilehua Plain/Plateau between the Koʻolau and Waiʻanae mountain ranges (Pūkuʻi et al. 1974). According to Hawaiian Historian Samuel Kamakau, Waialua is known as the birthplace of the first Hawaiian chief: "Kapawa was the first chief to be set up as a ruling chief. This was at Waialua, Oahu; and from then on, the group of Hawaiian Islands became established as chief-ruled kingdoms" (1964:3). According to legend, Kapawa was born at Kūkaniloko, one of the most sacred places on Oʻahu (Fornander 1880; Thrum 1911) Over the twenty-five generations between Wakea and Kapawa, "the parents were masters over their own family groups" and Kamakau suggests that "perhaps because there were not many people, family quarrels did not grow up" (1964:3). However, over the generations hence, the Leilehua Plain/Plateau became known as a legendary training ground for warriors of Oʻahu in the art of *lua* fighting (Pūkuʻi et al. 1974:131), which is defined as:

> A type of dangerous hand-to-hand fighting in which the fighters broke bones, dislocated bones at the joints, and inflicted severe pain by pressing on nerve centers. There was much leaping, and (rarely) quick turns of spears. Many of the techniques were secret. . . Lua experts were bodyguards to chiefs. (Pūkuʻi and Elbert 1986:213)

In an entirely different context, the training of present-day warriors is carried out at nearby Schofield Barracks Military Reservation (Figure 5), located to the west of the current project area.

Sahlins (1992) states that *moku* characteristically comprised centrally located richer lands with ecologically marginal land along the periphery. In the case of Waialua Moku, the fertile lands of the neighboring *ahupuaʻa* of Paʻalaʻa and Kamananui, along with Kawailoa comprised the ecological center of Waialua Moku, which is eloquently described by Sahlins as follows:

> Geographically this heartland of Waialua consisted of the area around the neighboring bays—they are about a mile apart—of Kaiaka and Waialua. Into these bays, from their origins in narrow gorges deep in the mountains flowed four major streams. Dense settlements of people and large complexes of irrigated taro fields were situated on the floodplains of these streams. At Kamananui, the lowland fields were watered by means of a ditch some two miles long, the longest such waterway on Oʻahu (McAllister 1933:133; Handy and Handy 1972:466). Irrigation on a smaller scale extended for a considerable distance up the river valleys, while rainfall agriculture was practiced on the adjoining slopes, upland plains (*kula*), and forest clearings in the higher gulches. Around Waialua Bay were two large and famous brackish water fish ponds ʻUkoʻa and Lokoea. Fish were also raised in the many smaller ponds of the same area as well as in taro pondfields (*loʻi*). Given such intensive production, the core region must have supported the substantial majority of the Waialua population, which was probably on the order of 6,000 to 8,000 people just before the coming of the Haole. (1992:20)

It is within this general context that the following discussion of the history and culture of the project area is framed. The chronological summary presented below begins with a synthesis of Precontact settlement patterns and Historic land use that includes legendary and historical references to the greater Waialua District. The shifting of Wahiawā Ahupuaʻa from Waiʻanae District to Waialua District and ultimately to Wahiawā District, is also presented. The discussion concludes with a review of the findings from prior investigations conducted in the project area vicinity. Combined, this information provides a means for understanding the project area within the context of the greater cultural landscape.

EARLY HAWAIIAN SETTLEMENT PATTERNS

While the question of the timing of the first settlement of the islands of Hawaiʻi by Polynesians remains unanswered, several theories have been offered that derive from various sources of information (i.e., archaeological, genealogical, mythological, oral-historical, radiometric). However, none of these theories is today universally accepted because there is no archaeological evidence to support the proposed timing for the initial settlement, or colonization stage of island occupation. More recently, with advances in palynology and radiocarbon dating techniques, Kirch (2011) and others (Athens et al. 2014; Wilmshurst et al. 2011) have convincingly argued that Polynesians arrived much later in the Hawaiian Islands, sometime between A.D. 1000 and A.D. 1200 and expanded rapidly thereafter (c.f., Kirch 2011).

The initial settlement of the Hawaiian Islands is believed to have originated from the southern Marquesas Islands. In these early times, Hawaiʻi's inhabitants were primarily engaged in subsistence level agriculture and fishing (Handy et al. 1991). The Settlement Period was a time of great exploitation and environmental modification, when early Hawaiian farmers developed new subsistence strategies by adapting their familiar patterns and traditional tools to their new environment (Kirch 1985; Pogue 1978). Their ancient and ingrained philosophy of life tied them to their environment and kept order; which was further assured by the conical clan principle of genealogical seniority (Kirch 1984). According to Fornander (1969), the Hawaiians brought certain universal Polynesian customs and beliefs from their homeland, such as the major gods Kāne, Kū, and Lono; the *kapu* system of law and order; cities of refuge; the *ʻaumakua* concept; and the concept of *mana*.

Initial permanent settlements in the islands were established at sheltered bays with access to fresh water and deep-sea fisheries. The near shore fisheries and coastal fishponds, which were enriched by nutrients carried in the fresh water, also offered opportunities for resource extraction and stewardship. Communities shared extended familial relations and there was an occupational focus on the collection of marine resources. Clusters of houses were found in these coastal

areas where, over time, agricultural production first became established. Over a period of several centuries the areas with the richest natural resources became populated and perhaps even crowded, and inland elevations began to be used for agriculture and some habitation. Meanwhile, an increasing separation of the chiefly class from the common people began to emerge. As the environment reached its maximum carrying capacity, the result was social stress, hostility, and war between neighboring groups (Kirch 1985). Soon, large areas of the Hawaiian Islands were controlled by a few powerful chiefs.

As time passed, a uniquely Hawaiian culture developed. The portable artifacts found in archaeological sites from the Developmental Period reflect not only an evolution of traditional tools, but some distinctly Hawaiian inventions. The adze (*koʻi*) evolved from the typical Polynesian variations of plano-convex, trapezoidal, and reverse-triangular cross-section to a very standard Hawaiian rectangular quadrangular tanged adze. The two-piece fishhook and the octopus-lure breadloaf sinker are Hawaiian inventions of this period, as are *ʻulu maika* stones and *lei niho palaoa*. The latter was a status item worn by those of high rank, which indicates a trend toward greater status differentiation (Kirch 1985).

The next phase of early Hawaiian settlement known as the Expansion Period is characterized by major socioeconomic changes, intensive land modification, and the development of complex social hierarchies that arose as the population expanded (Kirch 1985). The building of monumental architecture, known as *heiau*, "played a key role as visual markers of chiefly dominance" as religion became more complex and embedded in a sociopolitical climate of territorial competition. M (Kirch 1990:206). By this time, most of the ecologically favorable zones of the windward and coastal regions of all major islands were settled and the more marginal leeward areas were being developed. The greatest population growth occurred during the Expansion Period when a second major migration settled in Hawaiʻi, this time from Tahiti in the Society Islands.

By the A.D. 1400s, the island of Oʻahu appears to have been divided into six traditional districts or *moku*. *Moku* were further divided into distinct land units known as *ahupuaʻa,* a concept which was established sometime during the A.D. 1400S, adding another component to a then well-stratified society (Kirch 1985). Around this time there was also a shift in residential patterns from seasonal, temporary occupation, to permanent dispersed occupation of both coastal and upland areas. *Ahupuaʻa* became the equivalent of a local community, with its own social, economic, and political significance. These land units were usually wedge or pie-shaped, incorporating all the eco-zones from the mountains to the sea and for several hundred yards beyond the shore, assuring a diverse subsistence resource base (Hommon 1986). This form of district subdividing was integral to Hawaiian life and was the product of strict resource management. In this system, the land provided fruits and vegetables and some meat for the diet, and the ocean provided a wealth of protein resources (Rechtman and Maly 2003). In communities with long-term royal residents there was a strict division of labor, with specialists in various occupations on land and in procurement of marine resources.

Ahupuaʻa were under the jurisdiction of *aliʻi ʻai ahupuaʻa* and managed by a *konohiki*. The *aliʻi ʻai ahupuaʻa* in turn answered to an *aliʻi ʻai moku,* a higher chief who ruled over the *moku* and claimed the abundance of the entire district. Thus, *ahupuaʻa* resources supported not only the *makaʻāinana* (commoners) and *ʻohana* (extended families) who lived on the land, but also provided support to the ruling class of higher chiefs and ultimately the crown. *Aliʻi* and *makaʻāinana* were not confined to the boundaries of an *ahupuaʻa*; when there was a perceived need, they also shared with their neighbor *ahupuaʻa ʻohana* (Hono-ko-hau 1974). *Ahupuaʻa* were further divided into smaller sections such as *ʻili, moʻoʻāina, paukūʻāina, kīhāpai, kōʻele, hakuone*, and *kuakua* (Hommon 1986, Pogue 1978).

As previously mentioned, the project area is currently located within Wahiawā District, but was formerly considered part of Waialua, which is one of the six traditional *moku* or (districts) that made up the Island of Oʻahu as recorded in the *Buke Māhele* (King 1935:214). According to Sahlins (1992), Waialua comprised six traditional *ahupuaʻa* (from west to east): Kaʻena, Kawaihapai, Mokulēiʻa, Kamananui, Paʻalaʻa, and Kawailoa. However, some historical and modern maps and sources list as many as fourteen *ahupuaʻa* within Waialua District. For example, the neighboring *ahupuaʻa* of Kamananui appears as "Mananui" on an 1833 map, reproduced as Figure 6 below, clearly situated within Waialua Moku along with the following *ahupuaʻa* (from West to East): Kaʻena, Keālia, Kawaihapai, Mokulēiʻa, Kamananui, Paʻalaʻa, and Kawailoa as well as the following *ʻili*: Aukuʻu, Anahulu, ʻUkoʼa, Kukuilolo, Punanui, Kaʻaleae, and Kapaeloa. Each of these land division names are depicted along the coast and along the various drainages; absolutely no place names are depicted within the *mauka* lands of Waialua on this early map. Also worth noting is that the Ahupuaʼa of Waimea appears clearly within Koʻolauloa District to the north of Waialua, rather than within Waialua District as it is today. Such discrepancies between land divisions from the early Historic Period with those of present-day are proof of the convoluted history of the subject *ahupuaʻa* and district.

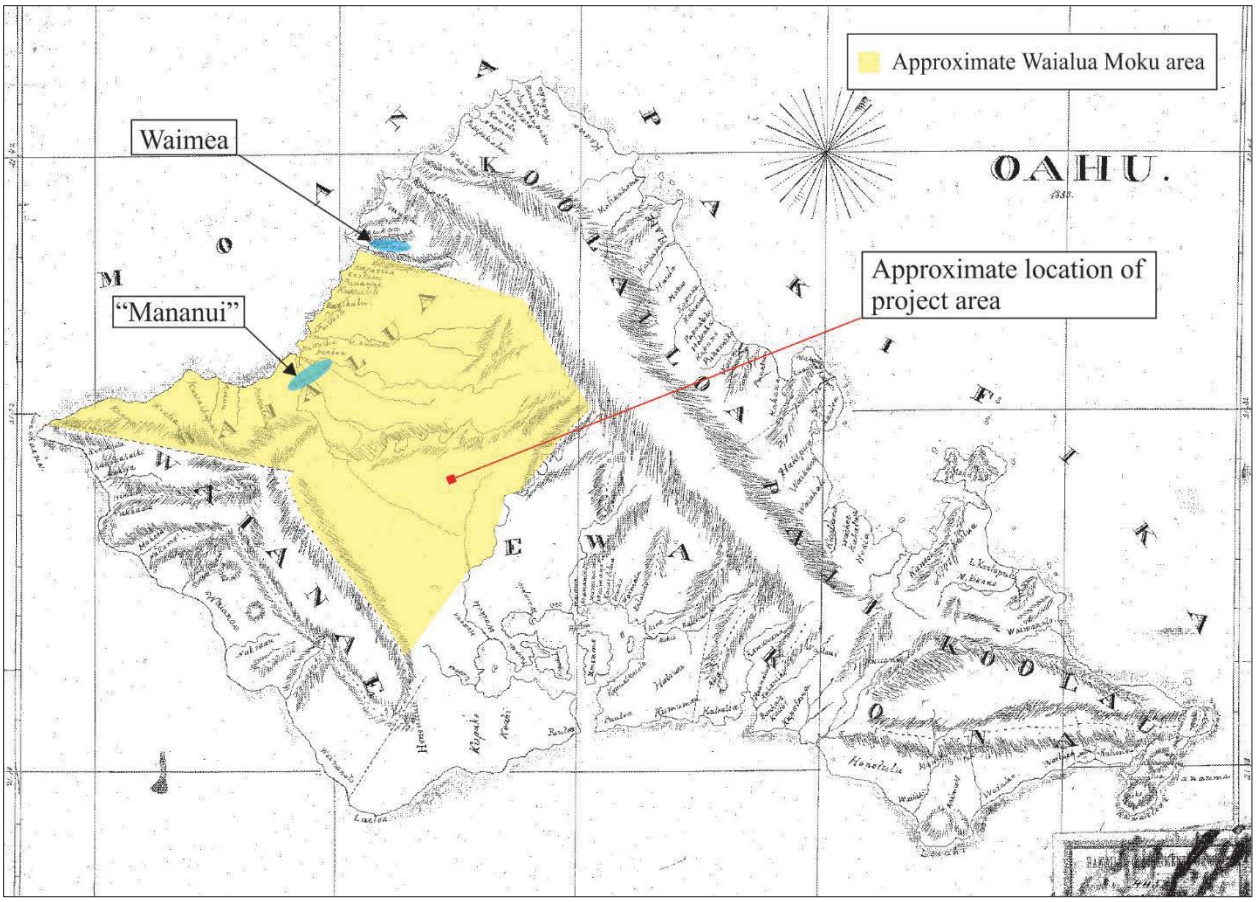


Figure 6. Hawaii Registered Map 455 showing the location of the project area within Waialua Moku ca. 1833.

The beginning of the complicated evolution of Waialua District can be traced to the Precontact Period—before the arrival of western explorers. According to Sahlins (1992) the chiefly system of Waialua District increased in complexity during the early years of the occupation of Oʻahu (ca. 1795) by the conquerors from Hawaiʻi Island. "At the conquest of Oʻahu, Waialua became the spoils of the powerful Hawaiʻi and Maui chief, the senior Keʻeaumoku" (Sahlins 1992:45); however, Keʻeaumoku "left Oʻahu with Kamehameha in 1796, shortly after the conquest, and as he died (of the *ōkuʻu*) in 1804 or shortly after the return, it is unlikely that Keʻeaumoku occupied himself directly with Waialua" (ibid.). His eldest child Kaʻahumanu "effectively controlled and heavily taxed Waialua for decades thereafter" (ibid.). Kaʻahumanu along with her siblings, including Kahekili Keʻeaumoku also known as Governor George Cox, retained possession of Waialua District until 1866 and "also maintained de facto rule of the Hawaiian kingdom, at least until the 1850s" (ibid.). Sahlins further describes the chiefly system of Waialua during the first half of the nineteenth century with Kaʻahumanu as the "'owner of the house' (*mea hale*) and Cox the 'occupant of the house' (*noho hale*); she held the *mana* [power] of the land, he the *mālama (*care) of it" as follows:

> The tenure of Waialua by the Kaʻahumanu people was organized in a specific and customary way, an arrangement in all likelihood put into place soon after Keʻeaumoku's death in 1804, that would last until the Māhele of midcentury. Land rights of the group were organized by seniority in the early period, and the holdings so established thereafter tended to pass by direct inheritance. Beginning with Kaʻahumanu. . . the head of this family was the greater 'lord of the land' (*hakuʻāina*) in Waialua. . . except for a brief period, Kaʻahumanu did not actively concern herself with the land, its products, or the people, nor did she ever reside there. Instead Waialua formally devolved upon her junior siblings: first Keʻeaumoku the younger, alias George Cox, until his death in 1824; afterward, her younger sister Piʻia Namahana. These people maintained residences in Waialua and at least sometimes lived there. Interestingly, Kaʻahumanu appears in Waialua land accounts as successor to Cox and grantor to Piʻia, for the land reverted to her upon the demise of the first, and she then gave it to the second. (ibid.:45-46)

At the time that western explorers first made contact with Oʻahu, Kamananui "was the ritual and political center of Waialua" (Sahlins 1992:20). However, by the late 1820s, the political center of Waialua had shifted over to the Anahulu Valley in Kawailoa Ahupuaʻa; "corresponding to a change in the residence of the ruling chief, this political development entailed a redrawing of *ahupuaʻa* boundaries" (ibid.). Sahlins explains the subsequent re-assignation of Waialua lands and the lasting impact of the shift in the location of political power as follows:

> Until 1824, the two royal fish ponds of Lokoea and ʻUkoʻa, although spatially separated from Kamananui (by the intervening *ahupuaʻa* of Paʻalaʻa and Kawailoa), were nonetheless controlled directly from there, by stewards (*konohiki*) of Kamananui proper. Likewise the remote fishing community of Kapaeloa at the eastern border of Waialua: it was considered part of Kamananui until the late 1840s; the local people held their lands from and "under" a lesser chieftain of Kamananui. The ruling *ahupuaʻa* of Kamananui thus encompassed certain detached lands—which gave it privileged access to important piscine resources. However, in the early nineteenth century, when the Waialua chiefship gravitated to Kawailoa, these outlying sections were taken into the latter land. . .
>
> The historic shift in political domination from Kamananui to Kawailoa was paralleled by a transfer of the ceremonial center of the *moku*. In effect the Protestant mission of Waialua, founded in Kawailoa in 1832, usurped the ritual hegemony from the temples of human sacrifice (*poʻokanaka*) that not long before had sanctified the landscape of Kamananui. The *ahupuaʻa* of Kamananui was the site of two temples (*heiau*) of the royal or *luakini* class (cf. Valeri 1985). These *heiau* were probably presided over by an Oʻahu form of the god Kū, the god of conquests and human sacrifice specially associated with kingship (Sterling and Summers 1978:103-4; Thrum 1906a:47, 1906b:52; cf. Valeri 1985). The shift of dominance from Kamananui to Kawailoa corresponded to a change in *tabu* systems. (ibid.:20-21)

The continuation of the convoluted history of Waialua District is linked to "the advent of Hawaiʻi's legislative government, or from about 1846" (King 1935:214). Robert D. King, Principal Cadastral Engineer for the Survey Department of the Territory of Hawaiʻi, explained some of the reasons for the changing boundaries thusly:

> Some of these changes were made for political reasons and others for convenience, but the principal changes in boundaries were caused by movements in population reflecting new uses of the land areas. These new district boundaries did not always conform to the *ahupuaa* boundary and there are examples today of an *ahupuaa* being situated in more than one district where no such condition existed in ancient times. (1935:214)

King continues his discussion of our twentieth century understanding of ancient *moku* and their boundaries, a subject that will be revisited later in this chapter, as follows:

> In envisaging the ancient district and its boundaries we observe that in the era before the conquest of the islands it performed a definite function in the grouping of a series of *ahupuaas* comprising the domain of a district chieftain, and that during the reign of Kamehameha I, when he broke the power of the district chiefs by appointing his own governors of the principal islands, it formed a logical subdivision of government under the King's viceroy.
>
> With the coming of constitutional government it continued to perform a useful service for administrative purposes in defining the jurisdiction of peace officers, police magistrates, tax collectors, school agents and other local officers, and in the *Mahele of 1848* it was particularly valuable in designating the location of the thousands of *ahupuaas* and *ili ainas*, many of them, with similar names, included in that great division.
>
> Today [ca. 1935] its chief value is historical and in the study of Hawaiian land tenure, as the modern district has in so many instances paid little or no attention to the old district name or boundary. Even the importance of the modern district has waned in these days of rapid transportation and decentralized but closely knit county government, so that almost its only use today is a conveniently established block of land for the assessing of real property for taxation purposes. (ibid.:224)

LEGENDARY ACCOUNTS

Traditional *moʻolelo* were passed down orally through the generations and many tales focus on *wahi pana* or legendary places. Many myths and legends associated with *wahi pana* of greater Waialua District including Wahiawā have been recorded and are discussed below.

The Maiden of the Golden Cloud

In a legend titled "Ke-Ao-Mele-Mele, The Maid of the Golden Cloud" published in *Legends of Gods and Ghosts* by W.D. Westervelt (1915a: 116-151), Waialua is mentioned as "the home of the dragons" (1915a:149). According to the legend, Mo-o-inanea (self-reliant dragon) "cared for the first children of the gods" including Hina (ibid.:116-117). Mo-o-inanea took Hina and Ku's daughter Ke-ao-mele-mele or the Maiden of the Golden Cloud and raised her. She gave the beautiful young girl her magic powers and "made this child the heir of all the divine islands, therefore she was able to know what was being done everywhere" (ibid.:129). When Ke-ao-mele-mele married Kau-mai-liula, Kane sent for Mo-o-inanea to go to O'ahu, "she prepared large ocean-going canoes for the two families, but she and her people went in their magic boats" from their ancestral home to Oahu (ibid.:148). She told her kin "they would never return to these lands, but should find their future home in Hawaii" and "told all her kupua dragon family to come with her to the place where the gods had gone" (ibid.). As she left "The Hidden land of Kane" it was covered in black rainclouds (ibid.:149). "She landed on Western Oahu, at Waialua, so that place became the home of the dragons, and it was filled with the dragons from Waialua to Ewa. This was the coming of dragons to the Hawaiian Islands" (ibid.).

The Cannibal Chief of Waialua

Westervelt briefly mentions Waialua in another volume titled *Legends of Honolulu* regarding the legendary tale of Ke-alii-ai Kanaka (Aikanaka for short) or the chief eating men (1915b:189-203). Westervelt's is but one of the many versions of the cannibal chief legend and "tells of the sudden appearance on the island of Kauai, in the indefinite past, of a stranger chief from a foreign land, with a small band of followers" and proceeds thusly:

> The king of Kauai made them welcome. Feasts and games were enjoyed, then came the discovery that secret feasts of a horrible nature were eaten by the strangers. They were driven from the island. They crossed the channel to Oahu. They knew their reputation would soon follow them, so they went inland to the lofty range of the Waianae Mountains. Here they established their home, cultivated food and captured human victims, until finally driven out. Then they launched their boats and sailed away toward Kahiki, a foreign land. (Westervelt 1915b:193)

Westervelt also presents an alternate version of the cannibal chef legend in which "the Oahu chief, Ke-alii-ai Kanaka, lived some time about the middle of the eighteenth century, as nearly as can be estimated" (1915b:194). He goes on to recount:

> Up to the middle of the nineteenth century the accounts of "Chief Man-eater's" deeds and the accurate knowledge of his place of residence were quite fresh in the minds of old Hawaiians.
>
> It is still an undecided problem whether "Chief Man-eater" was a foreigner or an Hawaiian. . .
>
> It would seem best to accept the legend that [the] degenerate chief was a desperado and an outcast from the high chief family of Waialua, on the northwest coast of Oahu.
>
> Ke-alii-ai Kanaka was a powerful man. He is described as a champion boxer and wrestler. In some way he learned to love the taste of human flesh. When his awful appetite became known he was driven from his home. As he passed through the village the women who had been his playmates and companions fled from him. His former friends, the young warriors, called out "Man-eater! Man-eater!" and openly despised him. In bitter anger he called the few servants who would follow him, and fled to the royal Waianae Mountains. Driven from his kindred and friends, he buried himself and his brutal appetite in the mountain forests.
>
> It is possible that soon after this he visited the island Kauai, and there passed himself off as a chief from a foreign land. But "his hand was against every man" and therefore "every man's hand was against him." Finally he made his permanent home among the Waianae Mountains, in the range that borders Waialua. (ibid.:194-195)

Per Westervelt, the cannibal chief settled on the plateau called Halemanu, although he is most likely referring to Helemano, a land division located within Waialua to the southeast of the current project area, which is also often referred to as Halemano (see Figure 5). Westervelt refers to the cannibal chief as Kokoa and provides the following description of his chosen home surrounded by tall peaks and precipices so steep his lair was inaccessible:

> . . . It could be entered only along a narrow ridge. The pandanus drooped its long leaves and aerial rootlets along the edges. The uluhi, or tangle-fern, massed and matted itself into a thick disguise for the cannibals' secret paths through the valleys below. Native flowers bordered the paths and crowned the plateau, as if man's worst nature could never wither the appeal of things beautiful. A magnificent

> koa, or native mahogany, tree spread its protecting branches by the spot chosen by Kokoa for his grass house. Kukui-trees furnished their oily nuts for his torches. The ohia, or native apple, and the bread-fruit and wild sugar-cane gave generously of their wealth to the support of the cannibal band. They easily cultivated taro, the universal native food, and captured birds and sometimes unwary hunters who penetrated the forest recesses in search of the birds with the rare yellow feathers. It was a beautiful den into which, spider-like, he dragged his victims.
>
> . . . As they entered the valley below the plateau, one of his followers said to another: "Our chief has found a true hiding-place for us. Let us hope that it may not prove a trap. If our presence here should be known to the people of Waialua, they could easily close the entrance to this valley with a strong guard and drive us against the steep walls up which we cannot climb.". . .
>
> . . . From this place raids could be easily made upon the surrounding country. To this place they brought their captives for their inhuman feasts.
>
> After the grass houses were built for permanent shelter, Kokoa, or "Ke-alii-ai Kanaka," caused a great hole to be made. This was the imu, or oven, in which the bodies of animals and men were to be baked. . .
>
> After a time Kokoa and his companions took a huge outcropping block of lava and smoothed away the top, making a hollow ipukai, or table dish. . . upon which their ghastly repasts were served. This stone table was finally rounded and its sides ornamented by rudely carved figures. This stone was five or six feet in circumference. . .
>
> One day he captured and killed a victim whom he carried through the forest Halemanu.
>
> A brother of this victim discovered and followed him to the path along the ridge. He recognized the chief who had been driven long before from Waialua. He knew the reputation for boxing and wrestling which belonged to his former leader. He went back to his village. For a year Hoahanau gave himself up to athletic training. He sought the strong men—the boxers and wrestlers of Waialua. . . . He covered his lithe and sinewy body with oil, that his enemy might not easily grasp an arm or limb. . . (ibid.:196-200)

Hoahanau found Aikanaka armed and challenged him to a wrestling bout without weapons. The young man was able to best Aikanaka, "caught him, and whirled him over the edge of the plateau. Down the chief swept, broken and mangled by the rough, sharp spurs of lava rock, until the lifeless body lodged in the branches of a tall ohia-tree far below" (ibid.:201-202). Thus, "this was the beginning and ending of cannibalism in the Hawaiian Islands so far as history and definite legend are concerned" (ibid.:202). In 1822, Gilbert Mathison visited the cannibal chief's former abode in Helemano; his account is presented in a forthcoming section on historical accounts of the project area vicinity.

Dishonorable Chief Waia

The gruesome nature of Aikanaka's misdeeds hold similarities with those of another chief associated with Waialua. Waia, the son of Hinamanoulua'e (mother) and Haloa (father), a respected and devout *ali'i*, engaged in brutal acts of torture against his own people after he took over his father's role as *ali'i*. The following synopsis is based on a Hawaiian Language newspaper installment of the series titled "*Moolelo Kahiko no Hawaii*" (Ancient History of Hawaii) written by J. M. Poepoe and published in *Ka Hoku o Hawaii* on April 16, 1929. Waia's kingdom was considered a dishonorable kingdom because he abandoned the righteous path and teachings of his father in the pursuit of worldly pleasures and increased personal wealth (Poepoe 1929). Thus, he stopped seeking the things that were good for his people. Waia neglected prayer and did not seek the counsel of oracles. He had no warriors to defend his kingdom and never looked out for the welfare of the people. Waia would abuse beautiful men and women and torture them to death. For instance, if he saw a beautiful woman he would sever her legs at the calves and let her die; and if he saw people with beautiful tattoos he would have them cut off from them and let them bleed to death. Upon the deaths of these men and women, for Waia did not discriminate when he chose his victims, he would take their bones and fashion them into fish hooks or tips for the darts he used to shoot rats for sport (Poepoe 1929).

Waia's gruesome acts were recorded in several *mele* that were composed during the reign of Kuali'i. This oral historical record served as a means of not allowing people to forget his cruelty and to inspire resilience—never again would people allow an *ali'i* to rule them in such a way. Because of his wicked ways of managing his kingdom, his subjects conspired and drowned Waia, and beat him until he died; then they rolled up his body in a mat and put it on a canoe that they sent into the open ocean and let sink. Waia was married to Huhune and their son Hinanalo took over the kingdom after his father was killed (Poepoe 1929).

Waia is also mentioned in the story of Hi‘iaka as published in installments by *Ka Hoku o Hawaii* between September 18, 1924 and July 17, 1928 under the title “*He Mo‘olelo Ka‘ao no Hi‘iaka-i-ka-poli-o-Pele*” Waialua is described as water lands “*he aina wai*” along with Waimanalo and Waianae; however, Waialua was the land of Waia, son of Hāloa and Hinamanoulu‘ae “*O Waialua nae, oia no ka aina o Waia, ke keiki a Haloa me Hinamanouluae*” (*Ka Hoku o Hawaii* 1926:1c.6). According to Poepoe, the word “Waia” was considered “*pelapela*” (*Ka Hoku o Hawaii* 1929), “filthy, dirty, nasty, indecent, unclean, vulgar, lewd, obscene” (Pūku‘i and Elbert 1986:323). Because the Hawaiian word “*lua*” is used to represent the number two, people have interpreted the place name Waialua as doubly wicked in reference to Waia’s countless wicked deeds. Another possible interpretation of Waialua can be inferred from separating “Waia” and “lua” based on an alternate meaning of the word “*lua*,” that which refers to the art of *lua* fighting, which is defined at the beginning of this chapter. The gruesome acts carried out by Waia against his own people included torture, disfigurement, and dismemberment, much like *lua* fighting, which placed an emphasis on causing pain, and causing partially survivable trauma localized at the victims’ joints. Furthermore, men traveled to the Leilehua Plain from across the archipelago to learn this ancient fighting style. Thus, based on the regional/geographical association with *lua* fighting in the Waialua/Wahiawā area combined with the similarities between Waia’s heinous acts and *lua* fighting, the place name Waialua may refer to this correlation.

The Legend of Hi‘iaka

In the version of the legend of Hi‘iaka and her sister Pele as recorded by Nathaniel Emerson, Waialua is also mentioned although not in association with the despicable chief Waia. Rather, during their journey between the islands, Hi‘iaka stops at the summit of Kehuoha Pu‘u in Waialua and “describes the scene before her” including her view of Wahiawā (Emerson 1915:97) as follows:

> From the same vantage ground—that of Kehu-o-hapu‘u—Hiiaka not only saw the dash of the ocean against the buttresses of the near-by coast, her ears also were filled with a murmurous ocean-roar that gave to the air a tremor like that of a deep organ-tone:
>
> | | |
> |---|---|
> | O Wai-alua, kai leo nui: | Wai-alua, land of the sounding sea, |
> | Ua lono ka uka o Lihu‘e; | With audience in upland Lihu‘e— |
> | Ke wa la Wahi-awá, e. | A voice that reaches Wahi-awá: |
> | Kuli wale, kuli wale I ka leo; | Our ears ae stunned by this voice— |
> | He leo no ke kai, e. | The voice, I say, of old Ocean! |
>
> The landscape still held her and she continued:
>
> | | |
> |---|---|
> | O Wai-alua, la‘i ehá, e! | Wai-alua has a fourfold calm, |
> | Ehá ka malino lalo o Wai-alua. (ibid.:99) | That enfolds and broods o’er the land. |

The Legend of Halemano

The *wahi pana* of Wahiawā and Kūkaniloko (which will be discussed in further detail in the next section), located near the project area, are also mentioned in the tale of the legendary romance between Halemano of O‘ahu and the beautiful and forbidden princess Kamalalawalu (Kama) of Puna, Hawai‘i as the father and mother of the male protagonist (Fornander 1918-1919:228). In footnotes, Fornander further defines Wahiawā and Kūkaniloko thusly,

> These persons’ names are those of well-known localities in the Waialua district of Oahu, eastward of the Leilehua plain, at the base of the Waianae range.
>
> Kukaniloko was the name of the place set apart from the time of Kapawa as sacred, having special powers or virtues as the birthplace of the highest *kapu* chiefs. (ibid.)

The following synopsis is based on the version of this romance published under the title “Legend of Halemano” in *Fornander Collection of Hawaiian Antiquities and Folk-Lore Volume V* (Fornander 1918-1919:228-262), and Halemano was the youngest of six children and embodied physical perfection. Kama lived under a strict *kapu* (taboo) that kept her from leaving her home or having visitors, and her parents had promised her as the wife of either the Hilo or the Puna King upon reaching maturity. Visions of Kama appeared to Halemano in his sleep and he fell in love with the image of her without knowing her name; driven by his obsession with Kama, Halemano starved himself to death but was brought back to life by his sister, Laenihi, a shape-shifting sorceress. Shortly afterwards, Laenihi went to Hawai‘i to find Kama and upon her return told Halemano that he “must make some playthings for the favorite brother

of Kamalalawalu, Kumukahi by name; because I have seen that whatever things he desires his sister would always do; she will deny nothing that her brother requests of her" (ibid.:234). Subsequently,

> Laenihi then instructed the people from Waialua to Waianae that wooden idols be hewed out and that they be painted red and black. Orders were also issued that wooden chickens be made to ride on the surf, also *koieie* floaters, and kites to fly above; also that a red canoe be prepared and red men be had to paddle the canoe. The men should be provided with red paddles and the canoe must be rigged with red cords, and that a large and a small canoe be provided. (ibid.)

The color red indicates "a chief's distinction" (ibid.) and once the objects were made, Laenihi and Halemano set forth to Puna. As they expected, Kumukahi was impressed by the gifts and was able to convince his sister Kama to board one of the canoes; and she was carried off with Halemano to ʻUkoʻa at Waialua. The two lovers were soon married and living simply and happily until Aikanaka, the king of Oʻahu, ordered that Halemano be killed on sight so that he could have Kama for himself. As a result, the couple were forced to flee across Oʻahu and then to Molokaʻi, Maui, and Hawaiʻi, where she was taken by Kuaa, the king of Puna. After a time, they went on to live in Kohala for a time until Kama was unfaithful and became another man's wife, which drove Halemano to starve himself to death again. Once again, Laenihi revived him and against his families wishes, he sought to win his wife back. To that end, Halemano trained as a master chanter, assuming that she might return to him if he became something more than a farmer. Once he had learned the art of chant, he entered a competition where Kama was among the audience gathered to hear the performance. Halemano took the opportunity to compose a chant about the life they had shared together during the early days of their marriage on Oahu. Halemano's chant mentions Wahiawā and other places in Waialua District, the locations of some are depicted in Figure 5 above:

> I am cold and chilly,
> Let me lie in your bosom, love.
> We have roamed over Kalena in the uplands of Haleauau,
> In the cold thickets at Wahiawa.
> It was during the days of the heavy fog at Kaala,
> For the cold was brought forth by the dew
> Together with the fragrance of the kupukupu of Lihue.
> The false cold is uncovered at Waikoloa
> For my love was exposed by the tears,
> As we met at Kalena in Haleauau. (ibid.:250)

Thus, Halemano and Kama were reunited but remained together only a short while for Halemano's new love interest, Kikekaala, whisked him away from her and kept a close eye on him day and night. Eventually, Kama would be taken by the kings of Hawaii as their wife.

Kūkaniloko

As previously mentioned, Waialua is home of Kūkaniloko, the sacred birthplace of Hawaiian *aliʻi*. A description of the origin of Kūkaniloko and details regarding how the site was used as a royal birthplace appears in an article published in Hawaiian language newspaper *Ka Nupepa Kuokoa* in 1865 as part of the series titled "Ka Moʻōlelo o Hawaii Nei," as follows:

> **Na Wahi Hanau Alii (The Birthplaces of Chiefs)**
>
> There are two places that have been reserved for the chiefs, and there are signs that informs the type of high chief and lesser chiefs. Kūkaniloko at Waialua, Oʻahu. Holoholokū at Wailua, Kauaʻi.
>
> **No Kukaniloko (Regarding Kukaniloko)**
>
> Kukaniloko was made by Nanakaoko and his wife Kahihiokalani as the birthplace for their son, Kapawa.
>
> A row of stones was laid down on the right hand and another on the left hand, and the face was to the right side. There sat thirty-six chiefs, and a hunchback from the uplands. Kukaniloko was the stone to be trusted. If any one came in, and with trust and lay the thighs properly upon the supports Liloekapu, and the child born face up. It would be called a chief, a god, a burning fire.
>
> When the child was born, it was quickly taken inside the waihau of Hoolonopahu; and within were forty-eight chiefs to whom belonged the duty of the birth ceremonies of cutting the navel cord.

> The south side of Kukaniloko was a furlong and a half, and on the western side two furlongs. There the tabu drum of Hawea was sounded, signifying the birth of a chief. On such occasions the common people assembled on the east side of the stream—a great many of them (a mano), on that side of Kuaikua. On the south side were the servants.
>
> But some of the chiefs were born outside [of Kukaniloko], and to those with a hunched back. They were indeed chiefs, some being born on the roads; chiefs indeed but were chiefs from outside.
>
> Kamehameha thought that Keopuolani would give birth in Kukaniloko. The ascent was made, but she did not give birth and returned.
>
> One chief of Maui went into Kukaniloko, Kaulahea, the man and Kapohanaupuni the woman. (*Ka Nupepa Kuokoa* August 5, 1865 Buke IV Helu 31:1)

Per Fornander, Nanakaokao and Kahihiokalani were acknowledged "by the oldest, and by all the legends" as having established Kūkaniloko (1880:20). At the time of his writing ca. 1879, the remains of Kūkaniloko were "still pointed out about three-fourths of a mile inland from the bridge now crossing the Kaukonahua stream" (ibid.). He goes on to say that the distinction and privileges conferred upon the *ali'i* born at Kūkaniloko were so sought after that despite the decayed state of the sacred site in the late eighteenth century, Kamehameha I had wanted Liholiho to be born there; however, Keopuolani was unable to travel there for their son's birth due to illness (ibid.).

In an article titled "Kukaniloko: Birthplace of Aliis," published in the *Hawaiian Almanac and Annual for 1912* (Thrum 1911:101-105), Thrum mentions the names of the following chiefs who were born at Kūkaniloko: Mailikukahi, Kalaimanuia, and Kakuhihewa. He also makes the following statement, "the tradition of its recognized eminent virtue has come down by various native authorities which traces it back to about the opening of the twelfth century" (Thrum 1911:102). At the time of his writing ca. 1911, Kūkaniloko appeared as follows:

> We look in vain today for the prominent boulder which in tradition, if not in fact held the magic power and marked the locality on the plains of Helemanu, and against which chiefesses of the highest rank were aligned to lie during childbirth. . . Instead, the searcher will find a scattered lot of large stones, most of which are deeply embedded in the earth, and several of which are flat surfaced, even with the ground. These are in an area of about one hundred square feet and within the past few years have been protected by a wire-fenced enclosure of perhaps twice the size, for preservation as the historic landmark that it is. Credit for this action is said to belong to Mr. W. W. Goodale, manager of the Waialua Agricultural Company.
>
> Amid a group of three or four of the most prominent of these stones is one standing, tongue-shaped, measuring a little over five feet in height by two and one-third feet in width, that has been supposed by many was the famous stone in question from its weather-worn condition, but an aged native familiar with the locality and its traditions, says, it was brought from elsewhere by the late George Galbraith and set up there. It is clearly a different quality of lava rock than predominates in the vicinity. Facing the stone, westward, is one of the largest, deeply imbedded in the ground, the upper surface of which has rudely-shaped depressions fitting the human form the primitive mind in ages past coupled with a cause and a purpose familiar to the savage idea, which subsequent generations, through superstition and tradition, have magnified. (Thrum 1911:102)

Martha Beckwith mentions the sacred birthing stones of Kūkaniloko in her background to the "Hawaiian Romance of Laiekawai," (Beckwith 1919:287-666), which recounts the wooing of a chiefess and her deification. Beckwith provides the Hawaiian language version of the legend as recorded by Haleole along with detailed supporting information and annotated translation of the text. Here is her description of Kūkaniloko ca. 1919:

> Kukaniloko in the uplands of Wahiawa [see Figure 5], where Laielohelohe is concealed by her foster father, is one of the most sacred places on Oahu. Its fame is coupled with that of Holoholoku in Wailua, Kauai, as one of the places set apart for the birthplace of chiefs. . . Situated as it is upon the breast of the bare uplands between the Koolau and Waianae Ranges, the place commands a view of surprising breadth and beauty. Though the stones have been removed, through the courtesy of the management of the Waialua plantation a fence still marks this site of ancient interest. (Beckwith 1919:339)

Wahiawā is also mentioned in the legend of the half-man/half-pig demi-god Kamapua'a as the locale to which he fled from Olopana. Per Beckwith's version, while in Wahiawā, he "loses his strength by eating food with the letters *lau*, but eventually becomes lord of Oahu" (1919:644).

WAHIAWĀ AFTER EUROPEAN CONTACT

The arrival of Western explorers in Hawai‘i signified the end of the Precontact Period ca. 1778, and the beginning of the Historic Period. With the arrival of foreigners such as British explorer Captain James Cook, in command of the ships *H.M.S. Resolution* and *H.M.S. Discovery*, Hawaiian culture and economy underwent drastic changes. Demographic trends during the late Precontact early Historic Periods indicate population reduction in some areas, due to war and disease, yet increase in others, with relatively little change in material culture. At first there was a continued trend toward craft and status specialization, intensification of agriculture, *ali‘i* controlled aquaculture, the establishment of upland residential sites, and the enhancement of traditional oral history (Kirch 1985; Kent 1983). The Kū cult, *luakini heiau*, and the *kapu* system were at their peaks, although western influence was already altering the cultural fabric of the Islands (Kirch 1985; Kent 1983). Foreigners very quickly introduced the concept of trade for profit, and by the time Kamehameha I had conquered O‘ahu, Maui and Moloka‘i, in 1795, Hawai‘i had seen the beginnings of a market system economy (Kent 1983). Some of the work of the commoners shifted from subsistence agriculture to the production of foods and goods that they could trade with early visitors. Introduced foods often grown for trade with Westerners included yams, coffee, melons, Irish potatoes, Indian corn, beans, figs, oranges, guavas, and grapes (Wilkes 1845). Later, as the Historic Period progressed, Kamehameha I died, the *kapu* system was abolished, Christianity established a firm foothold in the islands, and introduced diseases and global economic forces began to have a devastating impact on traditional life-ways in the Hawaiian Islands. This marked the end of an era of uniquely Hawaiian culture.

Early Historical Accounts of Waialua and Wahiawā (1779-1848)

Written accounts left by early visitors to the Island of O‘ahu, such as those presented below, offer valuable insight into what life may have been like for the earliest residents of Wahiawā and Waialua. Many of these historical accounts were penned by seafaring men who dropped anchor at or near what they refer to as Waialua Bay. However, according to Sahlins because Kamananui Ahupua‘a, which encompasses Kaiaka Bay “was the political center of the *moku* of Waialua, and the settlement there was thus known as Waialua, at least to Haole, as it still is” these unwitting visitors mistakenly called it Waialua Bay rather than Kaiaka Bay.

In late February of 1779, the remaining crew of Cook’s ship *Resolution* under the command of Captain Clerke and *Discovery* under the command of Captain James King sailed from Maui to O‘ahu and made an unsuccessful attempt to water the ship. King recorded the following observations:

> Between the north point [Kahuku] and a distant headland, which we saw to the south-west the land bends inward considerably, and appeared likely to afford a good road. . . At a quarter past two, the sight of a fine river, running through a deep valley, induced us to come to an anchor in thirteen fathoms water, with a sandy bottom [Kaiaka Bay]. . . In the afternoon, I attended the two captains on shore, where we found but few of the natives, and those mostly women; the men, they told us, were gone to Morotoi [Moloka‘i] to fight Tahyterree [Kahekili]; but that their chief Perreeoranee [Pele‘ioholani; *ali‘i nui* of O‘ahu], who had stayed behind, would certainly visit us, as soon as he heard of our arrival.
>
> We were much disappointed to find the water had a brackish taste for two hundred yards up the river, owing to the marshy ground through which it empties itself into the sea, Beyond this, it was perfectly fresh, and formed a fine running stream, along the side of which I walked, till I came to the conflux of two small rivulets, that branched off to the right and left of a remarkably steep and romantic mountain. The banks of this river, and indeed the whole we saw of the north-west part of Woahoo [O‘ahu] are well-cultivated, and full of villages; and the face of the country is uncommonly beautiful and picturesque. (1821:81-82)

In a later entry within the chapter that provides a “general account of the sandwich islands,” King made the following statement about the northern shores of O‘ahu:

> As far as we could judge, from the appearance of the north-east and north-west parts (for we saw nothing of the southern side), it is by far the finest island of the whole group. Nothing can exceed the verdure of the hills, the variety of wood and lawn, and rich cultivated valleys, which the whole face of the country displayed. (ibid.:106-107)

Discussions about such rich cultivated valleys were included in E.S. Handy's 1931 ethnographic study of traditional Hawaiian agricultural activities related to native plants, which were extant on the island prior to European contact (Handy 1940). In his chapter on Taro plantings in a section titled "Planting Localities" Handy mentions Wahiawā, and other nearby *ahupua'a* of Waialua:

> TARO. **Terraces:** high terracing in interior valleys rare; broad terraces in valley bottoms, on lower slopes, and in lowlands, irrigated from streams and springs from Waialae to Ewa, Waianae-kai and Waianae-uka. . . Kaena, Kawaihapai, Mokuleia to Waimea, Helemano, Wahiawa, and throughout Koolau. . . **Kula lands:** developed only where water could be diverted for irrigation as at Wahiawa; little if any dry taro planted. . . **Swamp Planting:**. . . Waialua and Paalaa. . . (1940:75)
>
> Upland *kula* were planted with sweet potatoes in Kamananui, Paalaa, Helemano, and Wahiawa, where the sweet potato was the main staple although some taro was grown. (ibid.156)

Handy also relates the following details about Kamananui Ahupua'a specifically, which mention the streams that demarcate the boundaries of Wahiawā, located near the current project area:

> **Kamananui.** Formerly there were large terrace areas along the flatlands between the junction of Helemano and Poamoho Streams and the flatland west of Poamoho. There were also small terrace areas up in the lower flats of Poamoho and Kaukonahua Valleys. There were small flats in the bottom of Kaukonahua Canyon for several miles above its junction with Manawai Stream. Poamoho is probably too narrow for taro terraces. It is likely that in these gulches, as at Waimea, sweet potatoes and bananas were planted around home sites along the ridge and near taro parches at the bottom of the gulch. Wild taro and bananas grow in Manawai Valley and presumably also in the other five valleys that run up towards Puu Kane. (1940:85-86)

Handy mentions Wahiawā in his discussion of land divisions within Ewa District rather than Waialua or Wahiawā District, for that matter. Handy contradicts an informant's claim that "there were numerous terraces on the level uplands in the vicinity of Wahiawa town, irrigated by a ditch bringing water from Helemano Stream" because it was "impossible, since Poamoho Stream intervenes" (ibid:81). He does however go on to say that extensive terraces irrigated by Wahiawā Stream extended nearly two miles inland, as well as "immediately above and below" Wahiawā Town (ibid.). In a later volume, Handy and his colleagues discuss Wahiawā as an "inland district" in his chapter titled "Areas of Habitation" (Handy et al. 1991:465). Handy et al. also suggest that the Wahiawā area must have supported a "sizable" Precontact Hawaiian population, based on the areas of *lo'i* and the extensive sweet-potato and yam plantations (ibid.:464).

In addition to taro, bananas, and sweet potato, sandalwood harvesting was carried out in Waialua during the late eighteenth and early nineteenth century. In November of 1815, when a Russian warship attempted to take over O'ahu Kamehameha called for people across the island to come to Honolulu and help build a fort to defend the island from invaders (Kamakau 1992). However, "the district chief of Waialua, Ka-hekili Ke'e-au-moku [George Cox] was so busy collecting sandalwood that his district alone failed to respond to the call" (Kamakau 1992:206). Kamakau goes on to say that after the fort was complete, "Ka-lani-moku and all the chiefs went to work cutting sandalwood at Wahiawa, Halemano, Pu'ukapu, Kanewai, and the two Ko'olau's" (ibid.:207). Apparently, "the largest trees were at Wahiawa, and it was hard work dragging them to the beach" (ibid.). Because of its lasting impact on the inhabitants, economy, and environment of the project area vicinity and across the Hawaiian Islands, a brief discussion of the sandalwood trade is presented in the following paragraph.

Before Europeans arrived in Hawai'i, the several species of sandalwood (*'iliahi*) were used in a limited way, primarily for medicinal applications, perfume, and firewood (Krauss 1993). Sometimes sandalwood was also used to make bows for the stringed mouth instrument called *'ukēke* (Buck 1964:388). In the early 1790s, a period of intense sandalwood exploitation and attendant social and environmental changes began when early foreign merchants began trading the fragrant wood with merchants in Canton (Cottrell 2002). A shortage in the supply of "white sandalwood" (*Santalum album*) from India and the East Indies, which was used to make ornate cabinets and chests, incense, perfumes, and medicines, caused European, American, and Cantonese traders to turn to Hawai'i and other sources (Merlin and VanRavenswaay 1990). The first shipment of *'iliahi* to Canton occurred sometime around 1790, and the earliest supplies of sandalwood to foreign merchants were controlled by the *ali'i* (Merlin and VanRavenswaay 1990). Before long, however, Kamehameha I had wrested exclusive control of sandalwood from the *ali'i*, and used the commodity to acquire luxury goods on credit with foreign merchants (Cottrell 2002). The debts that he and other *ali'i* accrued engulfed Hawaiians in a boom-and-bust industry that nearly eradicated the plants in Hawai'i (Rock 1916).

Historical descriptions of sandalwood harvesting often stress the sheer number of people who were ordered off their agricultural plots and into the forests to collect the wood. The following such account of the weighing of sandalwood in preparation for export was recorded by Mathison, ca. 1822, upon his return to Cox's residence at Kaiaka Bay in coastal Waialua where he observed the following:

> . . . At a little distance from his own hut was a large store-house, not less than fifty feet in length by thirty in breadth, and about thirty feet high, where the sandal-wood was piled up, and kept ready for embarkation; work-people of both sexes and all ages were employed in carrying it down to the beach. The Chief and his attendants directed their operations and one confidential man, whose duty it was to see fair play, stood over the weighing-machine, with the American Captain for whose ship the freight was destined. (1825:407)

In the latter years of sandalwood harvesting, stands of forest were burned so that harvesters could detect the fragrant wood by its smoke; if found quickly the trees could be felled before the valuable heartwood burned and subsequently stripped of the charred (undesired) bark and sapwood (Cottrell 2002). Sandalwood harvesting lasted until 1830, when the supply in Hawai'i and the value became too low to sustain the trade (Sahlins 1992).

Following the death of Kamehameha I in 1819, the Hawaiian religious and political systems began a radical transformation; Ka'ahumanu proclaimed herself "*Kuhina nui*" (Prime Minister), and within six months the ancient *kapu* system was overthrown. Within a year, Protestant missionaries arrived from America (Fornander 1969; 'Ī'ī 1959; Kamakau 1992). In 1820, American missionary Hiram Bingham and members of the American Board of Commissioners for Foreign Missions (ABCFM) toured the island of O'ahu seeking out communities in which to establish church centers for the growing Calvinist mission. Bingham recorded observations made during his twenty-one-year residence in the Hawaiian Islands in a journal (Bingham 1848), which offers a rare glimpse at the project area vicinity during the early 1800s. Of Waialua, Bingham wrote that "a very large concourse of people assembled on the Lord's day, for public worship in the open air" (1848:295-296). He continues his account as follows:

> After the Sabbath we examined and encouraged, and partially supplied with books, the incipient schools established there under the particular patronage of Lydia Namahana and Gideon Laanui, to whom the district belonged. There were found under Maiao and his assistant teachers, four hundred and ninety-five male and female pupils, and under Kaoo, one hundred and sixty-four, amounting together to six hundred and fifty-nine pupils, chiefly men and women. (Bingham 1848:296)

In July of 1832, the second missionary station on O'ahu, located at Waialua was started by Emerson (Bingham 1848:468). Of the population served by this station at that time, Bingham states, "The districts of Waianae, Waialua, and Koolauloa, extending coastwise about fifty miles, and embracing a population of 7300, were connected with the station, among whom about 1600 could read" (ibid.). Another visitor to O'ahu during the 1820s, Mathison, made the following observations of Waialua at that time:

> July 11.—Having enjoyed a most agreeable sail by moonlight, we this morning entered a small bay called Why-arouah, on the N.E. side of the island, formed by two reefs of rocks, which run out parallel a considerable way into the sea, and between which two small rivers discharge themselves, Hence the name Why-arouah; *Whye* in the country language signifying water, and *arouaah* the numeral two. Here a chief named Coxe [Kahekili Ke'eaumoku/George Cox], who is one of the richest and most powerful in the island, resides; and as he was the person from who our Captain was to obtain the sandalwood, our first visit was of course paid to him. He bears the name and office, if it can be so called, of Governor. His hut stands on the seashore, and was sufficiently large to accommodate the whole of our party, consisting of several Americans, besides myself.
>
> . . . he speaks English better than any other native I had yet conversed with. . . His hut might be about twenty feet square, and proportionably high, with an entrance aperture on two sides, and one above. It was fitted up as usual with mats; in the midst of it he himself sat on the ground, having no other covering than the *maro*, and was surrounded by attendants. By his side sat an intelligent-looking American sailor, who had been upwards of twenty years on these islands, and attached himself particularly to Coxe, as his patron and protector. . .
>
> In the cool of the evening I took a walk along the banks of the river, and was delighted with the beauty and fertility of the whole district. Plantations of tarrow, maize, tobacco, sweet potatoes, yams, melons, and water-melons, everywhere met the eye, all neatly arranged, and enclosed, some by stone walls, others by fences. Of trees, the cocoa-nut, bread-fruit, banana, cotton, castor, *cöey*, and *teĕ* species, were most plentiful. The latter is a shrub peculiar, I believe, to these islands, but quite distinct

> from the Chinese tea-tree. The river, in most places about one hundred feet wide and not very deep, winds its still limpid way through this cheerful scene of cultivation, where the huts rising at intervals from among small groves of bananas and bread-fruit trees, vary in a picturesque and lively manner the soft harmonious touches of nature.
>
> *July* 12.—I slept at Coxe's, who entertained us hospitably. We had several kinds of excellent fish baked for breakfast, and among the rest some uncommonly large flying fish. I took another and longer walk up the country, and met with the same abundant cultivation which I had before observed elsewhere. The natives here took little notice of us, which I attributed to their constant intercourse with the crews of ships coming for sandalwood. In less frequented places, they showed greater curiosity, and, I may add, greater kindness; for it was not unusual to receive little presents of fruit, particularly of melons, gratuitously offered as we passed their grounds. (1825:392-395)

Mathison goes on to describe a "*Hourah-hourah*" or hula dance performance that Cox gave at their request:

> . . . The spot selected for the entertainment lay in the midst of a small and verdant meadow, at the distance of about half-a-mile from the sea-shore. Close adjoining, the river before-mentioned rolled gently through the plain, reflecting in its limpid surface the broad shadows of the trees that overhung its banks, and varied here and there by the canoe of some rude islander, hastening from the opposite shore to partake of the day's revel. (1825:397)

He describes the costume of the attendants of the Chief, and the spectators' demeanor as follows:

> . . . Some wore necklaces of glass beads, or of hair finely platted and doubled to a great thickness, from which were suspended pieces of polished whale bone by way of ornament. Others had garlands of yellow flowers gracefully braided round their heads, and small looking-glasses in their hands, in the use of which they take great delight. Others, of maturer [sic.] age, had their hair besmeared with lime and water, or some such mixture. . .
>
> The majority of the spectators, male and female, smoked incessantly, and used for that purpose a curved wooden pipe, not more than three or four inches long and an inch in thickness. Here a party lay sprawling on the ground; there, another pressed towards the performers: all seemed to talk, and sing, and laugh immoderately. . . To the *maro*, commonly worn round the middle, was added, by some of the richer individuals, a loose cloth covering of British manufacture, or a blanket thrown over the shoulders. Their bodies were often, but not universally, tattooed. . . (ibid.:397-398)

The entertainment lasted about three hours and afterwards, Mathison chose to accompany two Americans on a visit to the home of a Hawaiian native for dinner rather than continue the festivities with Cox and his retinue. Mathison spent the night comfortably at the home of his host upon "clean mats, and pillows of the same material, with large and beautifully white *tappers* [kapa]" (1825:401). In exchange for the hospitality, Mathison purchased *malo* and *kapa* "of different colours, as agreeable memorials of our visit, and specimens of Sandwich Island manufacture" (ibid.:401-401). On July 14, Mathison went to visit an American sailor who had been residing on O'ahu for over five years who "cultivated a small farm" for Cox (ibid.:412):

> His property consisted of a few aces of tarrow-plantations, in the midst of a fine orchard of bread-fruit and other trees, with pasturage for a large herd of goats; and these, in addition to some pigs and poultry, rendered him rich in the eyes of all his neighbours. His cottage was well built. . . He liked his situation altogether, and thought it very preferable to a seaman's life; but complained, nevertheless, of the insecure tenure by which the property is held in this country. He told me, as others had done, that he was afraid of making any improvement and putting more land into cultivation, lest his prosperity should excite the cupidity of the Chief, who would not hesitate, if he chose it to appropriate the whole to himself. (ibid.)
>
> . . . Two or three times a day the whole party of natives, male and female, repaired to the river, and amused themselves with bathing. The women are excellent swimmers and divers, to which they are habituated form their earlies childhood, insomuch that one would almost think the water was their natural element. (ibid.:415)

Mathison wished to travel to the countryside where the sandalwood grows and to see "some ancient monuments of which a curious traditionary history had been related" to him (1825:402). Thus, he secured a guide and an American travel companion and walked twelve miles until they reached a "vast natural amphitheatre, begirt with woods and gigantic masses of stone from the summit downwards" (ibid.:403). There they spent the night and "having walked three or four miles farther, over the same uncultivated uninhabited plain, the country all at once changed its aspect, and

presented a bold outline of hills, with alternate and thickly-wooded valleys" (ibid.). It was here that their guide pointed out a flat stone "about five feet broad by six or seven in length" upon whose surface were "many rude representations of men and animals" (ibid.: 403-404; see Figure 5: Site 220 Pa Aikanaka). Mathison continues his description thusly,

> Many were defaced, and in others I could trace no resemblance to any known objects, either animate or inanimate: the stone itself was very imperfect, pieces of it having evidently been broken off on different sides. . . in order to convert the materials into knives, mirrors, pots, and other domestic utensils, which were always fabricated from stone in former times, previous to the introduction of iron by foreign traders. (ibid.:404)

Mathison goes on to recount the story of Chief Herimino as told to him by Cox. As previously mentioned, Helemano, near the project area, is associated with the legendary cannibal chief who lured his victims to the mountains. Mathison states that the stone relic was the altar upon which the cannibal chief Herimino sacrificed his victims; "near it a large round hole, about twenty feet in circumference, and still clearly discernable, was pointed out as the place where the kanakas, or men, were cooked and devoured by the Chief and his adherents" (1825:405). His account of the cannibal chief's demise differs from that told in the prior section on legendary accounts. Per Mathison, Herimino's brother-in-law killed him; but some of his followers continued to stalk and kill their human prey occasionally; "they were not finally extirpated till about forty years ago, when the principal Chief of the island, previous to King Tamahama-hah [Kamehameha], pursued and killed them all, except one man, whose life accidentally was spared" a child of this man was at the time of Mathison's writing "a menial dependant [*sic*] upon the present King, and in no respect distinguishable from any of the other natives"(ibid.).

Between 1838 and 1842, the United States Exploring Expedition under the direction of Commander Charles Wilkes, toured Hawai'i and visited O'ahu. In 1840, Wilkes made the following observation of Waialua District terrain and flora:

> The coast here forms a small bay, and has a dreary aspect on first landing. . . A short distance from the coast an agreeable change is met with, in extensive taro-patches, fish-ponds, and fine fields of sugar-cane. The habitations in this part, are neat and comfortable, and the natives cheerful and clean.
>
> . . . The district of Waialua stretches from the most westerly cape, called Kaena, to Waimea, in the district of Koolaulo [Ko'olauloa], on the northeast, and to Waianae on the southwest, a distance along the coast of above twenty miles. Within this district are a few bays for vessels not exceeding one hundred and fifty tons burden the best of these is Rawailoa [Kawailoa]. Those to the northeast are Waimea, Haula [Hau'ula], Kakua, Moluilui, and Makua. Like all the rest of the places, they are dependent on Honolulu, which is thirty miles distant for a market. A good road might very easily be constructed, and very nearly level, on the plain that lies between the two high mountain ranges which traverse the island from east to west. One of these ranges is called Konahaunui, the other Kaala; the former occupies the eastern end of the island, the latter the western. Both are basaltic. It is remarked of these two ranges, that the soil and growth of the plants are dissimilar; for instance, the kauwila, the wiliwili, the haw [*hao*], and the uhiuhi are found on the Kaala, and are either not found, or only in a dwarfish state, on the Konahaunui; whilst the acacia (koa), and the lehua, do not exist on the former, though growing luxuriantly on the latter.
>
> . . . Part of the Waialua district is cultivated by irrigation, and produces abundantly. Five considerable streams water it from the Konahaunui range, passing down fertile valleys. The largest of these is quite sufficient to supply motive power to the whole year round. . . From sources that are to be depended upon, I was informed that there are upwards of thirty square miles in the Waialua district that can be cultivated without irrigation. (1845:74-75)

Of the Native Hawaiians of Waialua, "having but few wants, and those easily supplied" Wilkes states: "they cannot yet be induced to change their ancient dwellings for better habitations, and still adhere with pertinacity to their thatched grass huts, without floors or windows, and destitute of ventilation" (1845:75). Wilkes also reports on births and deaths in Waialua district: in 1836, there were thirty-four births and ninety deaths recorded; in 1839, there were fifty-six births and one hundred and eighty-five deaths (ibid.:77). In addition, over four hundred marriages were entered into between 1832 and 1839; and the population declined from 2,640 in 1832 to 2,415 in 1836. Which he attributed to sterility and abortion (ibid.).

Regarding resources and trade across the Hawaiian Islands, Wilkes mentions the ongoing pursuits of the Hawaiians in supplying visiting whaling fleets and that sugar cultivation had begun to take over the for the failed sandalwood trade. He also stated the following:

> The islands produce but little, and their consumption of foreign products is necessarily small. The capabilities of the islands have generally been underrated, for their soil and climate are suitable for raising all tropical productions in considerable quantities, and at a moderate cost. But very little investment of capital has yet taken place, and the business that has induced the establishment of several commercial houses has been more that of transit than for the purpose of supplying the consumption of the islands, or obtaining their exports. (Wilkes 1845:261)

Wahiawā is also mentioned as the home of the The Lo Ali‘i in Kamakau’s *Ka Po‘e Kahiko* as follows:

> LO.—The chiefs of Lihue, Wahiawa, and Halemano on Oahu were called *Lo* chiefs, *po‘e Lo Ali‘i* [“people from whom to obtain a chief”], because they preserved their chiefly kapus. The men had kapus, and the women had kapus, and when they joined their kapus and children were born, the children preserved their kapus. They lived in the mountains (*i kuahiwi*); and if the kingdom was without a chief, there in the mountains could be found a high chief (*ali‘i nui*) for the kingdom. Or if a chief was without a wife, there one could be found—one from chiefly ancestors. (1964:5)

In his discussion of the life and death of Kamehameha III (b. August 17, 1813; d. December 16, 1854) in *Ruling Chiefs of Hawaii*, Kamakau tells of the young king’s proclamation for his government to be one of learning, “in which chiefs should teach commoners and each one teach another” (1992:422-423). His poetic description goes on to mention Waialua and Wahiawā as follows:

> . . . The concert exercises by which they were taught delighted the people. The rhythmical sound of the voices in unison as they rose and fell was like that of the breakers that rise and fall at Waialua or like the beat of the stick hula in the time of Pepe-io-holani and Ka-lani-‘opu‘u.

A ea mai ke kai o Waialua,	Let the sea of Waialua rise,
Wawa no‘olelo ‘oko‘a i pali,	Let the roar echo over the hills,
Nunu me he ihu o ka pua‘a hae la,	Rumble like the grunt of the wild pig.
‘Ako ka lau o ka nalu pi‘i i ka pali,	Let the rising wave break the leaf from the cliff.
Ku pali Kaiaka i ka‘ino,	Kaiaka cliff stands above the storm,
‘Ino ka lae o Kukuilau‘ania,	Stormy is the cape of Kukuilau‘ania,
He Maka-nui.	Windy indeed it is!
Makani me he ao la ka leo o ke kai,	The voice of the sea rises upon the wind
Kuli pa‘ia wawa ka uka a Lihu‘e,	Deafening those in the uplands of Lihu‘e,
O me he‘oka‘a la i ke kula,	As it is borne over the plain,
Ke kula hahi a ke kai e halulu nei,	The rumbling of the sea treading upon the plain,
Halulu ma ke Ko‘olau,	Rumbling over Ko’olau,
Ho‘olono ‘Ewa,	‘Ewa hearkens,
‘A‘ole i‘ike i ka po ana a ka nalu,	She has not seen the rising of the waves
Kuhihewa wale no Wahiawa – e.	And mistakes it for Wahiawa. (Kamakau 1992:423)

Kamakau continues by saying “schools were built in the mountains and in the crowded settlements” (1992:424) and mentions Wahiawā and Halemano specifically. Kamakau reports that between fifty and two-hundred pupils attended each school under Kamehameha III’s rule and that “Oahu was then thickly populated” (ibid.). He goes on to lament the drastic population decline thusly, “It is sad to see how in so short a time whole villages have vanished leaving not a man. . . And as the kingdom of letters moved quickly so also moved the kingdom of God. . .” (ibid.:424-425). This significant decline in the native population was already felt a mere fifty years after Hawaii‘s first contact with Europeans and Americans. Meanwhile, the Western population kept increasing. Maly summarizes the reasons for the rapid decline of native populations thusly:

> Overall, historic records document the significant effect that western settlement practices had on Hawaiians throughout the islands. Drawing people from isolated native communities into selected village parishes and Hawaiian ports-of-call, had a dramatic, and perhaps unforeseen impact on native residency patterns, health, and social and political affairs. In single epidemics hundreds, and even thousands of Hawaiians died in short periods of time. (1998:36)

The *Māhele ʻĀina* of 1848

The profound religious, socioeconomic, and demographic changes that took place in the early 1800s resulted in the establishment of a Euro-American style of land tenure, and the *Māhele ʻĀina* of 1848 or Great *Māhele* was the vehicle used to divide the land between the crown, government, *konohiki,* and native tenants. Prior to this land reformation, all the land and natural resources of Hawaiʻi were held in trust by the *aliʻi* who, in concert with *konohiki* land agents, meted out use rights to the native tenants at will.

During the *Māhele* all lands were placed in one of three categories: Crown Lands (for the occupant of the throne), Government Lands, or *Konohiki* Lands; all three types of land were subject to the rights of the native tenants therein. The *aliʻi* and *konohiki* were required to present their claims to the Land Commission to receive a Land Commission Award (LCAw.) for lands provided to them by Kamehameha III. They were also required to provide commutations to the government in order to receive royal patents on their awards. The lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission and subsequent land transfers (Chinen 1961). Native commoners could also register claims for land with the Land Commission, and if substantiated, they would receive a LCAw., often referred to as a *kuleana*; upon confirmation of a claim, a survey was required before the Land Commission could issue a *kuleana* award.

The *ahupuaʻa* of Wahiawā was not named or claimed in *Māhele* (Soehren 2008); and no *kuleana* awards were issued within or in the vicinity of the current project area. In contrast during the *Māhele,* chiefess Victoria Kamāmalu turned over parts of Kamananui "as commutation of the royal right," which along with the remainder of the *ahupuaʻa* "became government lands when the king divided his holdings between public and Crown property" (Sahlins 1992:190 n.16). According to the Waihona ʻĀina Database, twenty-seven *kuleana* claims were made within Kamananui Ahupuaʻa, of which only two were awarded in coastal Kamananui.

Wahiawā and Waialua District After the *Māhele* (1850-1935)

The reason Wahiawā was not claimed during the *Māhele* is that, in 1850 a resolution of the School Act was adopted at a meeting of the Privy Council which appropriated lands across the Hawaiian Islands "for the general purpose of education" and "to provide for the better support and greater efficiency of the public schools" (Hawaii State Archives [HSA] Interior Department-Lands, incoming letter December 23, 1850). Included in this resolution was Wahiawā in Waialua, which was classified as "remnant/leased" and not associated with a grant number or *Māhele* award number (MA/LCAw.). In a memo dated February 21, 1851, A.G. Thurston wrote on behalf of the Minister of the Interior to inform Reverend J.S. Emerson of Waialua that because Wahiawā had been set apart as one of the School Lands by resolution of the Privy Council Emerson was "no longer at liberty to sell any portion of it & that all persons wishing to purchase there will be under the necessity of applying to the Minister of Public Instruction" (HSA Interior Department-Lands Letterbook 3 p. 130). Figure 7 shows the project area within Wahiawā, which is labelled as "School Land" on an 1881 Hawaiian Government Survey map (Reg. Map no. 1381).

Following the *Māhele,* the Hawaiian kingdom initiated a grant program in an effort to encourage more native tenants to engage in fee-simple ownership of parcels of land. These parcels consisted primarily of Government lands-those lands given outright by the King or commuted to the Government by the *aliʻi* in lieu of paying the commutation fees on the parcels awarded them during the *Māhele*. These land grants ranged in size from roughly ten acres to many hundreds of acres—larger than those generally available through the Land Commission. When the sales were agreed upon, Royal Patents were issued and recorded following a numerical system that remains in use today. The process for applications was clarified by the "Enabling Act," which was ratified on August 6, 1850. The Act resolved that portions of the Government Lands established during the *Māhele* should be set aside and sold as grants. The stated goal of this program was to enable native tenants, many of whom were not awarded *kuleana* parcels during the *Māhele*, to purchase the lands upon which they lived, or land that they felt they could cultivate (Maly 1998). Despite the stated goal of the grant program many of the Government Lands were eventually sold to foreigners.

In a letter dated October 22, 1847 to the Minister of the Interior John Young, rancher James Robinson requested to lease the land called Wahiawā from the government (HSA Interior Department-Lands, incoming letter October 22, 1847). The reason for his request was as follows:

> The reason we are desirous of having said land is the difficulty of keeping our cattle at Halemano from running on Wahiawa, which they are now in the habit of doing. If any other person should get said land it might cause trouble to us, and we therefore offer you an annual rent of $150, for the above term [of 50 years]. (HSA Interior Department-Lands, incoming letter October 22, 1847)

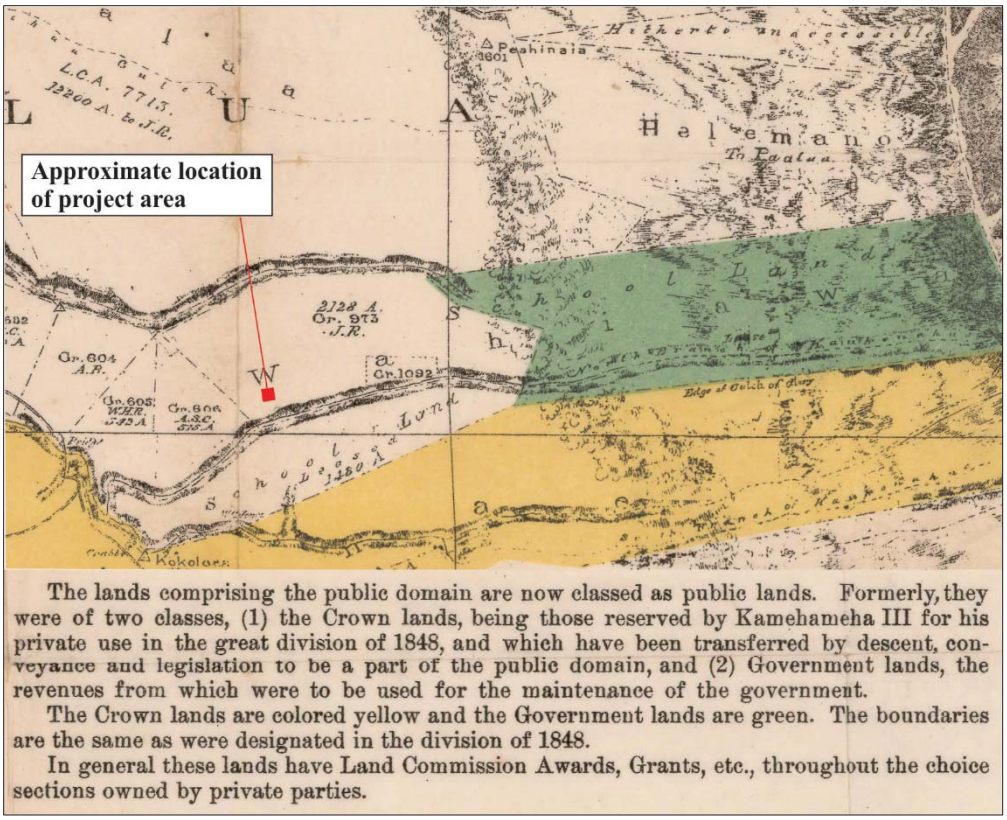


Figure 7. Portion of 1881 Hawai‘i Registered Map 1381 showing project area location and Wahiawā as school land with associated notations from the map legend.

Robinson goes on to state that “the land has not been surveyed but the ancient boundaries are well known to the natives, and can easily be pointed out” (ibid.). In a subsequent letter dated October 27, 1847, G.M. Robertson states that Wahiawā was close to Robinson’s land in Halemano and that there was “no other land between” and that Wahiawā belonged “to Waianae” (HSA Interior Department-Lands, incoming letters October 27, 1847). In this same letter, Robertson mentions Robinson’s interest in wishing to cultivate cotton. A notation written in pencil at the bottom of the letter and initialed G.M.R. reads as follows: “The Ahupuaa of Waianae belongs to the King & I believe Wahiawa is included in it” (ibid.). On the reverse of the same letter, also in a pencil-written note is the following statement: “Resolved, that the Minister of Interior make a thorough inspection, and to lease the land, upon giving their consent to plant same in cotton” (ibid.).

In 1852, the current project area was included as part of Grant 973, which was issued to James Robinson, Robert Lawrence, & Robert W. Holt. On the survey map (Figure 8) that accompanied their application, Grant 973 comprised “1943 acres of land in Wahiawa, Oahu, as described in this draught, not including the 185 acres granted to Paaluhi [Grant 1092, located to the east of the project area]” (Emerson 1852: Reg. Map No. 80). However, Grant 973 appears as 1,492 acres on the official Government Grant paperwork and a 1901 map of the lands belonging to Waialua Agricultural Company, a plantation that will be discussed in detail in a forthcoming section.

Shortly after these grants were secured, in 1859, “the differences between names and boundaries of ancient geographic districts in common usage, and those referred to in the *Mahele* of 1848 and in the *Laws* of 1840 and 1847, were adjusted by act of the legislature” (King 1935:216). King then cites Section 498 of the Civil Code of 1859, as follows (emphasis added):

> For taxation, educational and judicial purposes, the several islands shall he divided into the following districts:
>
> The island of Oahu shall be divided into five districts, as follows: 1. From Maunalua to Moanalua inclusive, to be styled the Honolulu district; 2. Ewa and Waianae to be styled the Ewa district; 3. Waialua; 4. Koolauloa; 5. Koolaupoko. (ibid.)

Thus, O‘ahu’s districts were reduced from six to five with the consolidation of ‘Ewa and Wai‘anae districts, into ‘Ewa.

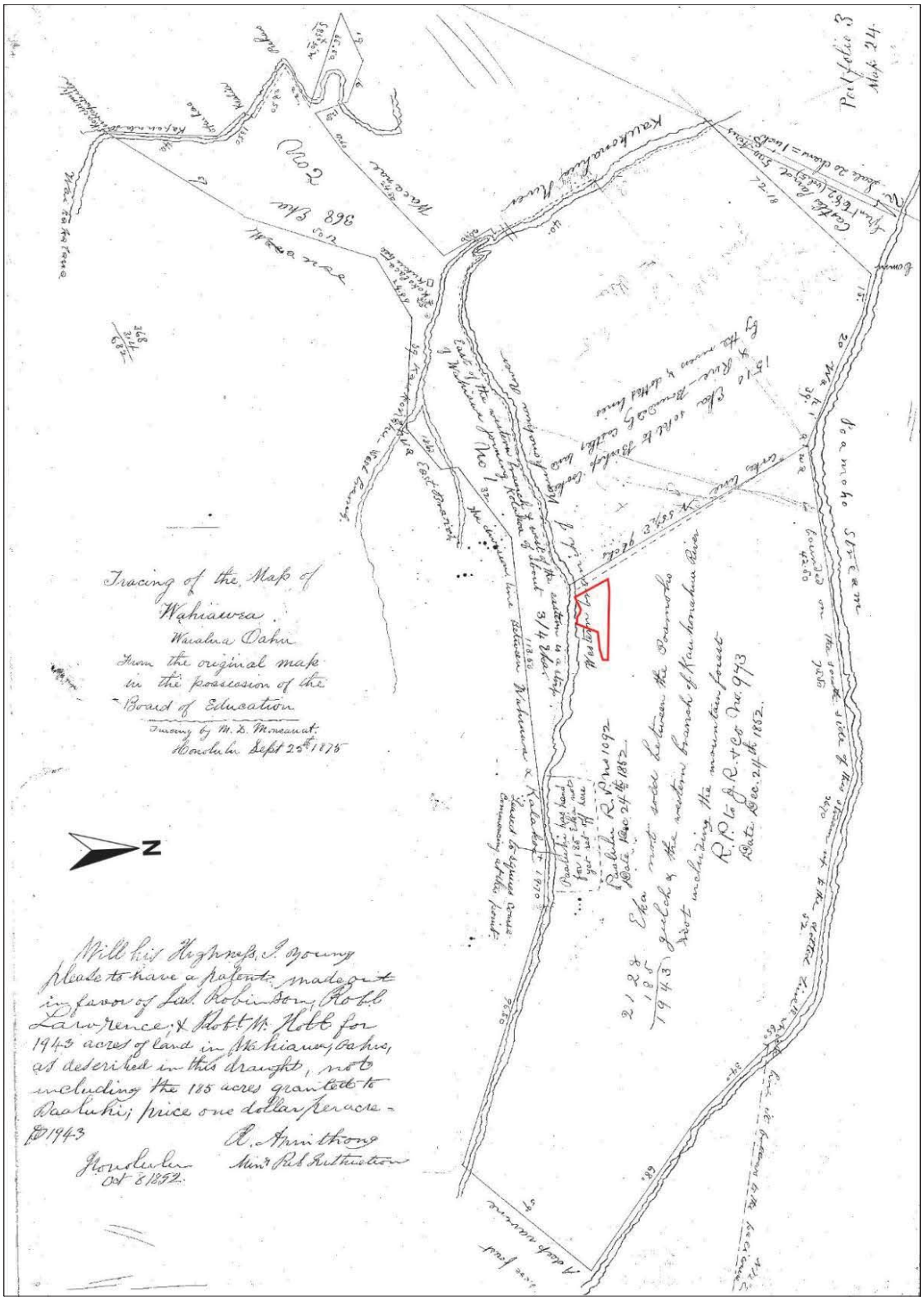


Figure 8. 1852 Hawai'i Registered Map 80 showing Royal Patent (R.P.) Grant 973 with approximate location of project area outlined in red.

In 1862, the Commission of Boundaries (Boundary Commission) was established to legally set the boundaries of all the *ahupua'a* that had been awarded as a part of the *Māhele*. However, boundary descriptions were not collected for all *ahupua'a*. The primary informants for the boundary descriptions were old native residents of the lands, many of which had also been claimants for *kuleana* during the *Māhele*. This information was collected primarily between 1873 and 1885 and was usually given in Hawaiian and transcribed in English as they occurred.

Based on a review of Boundary Commission documentation housed at the Hawaii State Archive (HSA) certification of the boundaries of "the Crown Land of Waianae Uka and the School Land of Wahiawa" were recorded under the same entry (Commissioners of Boundaries n.d. Oahu, Volume 1:344). On September 4, 1869, the Commissioner of Boundaries for the Island of Oahu, W.P. Kamakau, certified the boundaries between Waianae Uka and Wahiawā; and filed the permanent boundaries as of January 28, 1876. The following excerpt is taken from the Boundary Commission book:

> The boundary line between Waianae Uka and Wahiawa is as hereinafter mentioned that is to say.
>
> Beginning at the South end of the Bridge over the Kaukonahua river, the boundary will run South 27° 41' East true bearing 611 feet to a marked Stone, and thence along the top of the bank on the South side of the Kaukonahua gulch.
>
> North 81° 5' East 446 feet.
>
> South 5° 42' East 337 feet.
>
> South 1° 55' East 1131 feet
>
> South 47° 5' East 778 feet and thence along the edge of the bank to a point.
>
> South 74°38' East 1809 feet from the last.
>
> Thence along the edge of the bank. South 14° 48' East 1245 feet to an ancient Kahua Maika at a place, called Kokoloea.
>
> Thence South 60° 34' East 705 feet to a concrete post, which is a trig Station of the Government Survey near the 19th mile Stone from Honolulu.
>
> Thence the boundary will run. North 72° 50' East in a straight line 4312 feet to a red wood post on the South side of the Southern branch of the Kaukonahua river at a place called "Paha" opposite a Koa Tree where the ancient boundary will run North 67° 01' East true bearing (Magnetic North 58° East) 15,494 feet to a marked Koa Tree near the South side of the Wahiawa gulch. Thence the boundary follows the top of the "pali" on the South side of the Wahiawa gulch, to the summit of the dividing ridge between these lands and Koolau, this last point being:
>
> North 76° 02 East true 44,114 feet from the aforesaid post near Kokoloea. (Commissioners of Boundaries n.d. Oahu, Volume 1:344-345)

Within the same boundary commission volume as reported under the description of the Ahupua'a of Waianae, Commissioner of Crown lands John Dominis requested that the boundaries of Waianae be settled, in November of 1868. The boundary notes for Waianae Ahupua'a mention that Wahiawa to the north is for the school (Aoao Akau Wahiawa no ke Kula); and further testimony given by Kekau for Waianae talks about the upper/inland portion of Waianae Ahupua'a being adjacent to Wahiawa. However, in a letter dated October 6, 1870 W.P. Kamakau states that portions of the boundary between Wahiawā and Wai'anae were questionable, based on the information he gathered from a Wai'anae resident named Mr. Squares (HSA General Correspondence Records Relating to Land [Public Instruction], letter October 6, 1870).

In a response to Kamakau's claim about the boundary dispute between the Wahiawā School Lands and the Crown Lands of Wai'anae dated January 6, 1870, Attorney General, Stephen Phillips recommended against making the dispute a public controversy (HSA General Correspondence Records Relating to Land [Public Instruction], letter January 6, 1870). Phillips goes on to say "the commissioner of Crown Lands, although they unquestionably desire a thorough investigation of the boundary dispute will not desire to secure any result through a misunderstanding" (ibid.). And concludes the letter in the following manner "as a majority of the commissioners of Crown Lands are also members of the Board of Education, it is hardly to be supposed that they will desire so much unnecessary trouble" (ibid.).

Despite the opinion of some that Wahiawā was part of Wai'anae, a letter dated December 5, 1865 refers to the School Lands called Wahiawā in Waialua (HSA General Correspondence Records Relating to Land [Public Instruction], letter December 5, 1865); as do other letters dated January 11, 1866 and March 22, 1867 (HSA General Correspondence Records Relating to Land [Public Instruction]). Another document—a solicitation for purchase or

lease of Wahiawā lands at Waialua to make "permanent improvements and to develop the resources of the Island of Oahu"—dated September 22, 1875 provides other details about the project area vicinity. In this letter, W.G. Jones describes Wahiawā as comprising "the peninsula between the West and East branches of the Kaukonahua Stream" and the "land which lies makai or West of the East branch of the Kaukonahua Stream. . . in all containing an area of 682 acres" (HSA General Correspondence Records Relating to Land [Public Instruction], letter September 22, 1875). Jones also offers to purchase only the land in the "peninsula," if "the Board [of Education] does not desire to sell or lease the portion makai or West of the East branch of Kaukonahua, owing to the unsettled condition of the boundary, of that tract"; as well as "lease the unsurveyed mountain portion of Wahiawa" (ibid.). Thus in 1875, the boundaries of Wahiawā remained somewhat unclear contrary to Robinson's aforementioned 1847 claim.

In another (undated) letter received by the Minister of the Interior September 23, 1875, Jones offers to "purchase all the remaining interest in the School Lands of Wahiawa, District of Waialua" and "have the lands surveyed and the boundaries settled at my own expense" (HSA Interior Dept Lands – Incoming letter). Other correspondence from 1877 shows W.G. Jones still interested in purchasing portions of land at Wahiawā and mentions a 10-year lease he entered into on October 15, 1875, culminating in a letter dated September 27, 1877 to the Board of Education in which he requests permission to transfer his lease of Wahiawā to Gilbert Waller who wished to plant cane "and thus improve the value of the land" (HSA General Correspondence Records Relating to Land [Public Instruction], letter September 27, 1877). Per Jones, he had "already made valuable improvements and placed buildings upon the land, and Mr. Waller designs to male greater and more valuable improvements" (ibid.). The transfer was finalized in a resolution of the Board of Education on October 13, 1877. In a letter dated October 4, 1877 Waller requested that his newly acquired lease be extended from ten to twenty years in order for him to "get the water from the gulch on to the main-land for use for irrigation etc." (HSA General Correspondence Records Relating to Land [Public Instruction], letter October 4, 1877). Waller offered to bind himself "to bring on the water from the Kaukonahua Stream and leave the auwai in good working order at the expiration of the lease" or to purchase the land at Wahiawā in its entirety (ibid.). This proposal was accepted by the Board of Education as evidenced by a subsequent letter from Waller dated October 16, 1877 in which he expressed his agreement and acceptance of the terms (HSA General Correspondence Records Relating to Land [Public Instruction], letter October 16, 1877).

Another minor change to district boundaries occurred in 1886, when Waialua District was expanded to include the Waimea Ahupua'a, originally in Ko'olauloa District (ibid.:218). In 1909, Act 84 of the Session Laws of 1909 once again divided O'ahu into six districts, which separated Waianae and 'Ewa, and expanded Waialua District from "Kaena Point to and including the ahupuaa of Waimea and Waia-nae Uka" (ibid.:220), which were formerly parts of Ko'olauloa and Wai'anae districts, respectively. As of 1896, Wahiawā was still considered School Lands under the jurisdiction of the Board of Education as referenced in a letter from Mark P. Robinson dated March 11, 1896, in which he requested a 30-year lease of the unsold lands of Wahiawā (HSA General Correspondence Records Relating to Land [Public Instruction], letter March 11, 1896).

No additional changes were made until 1913 when Act 112 of the Laws of the Territory of Hawaii created a new landlocked district named Wahiawā, "in which the *ahupuaas* of Wahiawa and Waianae Uka were taken from Waialua [District] to form this new and seventh district of Oahu" (King 1935:221). As a result of this new configuration, the current project area falls within Wahiawā District, as it appears in a 1902 map reproduced as Figure 9, below. King goes on to explain the motivation for this change as follows:

> In 1899, a tract of some 1320 acres of Wahiawa, formerly in pasture, was subdivided into agricultural homestead lots and by 1913 quite a community had developed in this section whose aspirations for independence from Waialua district were met by the creation of a new district. (ibid.)

As previously mentioned, the *ahupua'a* of Wahiawā was not named or claimed in the 1848 *Māhele 'Āina* (Soehren 2008) but it does appear in the 1875 map that accompanied the grant application for Grant 973 reproduced as Figure 7 above. The map is labeled "Tracing of the Map of Wahiawa, Waialua, Oahu," which indicates that Wahiawā in this context was a smaller land division within Waialua District. Two other notations on the same map reads as follows: "East of the western branch and west of the eastern is a strip of Wahiawa joining Kalakoa of about ¾ eka [acre]" and "The division line between Wahiawa and Kalakoa." These are references to Kalakoa, which is defined by Soehren (2008) as "a point on the Wahiawa boundary" within Wahiawa Ahupua'a based on Boundary Commission Testimony.

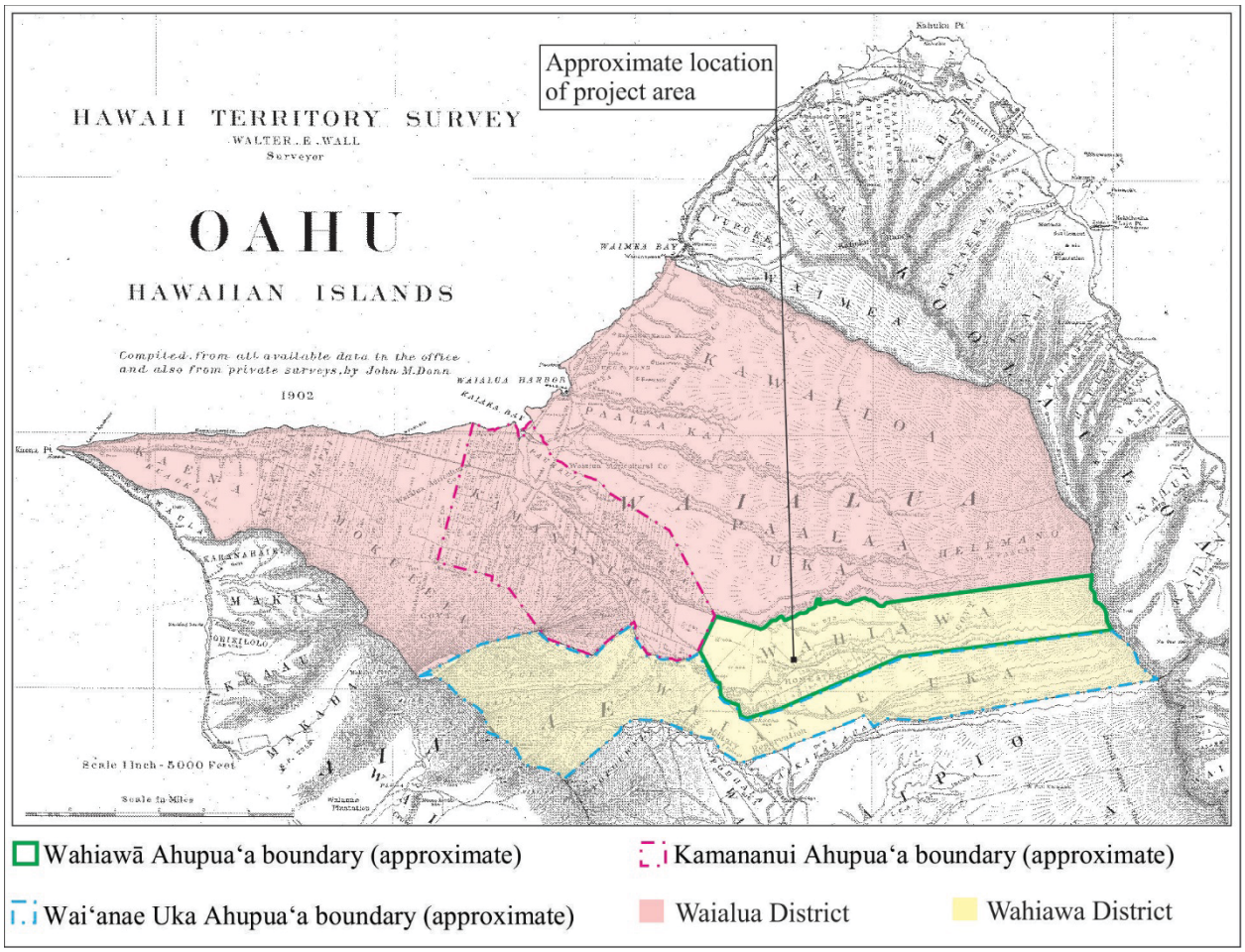


Figure 9. 1902 Hawai'i Registered Map 2374 (W.E. Wall) showing the project area location within Wahiawā Ahupua'a, Wahiawā District at that time.

In the session laws of 1925, "the district of Wahiawa on Oahu was expanded on its north and south sides by taking respectively from Waialua and Ewa, large irregular tracts of land" (King 1935:222). King goes on to explain the next suite of changes to impact the project area vicinity as follows:

> In the special sessions of 1932, at the time many of the tax laws were repealed, generally overhauled and new laws enacted, it was deemed necessary and convenient to revise the boundaries of certain districts on Maui and Oahu. These changes also fitted in with the population areas for election and other purposes and no difficulty was encountered in making them. (ibid.)

He continues thusly (emphasis added),

> The incongruous boundaries of Wahiawa on Oahu created in 1925 were abrogated and the district restored to its boundaries of 1913, to which were added small tracts of land in Ewa and Waialua acquired by the United States and included within the Military Reservation of Schofield Barracks"
>
> As Act 68 of the Second Special Session of 1932 remains in force to-day [at the time of his writing, ca.1935], it is herewith, quoted in full:
>
> > SECTION 2. Subdivision 3 of Section 144 of the Revised Laws of Hawaii 1925, as amended by Act 13 of the Session Laws of Hawaii 1925, is hereby amended to read as follows:
> >
> > **3-**
> >
> > The island of Oahu shall be divided into seven districts as follows:
> >
> > 1 From Makapuu Head in Maunalua to Moanalua inclusive, and the islands not included in any other district, to be styled the Honolulu district;
> >
> > 2. Ewa, to be styled the Ewa district;
> >
> > 3. Waianae excluding Waianae Uka to be styled the Waianae district;

> 4. From Kaena point to and including the ahupuaa of Waimea excluding Wahiawa, hereinafter described, to be styled the Waialua district;
>
> 5. From Waimea to Lae o ka Oio. to be styled the Koolauloa district;
>
> 6. From Lae o ka Oio to Makapuu Head in Waimanalo. to be styled the Koolaupoko district:
>
> 7. Wahiawa and Waianae Uka lying between Ewa and Waialua districts and more particularly described in the following manner: Beginning at Puu Kaaumakua in the Koolau range and running to and along the south boundary of Waianae Uka (which is also the south boundary of Schofield Barracks Military Reservation) to Puu Hapapa in the Waianae range; thence continuing along Schofield Barracks Military Reservation northerly along the Waianae range to Puu Kaala, easterly along Mokuleia down ridge to Puu Pane, continuing to Maili Trig. Station, and down ridge to Haleauau stream and down Haleauau stream to Kaukonahua gulch, and easterly along said gulch to the west boundary of the ahupuaa of Wahiawa; thence leaving Schofield Barracks Military Reservation and following up and along the west and north boundaries of the ahupuaa of Wahiawa to the Koolau range: thence along the Koolau range to the beginning; to be styled the Wahiawa district. (ibid.:223)

Regarding the etymology of Wahiawā, Pūkuʻi et al. translate it as "place of noise" and add that "rough seas are said to be heard here" (1974:218) as in the Legend of Hiʻiaka as recorded by Emerson (1915) presented above. Handy et al. (1991), further explain that the sound of rough seas was said to be carried inland from the coast, as reflected in some of the *moʻolelo* and *mele* presented in the preceding section on legendary accounts.

In sum, Wahiawā Ahupuaʻa has been associated with three districts: Waiʻanae, Waialua, and Wahiawā over time. Following the *Māhele* however, this land division has been considered to either be within the district of Waialua or Wahiawā. The current project area is situated within the western portion of Wahiawā Ahupuaʻa which comprises the northern portion of Wahiawā District (Figure 10).

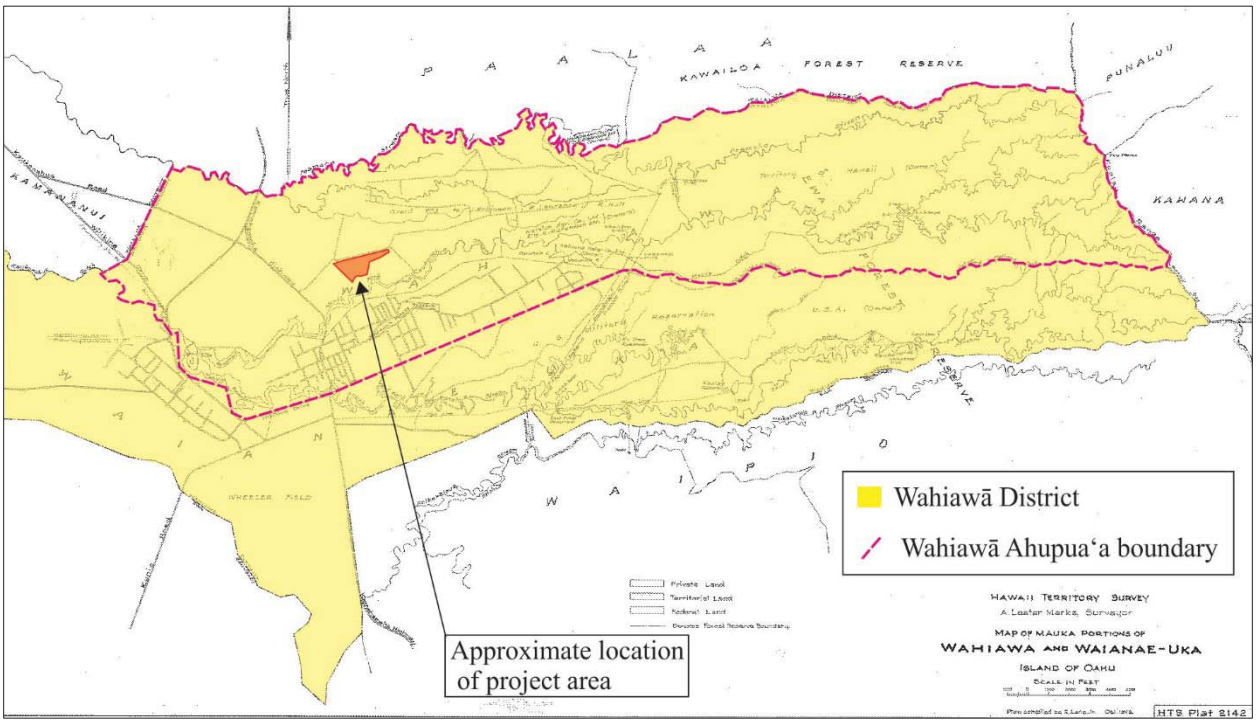


Figure 10. 1948 Hawaii Territorial Survey Map 2142 showing project area within Wahiawā Ahupuaʻa and District.

Post-*Māhele* Historical Accounts (1850-1880)

In the decades following the *Māhele*, more visitors and foreigners who settled in Hawai‘i, as well as Native Hawaiian Historians began recording their observations of daily life in the Hawaiian Islands. For instance, in *Fragments of Hawaiian History*, Historian John Papa ‘Ī‘ī (1800-1870) recounts details of the extensive trail networks throughout leeward O‘ahu as he had experienced them in the early 19th century. ‘Ī‘ī described a major trail, generally following the current alignments of several state and federal highways. Portions of this trail connected coastal Waialua with inland Wahiawā (Figure 11):

> From the stream of Anahulu and from Kamani, above the houses and taro patches, a trail stretched along in front of Kuokoa's house lot and the church. This trail went on to meet the creeks of Opaeula and Halemano, the sources of the stream of Paalaa, on down to the stream of Poo a Moho, and on to the junction where the Mokuleia trail branched off to Kamananui and Keawawahie, to Kukaniloko, the birthplace of chiefs (‘Ī‘ī 1959:98).

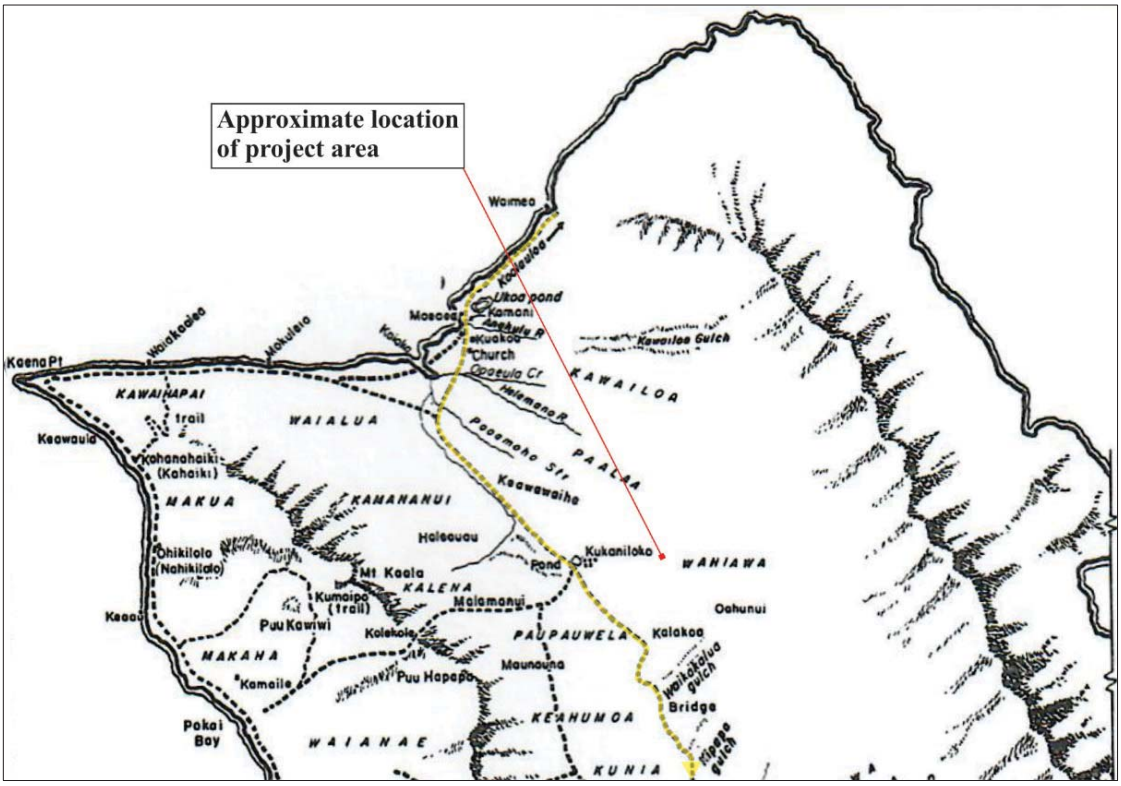


Figure 11. Portion of map by Rockwood based on descriptions by ‘Ī‘ī showing a trail near project area highlighted in yellow (1959:96).

Another brief account composed by Thrum (1901) speaks of the history and of travel upon the road connecting Honolulu with Waialua, which was published in the *Hawaiian Almanac and Annual for 1902*, as follows:

> The road to Waialua, Oahu, was completed about 1850, but a local paper of August, 1852, records the fact "that a lady performed the trip recently from Honolulu to Waialua in a wagon in one day. This is the first time, we believe, a wagon has ever passed over this 30 miles of road. (1901:9)

During the early 1870s, American journalist Charles Nordhoff visited the Hawaiian Islands and documented his travels in his book titled *Northern California, Oregon, and the Sandwich Islands* originally published in 1874. He made the following recommendations to his readers to indulge themselves with a ride around the island of O‘ahu. Per Nordhoff, all you needed were four days, the ability to sit in the saddle, and a pack-mule; he continues as follows:

> . . . you will sleep every night at a plantation or farm. The roads are excellent for riding, and carriages have made the journey. . . If you are accustomed to ride, and can do thirty miles a day, you should sleep the first night at or near Waialua, the next at or near what is called the Mormon Settlement [Laie], and on the third day ride into Honolulu. If ladies are of your party, and the stages must be shorter, you can ride the first day to Ewa, which is but ten miles; the next, to Waialua, eighteen miles

> further. . . Any one [*sic*] who can sit on a horse at all will enjoy this excursion, and receive benefit from it; the different stages of it are so short that each day's work is only a pleasure. On the way you will see. . . near Waialua an interesting boarding school for Hawaiian girls, in which they are taught not only in the usual school studies, but in sewing, and the various arts of the housewife. If you are curious to see the high valleys in which the famous Waialua oranges are grown, you must take a day for that purpose. (1974:32)

In the chapter devoted to his travels on O'ahu during the first half of 1880, George Bowser makes the following observations of neighboring Kamananui and greater Waialua District:

> Leaving this spot [Waimea Valley], which must hereafter become the seat of a considerable population, I followed the Waialua road, which follows the sea beach for about a mile and a half. At this place, between the beach and the cultivable land, there lies a strip about half a mile wide composed of nothing but boulders. . .
>
> Again I passed on to another fertile valley, the Kamananui. At the head of this, closeup to the mountains, is the sugar plantation of Messrs. Halstead & Gordon, one of the most extensive and valuable on the island of Oahu. Mr. Halstead is a thoroughly experienced manager, and everything on the place has thrift and industry written on the face of it. I was made right at his hospitable house, where he resides with Mrs. Halstead and his family. A lovely view of the ocean is to be had from the front of the house, and when I as there the scene was further enlivened by the presence of a fine schooner in full sail on her way to Honolulu. There is plenty of good fishing in this valley; both fresh and salt water fish being abundant. Excellent shooting, too, is available for the sportsman.
>
> At Waialua I found no less than three native churches, a female seminary, three native schools and St. Stephen's Episcopal Mission School. (1880:489)

Waialua Agricultural Company (1898-1996)

The history of Waialua Agricultural Company is directly linked with that of B. F. (Benjamin Franklin or "Frank") Dillingham's Oahu Railway and Land Company (O. R. and L.) and Jim Dole's Hawaiian Pineapple Company, which will be discussed in further detail in a forthcoming section. The following history of the O. R. and L. is taken largely from a biography of Dillingham penned by Yardley (1981). In June of 1888, William R. Castle introduced the Dillingham Bill, which was not approved as it was initially proposed but the government drafted another bill and on September 11, 1888 King Kalakaua signed the railroad bill in favor of Dillingham (Yardley 1981:127). Although railroads, largely associated with the sugar industry, were already in operation around Hawai'i Island, O'ahu was undeveloped in comparison. According to Yardley, "Kalakaua's signing of the railroad bill signaled the start of a year and a half of frenetic activity during which B. F. Dillingham changed the map of Oahu forever" (ibid.:131).

On February 4, 1889, Lorrin A. Thurston, Minister of the Interior, issued a charter for the O. R. and L. as a railroad as well as a land development company. On March 8, 1889, the formal groundbreaking took place at Moanalua near the intersection of Middle Street and Kamehameha Highway. On September 4, 1889, nearly 150 people rode a little over a mile from the terminal at Iwilei Road to the rice fields in Kapālama. In 1893, Dillingham secured a contract to extend the O. R. and L. to Waianae and beyond to Kahuku, a total of fifty-four miles. On July 4th, 1895 the railroad celebrated its completion to Waianae.

In 1897, Dillingham acquired control of ranch lands in Kawailoa and Mokulē'ia *ahupua'a* for a total of 7,000 acres for the commercial cultivation of sugar cane in Waialua District (Yardley 1981). Dillingham had his sights on Gordon and Halstead & Sons (Halstead Brothers) Plantation—a small sugar operation comprising several hundred acres in Waialua and hoped to extend the O. R. and L. around Ka'ena Point to the Halstead mill on the north shore of O'ahu (Figure 12). In June of 1898 the O. R. and L. finally reached Halstead Mill at Waialua (ibid.:194). By this time, Dillingham was closer to his goal of creating a large sugar plantation in Waialua, but the Halstead Brothers Plantation would need to modernize as well as expand in acreage. For instance, before the O. R. and L. reached Waialua, the cane grown at Halstead Plantation was hauled to their mill using ox-drawn carts rather than a narrow-gauge railroad system as on most larger plantations; and the sugar produced "was carried in longboats to schooners or small steamers lying offshore and then taken to Honolulu for reshipment" (Yardley 1981:130). Furthermore, Halstead Plantation was "surrounded by thousands of uncultivated acres divided into small parcels with numerous owner, many of them Native Hawaiians" (Dorrance and Morgan 2000:47). Thus, in October of 1898, at the behest of Dillingham, Castle & Cooke acquired 10,000 acres of land for sugar cultivation and 12,000 acres at higher elevations that would prove more suited for pineapple cultivation to form Waialua Agricultural Company, Ltd. (WAC) (Taylor et al. 1967).

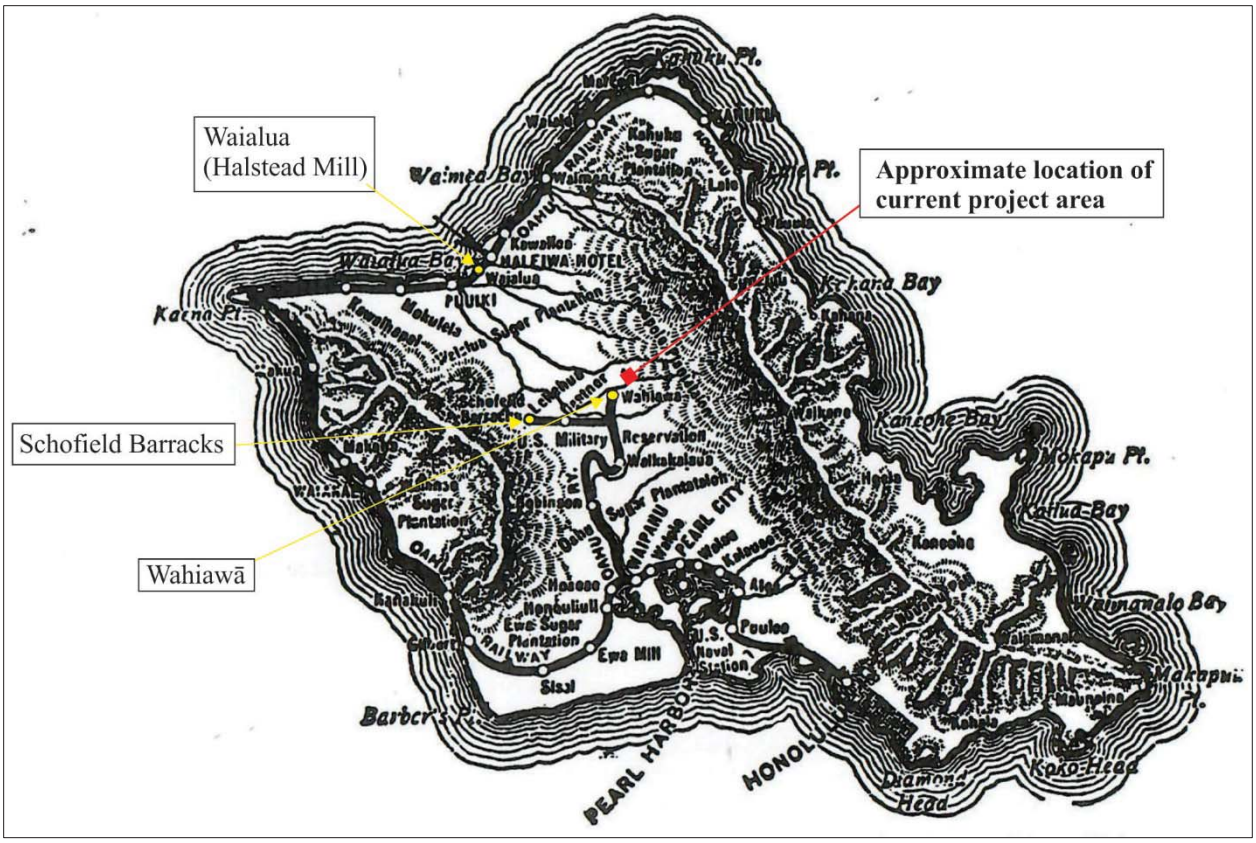


Figure 12. The completed O. R. and L. including the project area location relative to other locales mentioned in the discussion (Bishop Museum photo as reproduced in Yardley 1981:198).

Castle & Cooke was founded in 1851 by American missionaries Samuel Northrup Castle and Amos Starr Cooke who built their partnership into one of the most successful Hawai‘i based corporations through over a century of investments and land acquisitions. WAC acreage (Figure 13) comprised Halstead Brothers Plantation, lands sublet from Dillingham, and lands leased from Bishop Estate, in addition to lands leased and purchased from private owners (Dorrance and Morgan 2000). The acquisition was not without its challenges however; for,

> Waialua sprawled over rugged terrain at many altitudes; it had a heavier, but by no means dependable, rainfall, and the land ownership was a jumble. Many of Waialua’s water rights dated from ancient taro patches, irrigated by the mountain waters ever since the Polynesians settled Oahu. Leases or fee-simple titles had to be negotiated with hundreds of ownerships, covering cane lands, water rights, forest reservations, ranch lands, and lands not suited for cane but necessary for investment protection. Some of the owners or lessees had, in turn, leased to small cane, rice, taro, and pineapple growers. (Taylor et al. 1976:130)

WAC operated at a deficit for nearly ten years but 1908 marked WAC’s first profits, which coincided with the successful completion of a major irrigation project (Taylor et al. 1976). This engineering feat consisted of the damming of Kaukonahua Stream to catch and divert the rainfall of the Ko‘olaus: “By 1928 the engineering that rerouted the rainfall put Waialua’s annual sugar production into the 50,000-ton class along with Ewa [Plantation]. Waialua was to join Ewa as two of the largest, most efficient sugar plantations in Hawaii” (Taylor et al. 1976:131). Another important development devised by WAC was the use of derrick loading to move harvested cane onto the railway cars in the cane fields, which was first implemented in 1920 (Dorrance and Morgan 2000). In addition, WAC installed a 450-kilowatt hydroelectric power plant at Kaukonahua in 1916 that was capable of producing excess power, which WAC could sell for profit (ibid.; Wilcox 1996:170). However, “it was almost impossible to have a lone operator stay up there at night on account of the ghosts: it was two men or nothing” thus, “as it would have cost too much to automate for the small amount of power the plant produced, it was closed in 1960” (Wilcox 1996:170).

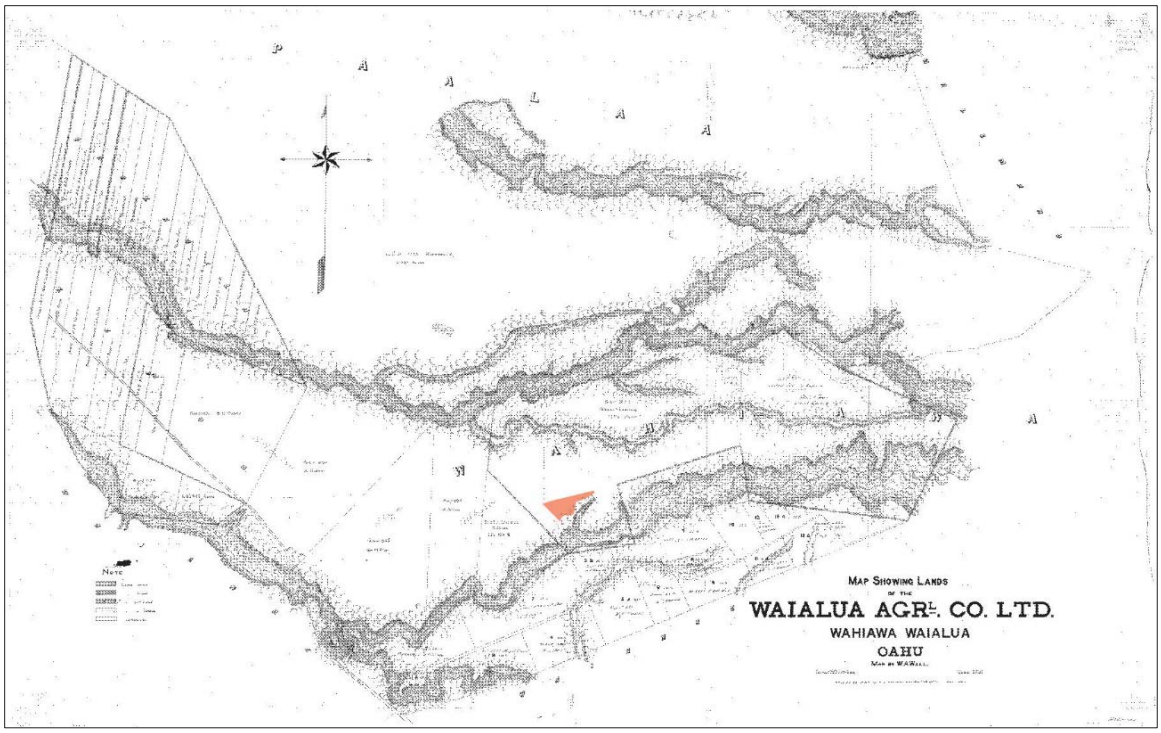


Figure 13. WAC lands showing approximate location of the current project area (shaded red) ca. 1901.

In her book titled *Sugar Water*, Carol Wilcox presents the following information about how WAC, then known as Waialua Sugar Co., was extremely efficient because of its irrigation and water storage system:

> . . . The distribution of water is especially flexible: the ditches are so interconnected that nearly all the water can be sent to any given place. This plantation has four surface-water collection systems—the Wahiawa, Helemano, Opaeula, and Kamananui—all built between 1900 and 1906. The Wahiawa-Lake Wilson system, by far the largest, delivers 10 to 12 billion gallons a year, Helemano around 700 million, Opaeula 350 million, and Kamananui 90 million. In short, Waialua Sugar Company has the largest water storage capacity in Hawaii. (1996:109)

The "Wahiawa-Lake Wilson system" mentioned in the excerpt above refers to the Wahiawā Dam and Reservoir, which became known as Lake Wilson and today is referred to as Wahiawā Freshwater State Recreation Area. Per Wilcox, the earthen Wahiawā Dam is located within Kaukonahua Gulch and the resultant 7-mile long reservoir is fed by a ditch system known as the "Oahu Ditch" and later the "Mauka Ditch Tunnel," which fed the reservoir with water diverted from both the Kaukonahua and Poamoho watersheds to provide ninety percent of WAC's surface water (ibid.).

Around the same time that WAC dammed Kaukonahua Stream, they were leasing lands for commercial pineapple cultivation:

> Between 1907 and 1909, Waialua Agricultural Company leased 3,000 acres of land not suitable for sugar to Dole's Hawaiian Pineapple Company and other pineapple operators. By 1913, when planters had more than 6,000 acres of Waialua's land in pineapple, the sugar company began to wonder if it shouldn't go into business directly. But it did nothing.
>
> By 1916, Jim Dole had leased 3,676 acres from Waialua. The California Fruit Canners' Association, which had absorbed the Hawaiian Preserving Company (and would later become part of California Packing Corporation and then Del Monte), had 4,315 acres of Waialua land in pineapple. (Taylor et al. 1976:165)

Per Taylor et al., in 1922 Dole gave WAC one-third ownership of Hawaiian Pineapple Company Dole in exchange for another 12,000 acres of WAC lands (1976:165). In 1932, Castle & Cooke invested in Hawaiian Pineapple Company "to save Jim Dole's depression-plagued firm from going bankrupt and to keep controlling ownership in island hands" (ibid.:161); subsequently, WAC owned thirty-seven percent of Hawaiian Pineapple (ibid.). Within a few years, Castle & Cooke staff were running the company and handling the insurance and shipping needs.

Immediately after the attack on Pearl Harbor, U.S. troops started to take over WAC acreage, "bulldozers, crawler cranes and trucks were taken out of the fields to build airfields" and WAC's manager was ordered to provide upwards of 500 men a day "to help build defense installations" (Taylor et al. 1976:197). Furthermore, "chunks of acreage were converted to potatoes and other vegetables that could help feed the military and local population" (ibid.:198).

In 1948 a holding company called Helemano Company, Ltd., was organized "to take over all of the assets of Waialua Agricultural Company other than the mill equipment and 200 acres of land around the mill" that included WAC's "interest in Hawaiian Pineapple Company and 27,000 acres of land, which produced substantial annual rental payments" (Taylor et al. 1976:225); thus splitting WAC's sugar profits from their pineapple profits and other investments. In 1958, Helemano Company, Ltd. merged with Castle & Cooke; and in 1961 merged with Dole, which resulted in Castle & Cooke becoming one of the largest landholders in Hawai'i.

In 1985, the newly formed Dole Food Company took over ownership and operations of WAC when Castle & Cooke merged with Flexi-Van Corporation under financier David Murdock (Dorrance and Morgan 2000:141). WAC was the very last commercial sugar plantation to close on O'ahu after their last harvest in October of 1996 (Dorrance and Morgan 2000:49). According to Dorrance and Morgan, as recently as 1999, "the former Waialua Plantation Company 'mill camp' could still be found behind the remains of the mill, largely occupied by Filipino workers and retirees" (2000:133).

The Pineapple Industry in Wahiawā (1880s-2019)

According to a 1933 University of Hawaii research publication titled *Land Utilization in the Hawaiian Islands*, eighty to eighty-five percent of the world's pineapple production originated in Hawai'i at that time; "Hawaii is the pineapple's paradise, for here it thrives best and attains that sweetness and lusciousness of flavor not present in the pineapples grown in other lands" (Coulter 1933:88). The first pineapple venture was initiated by English Captain John Kidwell and his friend John Emmeleuth, on 140 acres of leased land near Pearl Harbor during the 1880s (Taylor et al. 1976:163). By 1892, Kidwell had 100,000 plants and organized the Hawaiian Fruit and Packing Company; however, the neighboring Ewa Sugar Plantation's management persuaded Kidwell to switch to sugar cane—a venture that failed and allowed for Ewa plantation to take back the land (Taylor et al. 1976).

Pineapple cultivation was originally brought to the project area vicinity by Byron O. Clark, who owned roughly 200 acres in Wahiawā (Dole and Porteus 1990:25) and had found some discarded pineapple plants near Kidwell's abandoned farm and took them home to Wahiawā, where he planted them in rows (Taylor et al. 1976). Thus, Clark was able to prove that pineapple is a rather hardy and adaptable fruit, "raised at sea level, at an altitude of 3,000 feet, in soils with much potash, in soils with little potash, in semi-arid areas without irrigation, and in areas having a rainfall of 60 inches" (Coulter 1933:89). However, most pineapple cultivation on O'ahu was located at elevations between 500 and 1,000 feet above sea level (Coulter 1933). Since his arrival in 1897, Clark had been the Commissioner of Agriculture and had formed an agricultural cooperative called the Hawaiian Fruit and Plant Company; Clark and twelve other families from Southern California established the "Wahiawa Colony Tract" on 1,300 acres of Government Land in Wahiawā as homesteaders under the Land Act of 1895 (Dole and Porteus 1990). The Wahiawā Colony was located to the southwest of the current project area and today comprises the residential area between California Avenue and Kaliponi Street in Wahiawā Town.

In 1902, Clark organized the Tropic Fruit Co., which grew and packed pineapples in glass jars; in 1906, Tropic Fruit Co. merged with the Hawaiian Fruit and Plant Company to create Consolidated Pineapple Co. under Leonard Kellogg, another Wahiawā homesteader (Hawkins 2011:19). However, "the credit for the foundation of the modern Hawaiian pineapple canning industry lies with James D. Dole" (Hawkins 2011:19). James Drummond Dole who would become known as "the Pineapple King" arrived in O'ahu in November of 1899. During his first few months in Hawai'i, he remained without a job and chose instead to invest in Ewa Plantation and WAC; he soon sold his Ewa Plantation shares and reinvested his gains in WAC (Dole and Porteus 1990:25). With annexation pending, a 61-acre tract of Wahiawā homestead land went up for public auction in 1900. Dole acquired the land and planted pineapple and vegetables; by 1901, when pineapple flourished, he organized the Hawaiian Pineapple Company (Taylor et al. 1976). At the time of the purchase, Dole's land "was covered with wild grass and guava bushes with no improvements whatsoever on it" and "he could see the ocean on both the Honolulu and Waialua sides of the island" because there were no trees (Dole and Porteus 1990:28). Shortly after acquiring the homestead land, Dole leased an additional 300 acres of Dowsett Estate land at Wahiawā from Walter F Dillingham, Frank Dillingham's son (Hawkins 2011).

The initial pineapple harvests had been intended for sale in the fresh market, but fresh pineapples could not be shipped over long distances without spoiling. As a result, Dole concentrated on canning as a means of making pineapple available and profitable year-round. Thus, Hawaiian Pineapple Company or HAPCo became dedicated to the production and canning of the fruit for export (Coulter 1933). In 1903, Dole entered an exclusive contract with Hunt Brothers Packing Co. as the sole distributor of HAPCo's product and they, in turn, supplied HAPCo with cans from the American Can Co.'s San Francisco plant (Hawkins 2011). Soon, Dole built his first cannery at Wahiawā with hand-operated equipment, as well as a stable and laborers' quarters adjacent to it (Dole and Porteus 1990). In 1903, Dole's first pack comprised 1,893 cases of canned pineapple, which were hauled to Honolulu using horse-drawn wagons; a year later, the pack increased to 8,810 cases (Taylor et al. 1967:164). By the end of 1904, Dole and his investors decided to expand the pineapple planting operation and upgrade the small Wahiawā cannery (Hawkins 2011).

Beginning in November of 1903, Dole and Dillingham were in communication about laying rail between Wahiawā and Honolulu for the shipping of pineapple; around the same time, General Arthur MacArthur was considering an area within the Leilehua Plain as the location of a camp for 1,500 soldiers, which would become Schofield Barracks (Yardley 1981). In 1905, Dillingham decided to build the Wahiawā branch of the O. R. and L. between the Waipahu mill site and Wahiawā Town, which required ten miles of rail extended across an elevation change of 923 feet (Yardley 1981:282). Per Yardley, "The branch opened in the middle of 1906 and proved an instant success as the pineapple business boomed beyond all expectations" for "the line produced as much traffic as had been estimated for the first year" within the first six months of operation (ibid.).

The 1906 Report of the Governor of Hawaii states,

> recently a branch of the Oahu Railway, 9 miles in length, has been extended up the bed of a gulch, over the plains, to Wahiawa for the benefit of the pineapple industry. The largest single area devoted to this fruit in the Territory is found at that place. . . . Organizing as companies under the general incorporation act they established factories for preserving the fruit, one of which has been removed to spacious premises at the Honolulu Railway terminus, where a factory has also been erected for making the cans. (Governor 1906:66)

As mentioned in the Governor's report excerpt above, in 1907, Dole demolished the Wahiawā cannery, relocated the equipment to Honolulu, and "persuaded American Can Company to build a plant next to his cannery so that he could save the freight costs of shipping preformed cans from the mainland" (Taylor et al. 1976:164). The new cannery located in Iwilei was also closer to shipping routes and the harbor.

The soldiers at the newly established Schofield Barracks dubbed the rail line the "Pineapple Limited," which they used to transport troops to Honolulu Harbor as well as freight (Yardley 1981). In 1908, the O. R. and L. hooked up with the naval railway and constructed branches that extended off the Wahiawā line to reach pineapple fields in Waipiʻo, Schofield Barracks, Kunia, and Halemano (Yardley 1981). The completed railway is shown in Figure 12 above.

Also in 1908, in response to the United States financial crisis known as the Panic of 1907, Dole and another eight Hawaiʻi based pineapple canners united to found the Hawaiian Pineapple Growers' Association (HPGA) with Dole as president (Hawkins 2011). Their objective was to increase consumption of pineapple across the continental United States. To that end, HPGA mounted an aggressive advertising campaign that glorified the island fruit and included promotional materials; soon the North American and European demand for canned pineapple drove the industry forward. In addition to the large-scale commercial producers, small-scale farmers also grew pineapples and sold them to the canneries (Hawkins 2011). By 1908, the island of Oʻahu boasted 79.2 percent of the total land area planted in pineapple across the main Hawaiian Islands (Hawkins 2011:117). According to Coulter, around 1910:

> There was no lack of land apparently suitable for raising the fruit. Scarcely any competition for the same land existed between pineapple planters and sugar cane planters. Some areas newly devoted to pineapples were hitherto used for raising cattle; others were formerly used for sisal. Thousands of acres of pasture were still available for the more profitable use of pineapple culture. (1933:92)

Plantation workers usually harvested pineapples from June to September, a period which coincided with the off-season for sugar cultivation (Coulter 1933). Thus, plantation laborers often migrated from one crop to the other and one plantation to the other, depending on the season. Japanese and Filipino men made up most of the pineapple labor force in the fields, while women, boys, and girls worked the canneries (Coulter 1933; Hawkins 2011). On some plantations, harvesting activities were carried out around the clock with laborers working through the night (Dole and Porteus 2001). The 1911 development of the Ginaca machine revolutionized pineapple canning. This machine "could

size, peel, core, and cut the ends from the fruit and deliver perfect hollowed cylinders to the packing table at speeds of 80 to 100 pineapples per minute" (Taylor et al. 1976:164).Other contributions to the success of the pineapple industry included Dole Plantation manager John Whitmore's discovery (around 1915) that mulch paper could be utilized in pineapple cultivation, as well as the establishment of an experiment station at Wahiawā in 1922 (Coulter 1933; Dole and Porteus 2001).

During World War I, HAPCo felt the strain of staff reductions because so many men volunteered for the war effort (Butler 2001). At the same time, the federal government requisitioned sixty percent of the Hawaiian pineapple industry's 1917 winter pack and much of the 1918 summer pack (Hawkins 2011). After the war, demand in the United States and Britain remained strong (Dole and Porteus 2001). Even with some setbacks, such as over-productive years in which the industry suffered a loss because the market could not keep up, the pineapple industry continued to expand until the 1930s. In 1923, HAPCo purchased the island of Lānaʻi using funds secured from WAC, which added 15,000 acres of land suitable for pineapple, which bore its first harvest in 1926 (Butler 2001). Beginning in 1927, HAPCo started to focus on the Dole name in their advertisements and stamped "DOLE" on the top of each can (Dole and Porteus 2001). By 1928, there were thirteen pineapple companies and eleven canneries across the islands, all of which were competing for dominance of the seller's market (Coulter 1933). In their 1931 annual report, HAPCo reported a record output of 4.9 million cases (Dole and Porteus 2001:93).

A comparison of the land utilization maps from 1906 and 1930 reveals a striking contrast in the amount of land used for pineapple cultivation, which was significantly greater in 1930 (Figure 14). The largest pineapple farming area is clearly depicted within Wahiawā in 1906, while the 1930 map shows more widespread plantings of pineapple (see Figure 14). In 1932, of all the Hawaiian Islands, O'ahu had the largest percentage of land area in cultivation: 21.63 percent; of which, 42.45 percent was dedicated to pineapple, while 51.86 percent was planted in sugarcane, and 5.69 in other crops (Coulter 1933:53). Coulter provides the following description of some of the land areas set aside for pineapple cultivation that "were not equally suited to raising that crop" during the early 1930s:

> On the island of Oahu some of them were in scattered locations on the leeward side of the rain forest, difficult of access, where the soil was thin and pests numerous and active. They could only by a stretch of the imagination be classed as arable land. Nearly all such land has now been abandoned. Some of it will probably remain waste land. Part of it may be afforested. (1933:98)

Despite the increased acreage in pineapple on Oʻahu, when the depression struck the mainland housewives stopped buying canned pineapple, which left Dole with a surplus in the fields and the canneries, along with mounting debts (Taylor et al. 1976). In response, HAPCo was reorganized in 1932 and Castle & Cooke took over the management of the company; by the late 1930s, HAPCo was back on track and turning a hefty profit (ibid.). The depression also spurred changes throughout the pineapple industry; in 1932, seven companies "entered into an agreement to limit production to the needs of the market, sell the combined pack through a marketing committee, and pool their advertising" (Coulter 1933:98).

During World War II, in addition to the disruptions of the labor force and equipment as previously mentioned in the WAC discussion, the U.S. military "requisitioned most of the canned fruit that the Hawaiian Pineapple and other companies produced" (Taylor et al. 1976:198). The O. R. and L. continued to flourish through the end of World War II and provided transport for millions of passengers and freight during the war proving itself indispensable to the U.S. Army and Navy. However, after the war as infrastructure improvements to Oʻahu roadways were implemented and a shift to automobiles, trucks, and buses for the transport of people and goods was underway, the O. R. and L. could not compete. The year 1947 marked the close of the main line while limited operations between the docks and pineapple canneries continued before complete abandonment of the railway a few years later.

By the 1950s, HAPCo had changed its name to Dole and had merged with Bumble Bee, formerly Columbia River Packers (CRP), into Castle & Cooke, which turned the Hawaiian business into "an important segment of the American food industry, in addition to its interests in shipping, stevedoring, and merchandising" (Taylor et al. 1976:237). The formation of the subsidiary Oceanic Properties soon followed, which managed and developed Castle & Cooke's 155,000 acres spread across the Hawaiian Islands. On Oʻahu, Castle & Cooke had land holdings that consisted of "42,000 acres (almost half in sugar and pineapple), plus property in the business, industrial, and waterfront sections of Honolulu" (ibid.). At this time, sales of sliced pineapple and pineapple juice (canned and frozen) reached their peak.

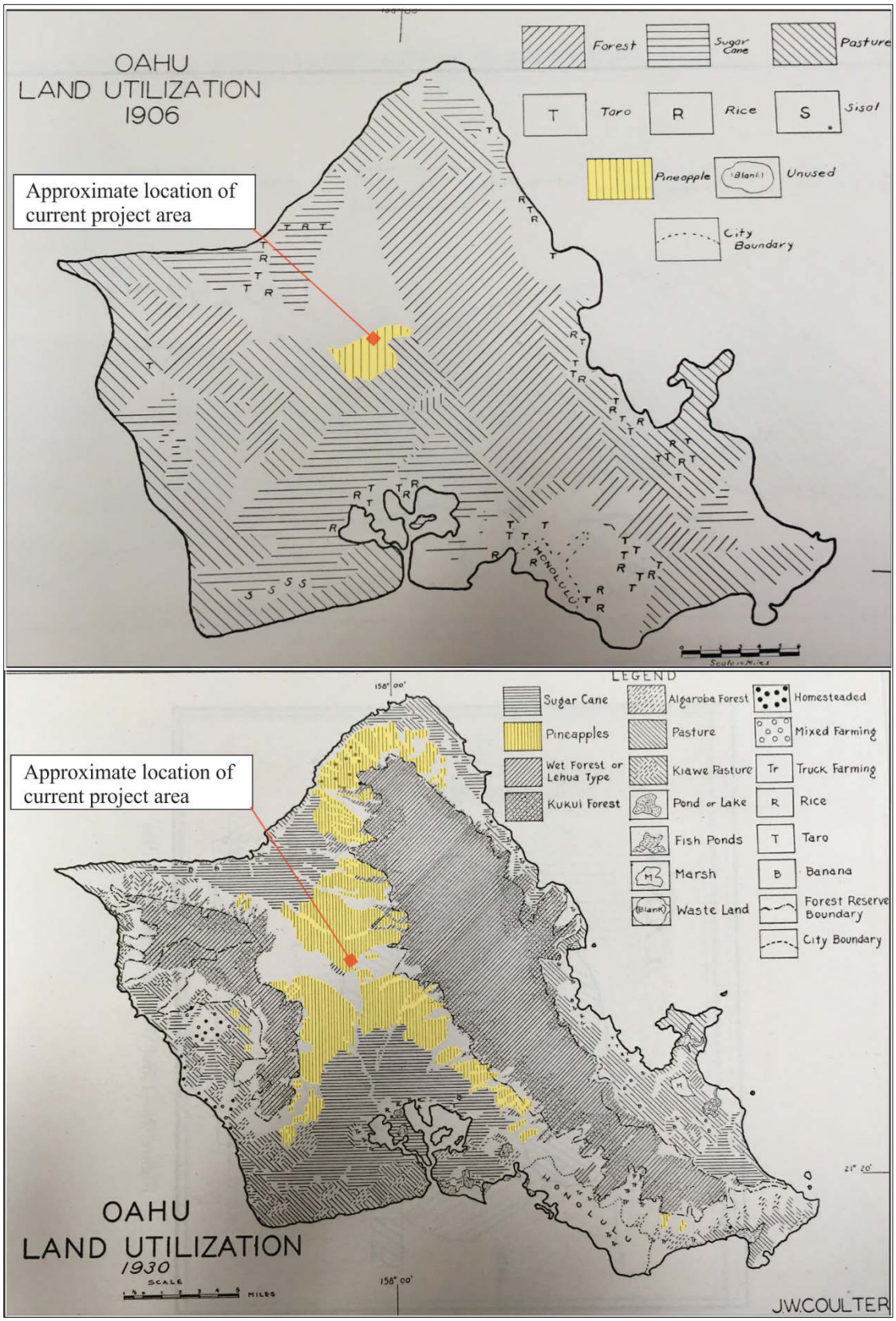


Figure 14. Land utilization maps of O‘ahu in 1906 (top) and 1930 (bottom) showing pineapple lands shaded yellow. In the 1960s, Hawaiian pineapple growers supplied more than 80 percent of the world’s

output of canned pineapple; however, pineapple production had begun to decline by 1966 and many of the fields formerly dedicated to pineapple production were retired (Gomes 2009). During the 1970s, Dole reduced pineapple production in Wahiawā as the canned produce became less profitable and a shift to fresh fruit production was underway (Bartholomew et al. 2012). Dole continued to grow fresh pineapple on O‘ahu, “primarily for the Oahu and tourist markets. . . ” and “to keep lands owned by Maui Land Pineapple Company and Dole Food Company in agriculture to take advantage of the favorable tax base such lands enjoy” (Bartholomew et al. 2012:1397). This shift is evident in a comparison of two aerial photographs taken as part of the United States Geological Survey in 1962 and 1977 (Figure 15). The surrounding acreage excepting residentially developed areas, as well as the central portion of the project area are clearly planted in pineapple as depicted in the 1962 image; in contrast, the 1997 image shows less pineapple plantings in the surrounding area and and buildings within the central portion the project area where pineapple formerly appeared (see Figure 15).

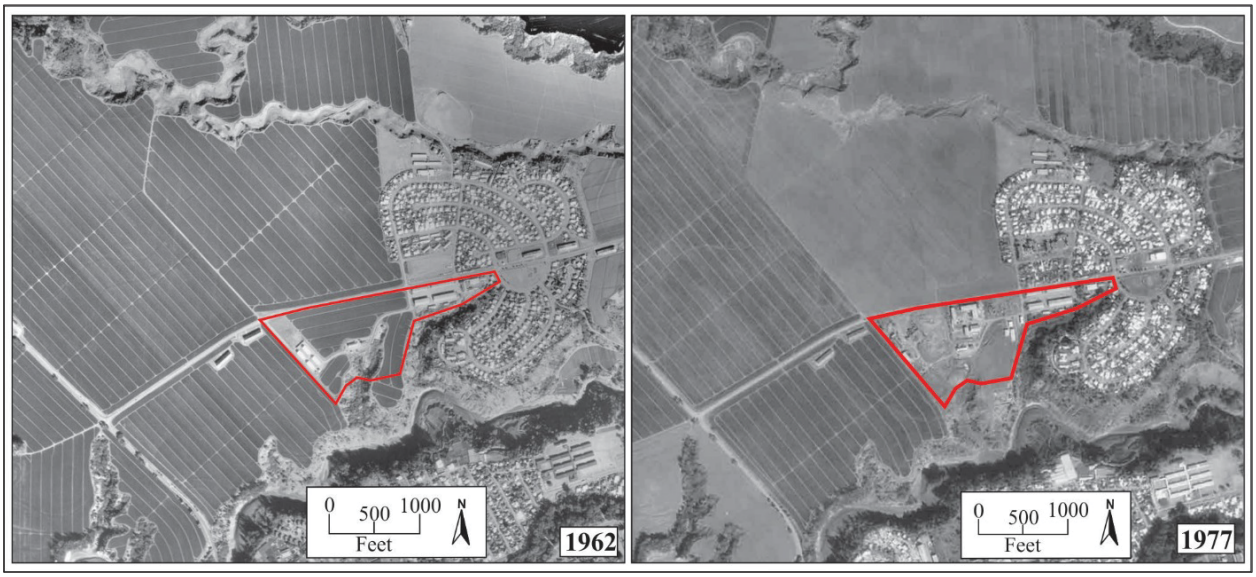


Figure 15. Comparison of 1962 and 1977 USGS aerial photographs showing project area outlined in red.

In late 1982, it appears that heptachlor epoxide was used to control ants in the pineapple fields and the tops of treated pineapple were used as cattle feed (green chop) for milk cows, which had a devastating effect on the health of the population of O‘ahu and the local dairy industry (Turner 1982). This unfortunate series of events is known as the heptachlor-tainted milk scare. Per a document titled History of Agriculture in Hawaii prepared by the Hawai‘i Department of Agriculture (1999), in 1983, Del Monte Corp. closed its Hawai‘i pineapple canning operations, but by 1984 had opened a new Hawaiian pineapple juice concentrate plant in Kunia (HDOA 1999). In 1992, Dole Packaged Foods Company closed its Lāna‘i Plantation and its Iwilei Cannery (HDOA 1999). However, since 1989, a former fruit stand on Kamehameha Highway, to the north of the current project area, has been operating as a tourist destination known as Dole Plantation (Dole and Porteus 1990). Dole continues to grow fresh pineapples in the vicinity of this tourist attraction primarily for the tourist and local O‘ahu markets with a small percentage of the harvest shipped to the mainland when shortages occur in Dole’s Central American supply (Bartholomew et al. 2012). Today, Dole Food Company is one of the last vestiges of the Hawaiian pineapple industry, which suffered a sharp decline since the 1970s. Bartholomew et al. attributes the demise of the pineapple industry in Hawaii to the relocation of production to developing countries with lower labor costs, as well as cheaper land and water combined with the post-World War II tariff reductions by developed countries (2001:1397).

By 2007, foreign based canneries out-competed Hawaiian production and all the pineapple grown on O‘ahu was grown for the fresh market (Bartholomew et al., 2012). According to the report titled Development of a Master Plan for the Whitmore Agricultural Project prepared by the University of Arkansas (UARC 2017), the Dole Food Company was no longer utilizing approximately 280 acres of the Dole plantation. In 2013 and 2014, the Agribusiness Development Corporation (ADC) of Hawai‘i purchased the Dole Plantation land, and the remaining 24 acres of land owned by Castle & Cooke as the foundation for the proposed Whitmore Village Agricultural Development Project, or

Whitmore Project, which necessitated the preparation of the current document.

The Legacy of John Lawler Whitmore

Whitmore Village was named in memory of John Lawler Whitmore (Figure 16), a pineapple pioneer who worked over three decades at HAPCo. Much of the following discussion is drawn from his biography, which was penned by his daughter Gladys Butler based on her memories and correspondence her father wrote and received while he resided in Wahiawā (Butler 2001). Born in Southwest Harbor, Maine on September 2, 1879, John Whitmore was twenty-two years old and working in his uncle Allen Lawler's clam cannery in his hometown when James Dole asked Lawler to join him in Wahiawā to partake in his new pineapple venture (Butler 2001:62). Lawler declined and suggested that Dole ask his young nephew instead; by that time, John had already attended business school and had experience running the clam cannery. Whitmore arrived in Honolulu on December 3, 1902. By early January 1903, he was settled in at Wahiawā and in November of 1903, he became director of HAPCo. Butler states that her father became plantation manager while the cannery was still operating at Wahiawā (ca. 1903-1906). During those early days Whitmore wrote home regularly and reported on everything from his health and the weather to their progress in the fields, which began with just 27 acres in February of 1903; and with the addition of leased and purchased lands swelled to over 15,000 acres by 1922. In a letter dated May 27, 1906 Whitmore tells of using "40 or 50 mules in the field every day making land soft for the mess of plants that are waiting to peep out from under the leaves of the plants that are fruiting" (ibid.:82).



Figure 16. John Lawler Whitmore in pineapple fields, ca. 1910. In 1910, Whitmore married Edna Thompson and they lived "right next door to the Hawaiian Pineapple Company's Wahiawa office" on Kilani Avenue, to the southwest of the project area; but by 1915, when they welcomed their second child, they were living on Alameda Avenue in Honolulu. As previously mentioned, by this time the cannery was in full swing in Honolulu with a branch of the O. R. and L. connecting it to the plantation. In order for Whitmore to manage the plantation, he had "to travel on horseback or in his first Ford (see Figure 16) through the muddy gulches and through the fields on roads which hadn't improved much" thus, "he often went to Wahiawa on the train and rode horseback around the plantation" (ibid.:105). Whitmore moved his family back to their Wahiawā house by January of 1918, when baby Gladys was born. Whitmore was a tireless and dedicated worker as evidenced by the fact that in August of 1918, Whitmore's physician ordered him to take a vacation and Jim Dole strongly encouraged the same, for Whitmore had not returned to Maine in over four years.

Beginning in late 1922, Whitmore took part in securing the purchase of Lāna'i to expand HAPCo's pineapple acreage and he oversaw the development of infrastructure to support the new venture. As a result, Whitmore's responsibilities increased exponentially, for he was managing not just the Wahiawā acreage but also had to make frequent visits to Lāna'i. As previously mentioned, Whitmore was the first to recognize the advantages of utilizing mulching paper for weed suppression in pineapple cultivation, which resulted in much higher yields because with the paper in place, new plantings started more quickly and developed faster (Hawkins 2011). By the 1930s, the use of paper mulch for pineapple crops was widespread across the industry, beyond HAPCo (Hawkins 2011:101). John Whitmore passed away in 1933 at the age of 53 at Queen's hospital after a brief illness. One of his obituaries mentions that he was also a director of the Bishop Trust Company. Upon hearing of his dear friend and business partner's death, Jim Dole (Figure 17) wrote the following sentiments in a letter to Whitmore's mother:

> . . . I have always relied on John a great deal for advice and counsel and I don't think I yet appreciate how much I shall miss the opportunity of always going to him with my problems and troubles. . . no man ever had a better or truer friend than I had in John. And God never made a better man.
>
> No man ever had a better, cleaner record. I am proud that I was his friend and you can well be proud of being his mother. John is going to be tremendously missed by the company and by his friends and relations. . . (Butler 2001 Letter May 5, 1933)



Figure 17. Jim Dole (right) and John Whitmore (left) in the Wahiawā pineapple fields (Butler 2001).

In 1947, a residential development for HAPCo Plantation employees was developed on seventy-seven acres of land located north of Wahiawā Town, which would become Whitmore Village—named after John Lawler Whitmore. Prior to this undertaking, HAPCo employees had been residing in thirteen plantation camps scattered across HAPCo's acreage. These camps had names like Brodie 1 and 2, Pine Spur, Kipapa, Kemoo, Robinson 1 and 2, Halemano, Kaukonahua, Waialua, and 'Ōpae'ula. Only one camp known as Waimea Camp was not included in the consolidation and remained a separate entity. Butler cites an article from the October 1950 issue of *Paradise of the Pacific* magazine as follows:

> "All lands for WHITMORE [Figure 18], totaling 388 acres located on both sides of the highway leading to the naval radio station Mauka of Kamehameha Highway, have been acquired in fee simple by the company, and street and general layout plans have been completed." (2001:140)

According to Butler, some of the plantation camp houses were relocated to Whitmore Village while others were new constructions. The Whitmore Village residences had improvements such as indoor plumbing, hot water, and electricity, as well as lawns and gardens, unlike the housing in the plantation camps. Another improvement to the community was the paved roads including Whitmore Avenue and several streets to the south as depicted on Map 001 of Land Court Application (LCApp.) 1562, reproduced as Figure 19 below. Also depicted on this map is the project area situated within a portion of Lot B of Grant No. 973 "transferred to Hawaiian Pineapple Company, Ltd., from James Robinson, Robert Lawrence, and Robert W. Holt" (see Figure 19).

Butler also reports that in 1953, HAPCo employees were afforded the opportunity to purchase their homes and the lots they lived on. Butler visited Whitmore Village in 1985 and residents spoke to her about their need for land on which to grow things; a concern that remains for some Whitmore Village residents to this day and will be discussed in the consultation chapter of this document.

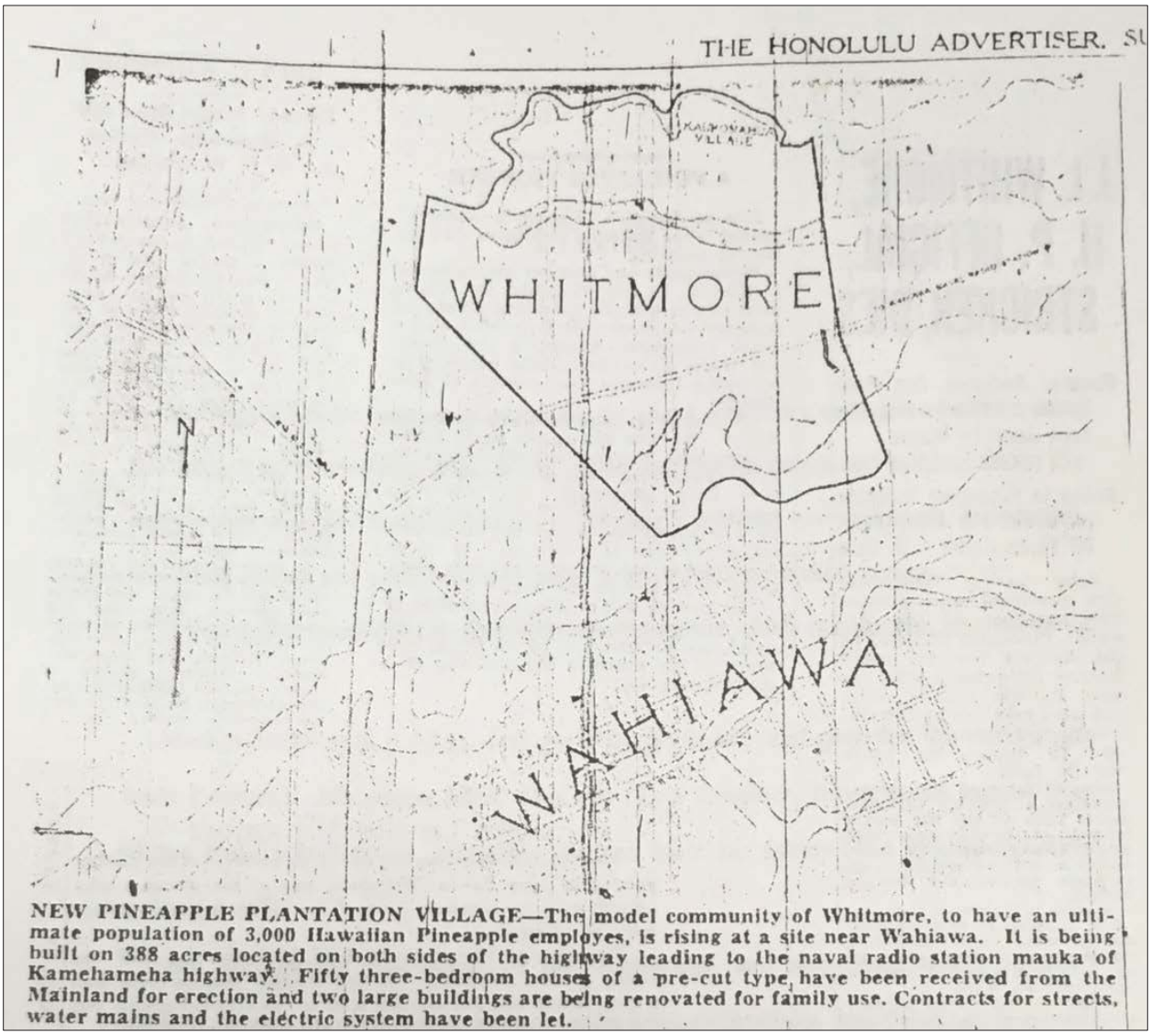


Figure 18. Portion of *Honolulu Advertiser* article showing plan for Whitmore Village (Butler 2001:143).

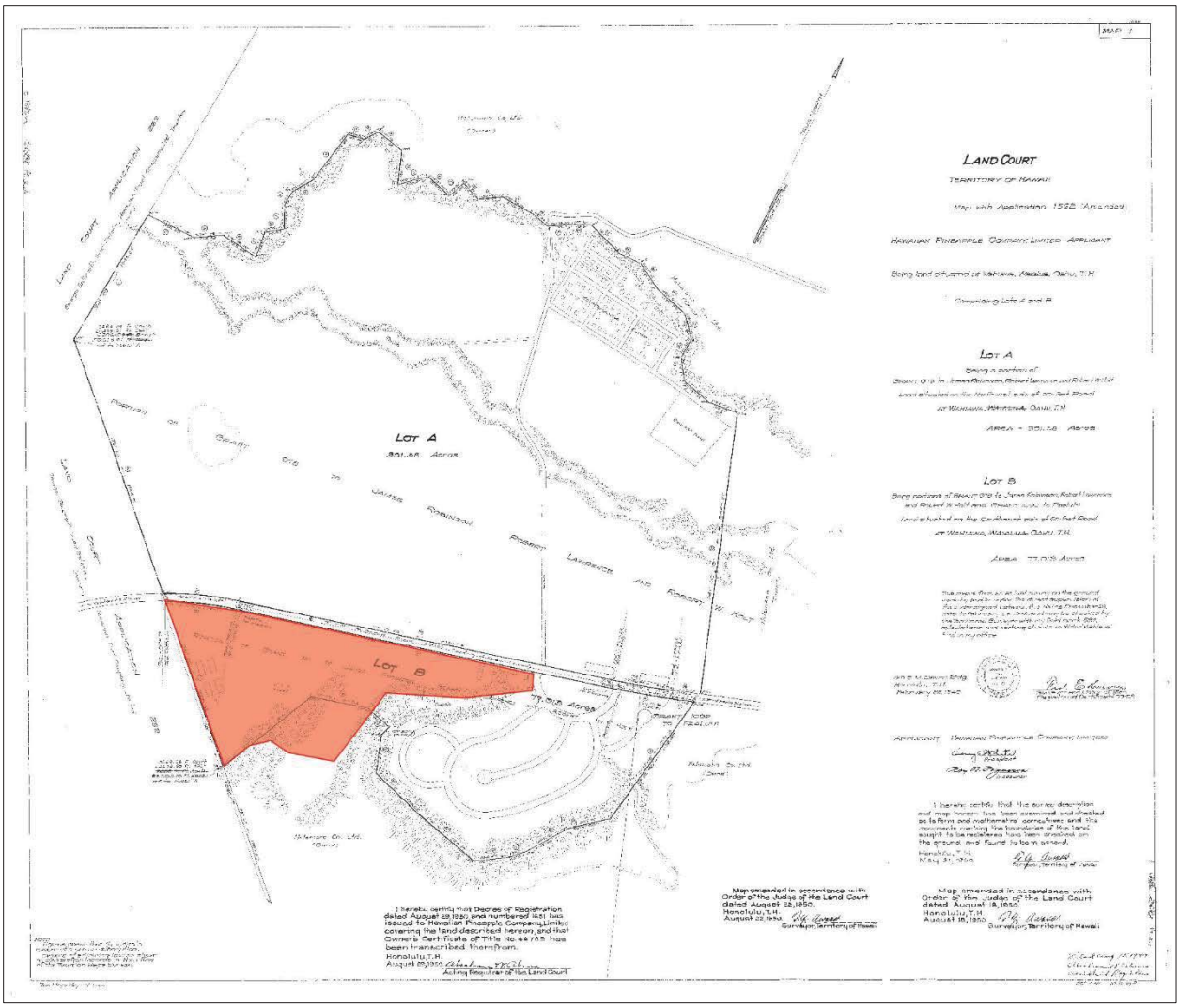


Figure 19. Map 001 of LCApp. 1562 showing the project area shaded red, ca. 1946.

The Project Area Since 1946

Map 001 of LCApp. 1562 depicts two clusters of structures; one near the western boundary and the other near the eastern boundary of the project area, as well as a single rectangular structure in the central western portion of the project area (Figure 20). Four rectangular structures of the same size, arranged as two parallel pairs, are present near the western boundary; while the cluster at the far east end of the project area comprises six structures of varying size and shape (see Figure 20). Also depicted on this map is a reference to the aforementioned Helemano Co. as owner of the land to the south of the project area (see Figure 20, yellow highlight).

The Sanborn Fire Insurance Company Maps index for the town of Wahiawā dated 1942–1957 indicates that Sheet 8 (Figure 21), dated July 1957, "includes additional territory formerly unmapped," which suggests that the structures and streets of Whitmore Village were constructed prior to 1957. On this map, Whitmore Village extends north and south of Whitmore Avenue and includes the eastern portion of the project area. Within the northeastern portion of the project area is a grouping of four large rectangular structures arranged parallel to Whitmore Avenue and labeled "TRUCK & AUTO. GARAGES," along with three oddly shaped structures of varying size and orientation labeled "OFF." located to the east of the garages, as well as a smaller rectangular structure labeled "HALL" that appear to pertain to HAPCo (see Figure 21). The four "TRUCK & AUTO. GARAGES," the three "OFF" Buildings, and the "HALL" are visible in both the 1962 and 1977 aerial photographs in addition to two rectangular storage sheds to the south of the garages (see Figure 15); all of which remain extant (see Figure 3).

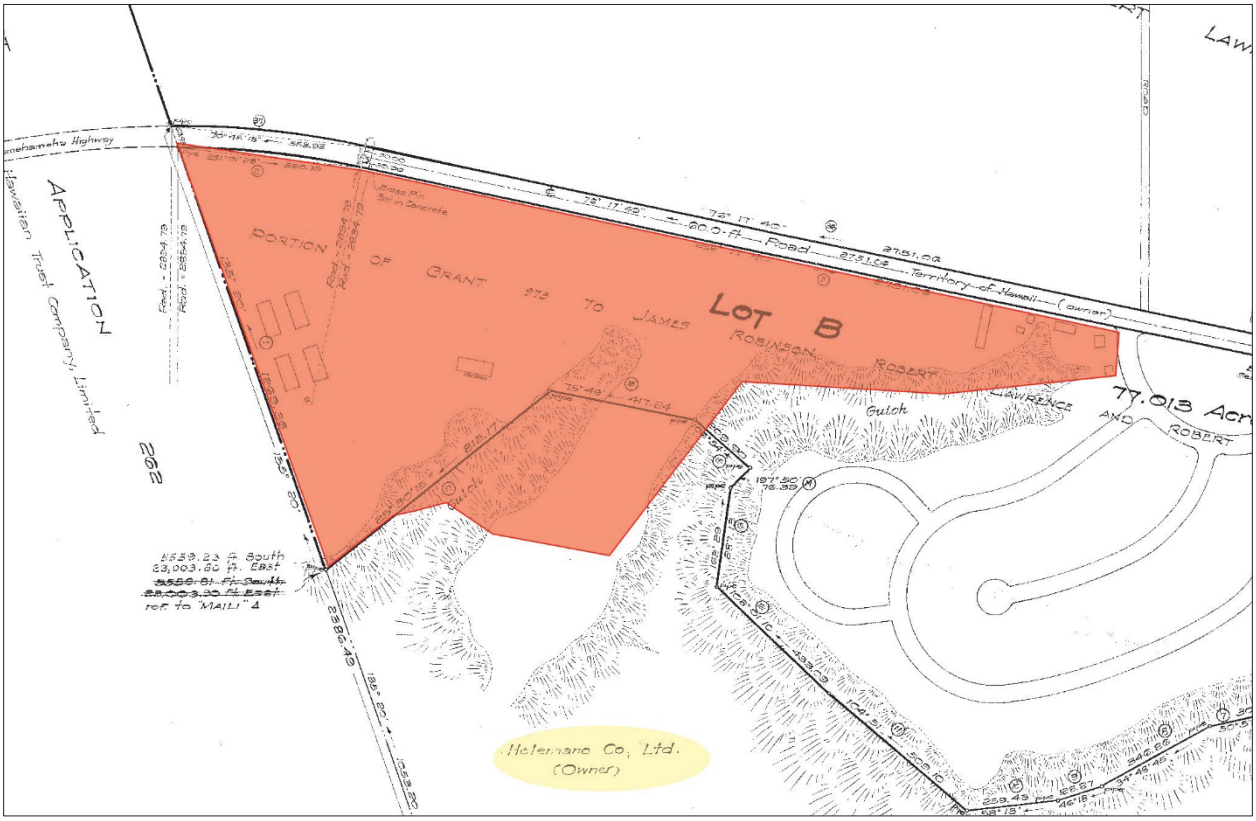


Figure 20. Detail view of Map 001 of LCApp. 1562 showing structures within the project area (shaded red).

The most recent use of the project area has been as a maintenance yard and office space for the Dole Company. Currently, some of the buildings within the project area are being leased by independent companies; while the remainder of the buildings appear to be unused. Background research indicates that the study area housed buildings and structures of the former Dole Company Operations Facility at Whitmore Village. Most of these structures are utilitarian and served as machine shops, warehouses, storage, greenhouses, and other functions associated with a maintenance yard. Three buildings, located at the east end of the property, housed offices, meeting rooms, and clubhouses intended to serve the administrative, recreational, and research needs of the company and its employees.

In sum, the project area vicinity was an important region in the Precontact Period, being traditionally associated with royalty and recognized as the sacred birthplace of several important chiefs. However, during the Historic Period a major transformation of the land occurred, which began with the large-scale harvesting of native Sandalwood forests for export; and continued with the development of the O. R. and L. railroad and the commercial cultivation of sugar and pineapple, as well as the development of United States military installations. These activities had a devastating and lasting impact not only on the landscape but also the local population and Hawaiian culture.

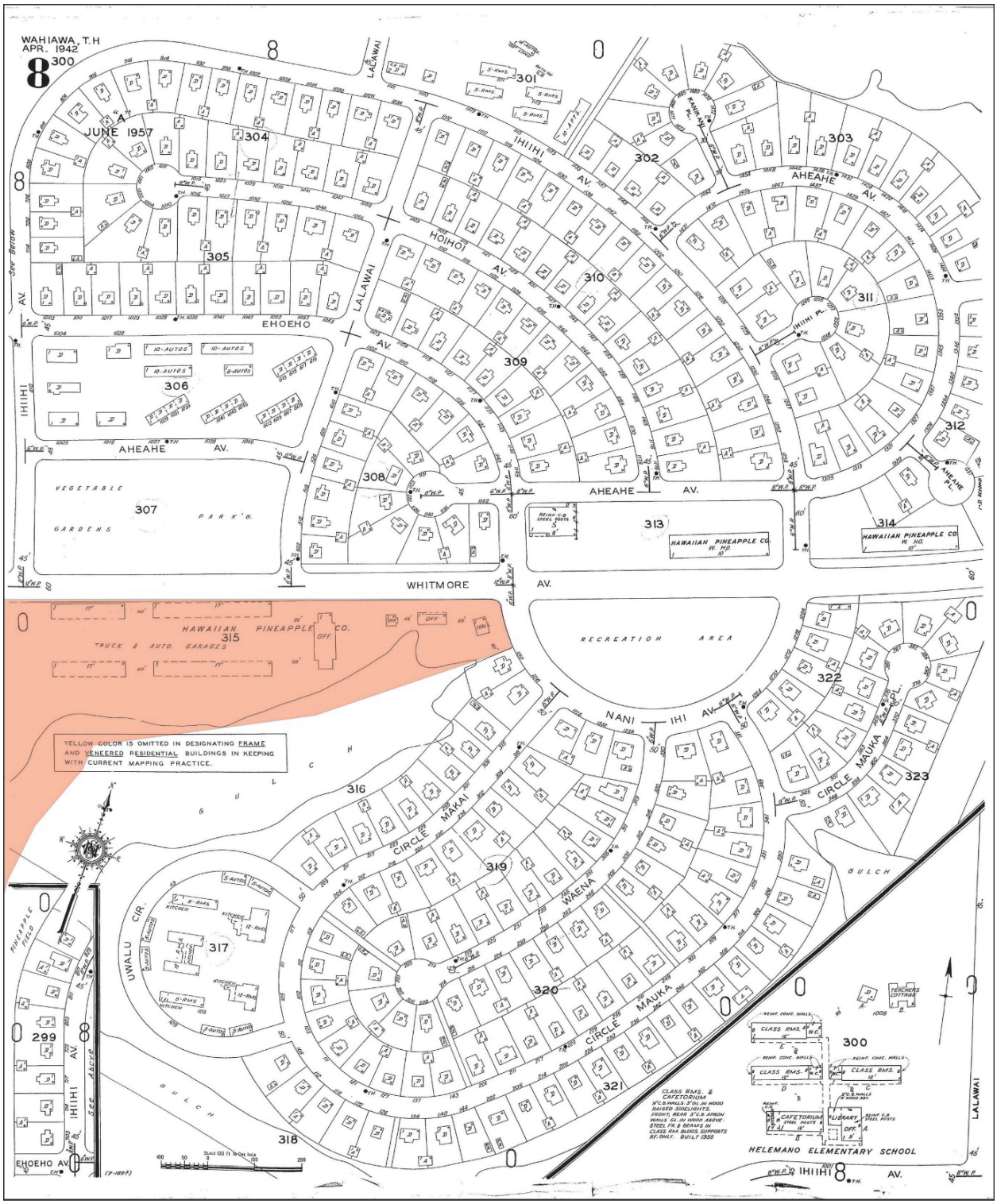


Figure 21. Sanborn Fire Insurance map of Whitmore Village with the eastern portion of the project area shaded red, ca. 1957.

PRIOR STUDIES

The earliest archaeological study conducted in the vicinity of the current project area is that of Thomas G. Thrum, who created a list of the *heiau* of ancient Hawai'i in the early 1900s. Thrum (1906a:36-48) published his list of *heiau* in a series of entries in the *Hawaiian Almanac and Annual*, beginning with the 1907 edition. Thrum made the following remarks about his investigations in a preliminary paper titled "Tales from the Temples" (1906b:49-69) published in the 1907 annual:

> This much is being realized, and expressions of regret have been freely made, that we are at least fifty years too late in entering upon these investigations for a complete knowledge of the matter, for there are no natives now living that have more than hear-say information on the subject, not a little of which proves conflicting if not contradictory . . . While these difficulties may delay the result of our study of the subject, there is nevertheless much material of deep interest attending the search and listing of the temples of these islands that warrants a record thereof for reference and preservation. (1906b:49-50)

Thrum and his associates compiled information on over seventy *heiau* located throughout O'ahu (Thrum 1906a). One must take into consideration that Thrum listed *heiau* that had already been destroyed prior to his data collection efforts in the early 1900s. Thrum listed the following *heiau*, located in Waialua within ten miles of the project area:

> Onehana……On slope at rear of Waialua Agr. Co.'s mill: a partly walled and platform heiau about 60x100 feet in size; of pookanaka class.
>
> Kalakiki……On ridge north of Onehana, of pookanaka class; its walls covered in a tangle of hau and lantana.
>
> Hekili……At Palaa-uka [Pa'ala'a], near the twin bridge, below the road; of luakini class and place of refuge; long since destroyed.
>
> Lonoakeahu……Keehu.—A heiau of small size destroyed years ago; site now planted to cane.
>
> Kapukapuakea……Palaa-kai [Pa'ala'a].—A medium sized heiau of traditional Menehune construction of kauila wood, long since destroyed, said to have worked in connection with Lonoakeahu. Luuau its kahuna. (1906a:47-48)

Onehana and Kalakiki were both located along the slopes of Ka'ala and Thrum further reports

> Not only is the beating of drums and sound of the conch shell and gourd rattles heard in the nights of Kane in its precincts, but its influence extends to the shore and sea at its front, for torch-lights at times suddenly appear and dance about within its range, or vanish at one's approach. . . A still further superstition is that a house built within the range from the temple to its deity must not have its doorway face the hills, else trouble, sickness and death to the household is sure to follow. (1906b:52, 54)

Thrum also mentions that Kapukapuakea Heiau at Waialua (in Pa'ala'a) was one of two instances in which *heiau* "were described as having been of stick fence construction" (Thrum 1906b:51). He continues, "its kahuna, Luuau, is said to have foretold the wane of the alii Kahele's power, through the displeasure of the gods at his irreligious acts" (ibid.:54). Thrum also discusses the former location of Kupopolo Heiau on the southside of Waimea Bay, as well as Pu'u o Mahuka Heiau, which still overlooks Waimea Bay in Pupukea, about ten miles northwest of the project area.

The earliest formal archaeological survey of O'ahu was conducted by J. Gilbert McAllister on behalf of the Bishop Museum during nine months in 1930. McAllister's purpose was "to collect information regarding the archaeology of Oahu" (McAllister 1933:3) and he made it clear that his investigation was a beginning rather than a complete account of all the cultural resources on O'ahu. McAllister also made the following statement regarding the state of cultural resources on Oahu at the time, in the introduction to his resultant publication *Archaeology of Oahu*:

> As the archaeological remains are those of the people found in Hawaii by the early voyagers, contact with Hawaiians was an indispensable part of the work. Not only are the sites being destroyed by the changes wrought by European culture, but with the introduction of exotic vegetation many sites have been completely hidden. Such remains would be as good as lost, were it not for the knowledge of them still treasured by old residents (*kamaaina*) of Oahu. With the passing of these old people most of this information will disappear. (ibid.)

McAllister describes two sites located approximately 1 kilometer west of the current project area (see Figure 5): the Kūkaniloko birthstones (Site 218) and the associated Hoolonopahu Heiau (Site 219). While Hoolonopahu Heiau

(SIHP Site 50-80-04-219) had been demolished by the time of McAllister's recording, Kūkaniloko was noted as being "the only ancient site on Oahu that is being officially preserved" (McAllister 1933:135). McAllister described the site as "an enclosed area about one-half acre in size, with many large stones, some just visible, others protruding to a height of 3 to 4 feet, scattered about on a well-kept lawn" (ibid.:13). According to tradition, the site was established in the 12th Century and was known to be the birthplace of several important *ali'i* (McAllister 1933). Kūkaniloko (SIHP Site 50-80-04-218) was listed in the National Register of Historic Places in 1973.

During the decades that followed McAllister's initial survey of O'ahu, no archaeological studies of Wahiawā Ahupua'a were produced. With the advent of Cultural Resource Management (CRM) in the 1970s, as a response to newly-established historic preservation laws and increased modern development, archaeologists began recording more discrete sites and performing test excavations throughout the state. Since the late 1980s however, multiple archaeological studies have been conducted in Wahiawā and some within the immediate vicinity of the current project area, the locations of which are presented in Figure 22 below.

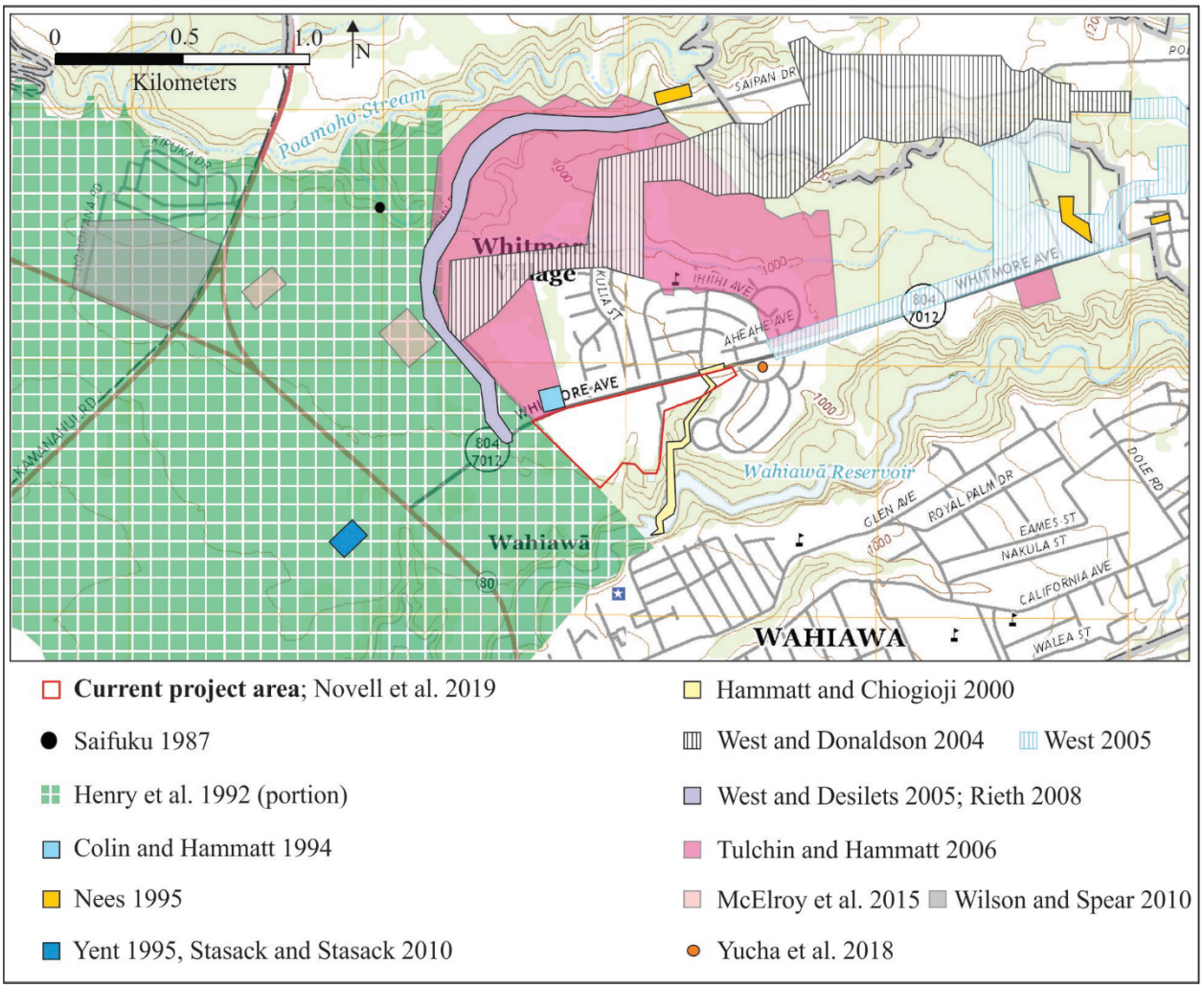


Figure 22. Locations of previous archaeological studies conducted in the project area vicinity.

In 1987, James Saifuku submitted to SHPD a map of the location of the Poamoho Heiau (SIHP Site 50-80-04-01605), drawn from his memory of the site as he observed it in the 1940s. Saifuku's map placed the *heiau* to the east of Kamehameha Highway and the "Pomoho [sic] Camp C.P.C.," approximately 1.5 kilometers northwest of the current project area (see Figure 22); a search of reports filed at the SHPD library produced his hand-drawn, unscaled map of a rectangular "heiau site" surrounded by pineapple fields (Saifuku 1987).

In 1992, Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an archaeological inventory survey (Henry et al. 1992) of Galbraith Trust Lands located immediately to the west and northwest of the current project area (see Figure 22). As a result of their investigation, PHRI identified a single historic property—a stacked stone wall (SIHP 50-80-04-4571), They also carried out thorough recording of the previously identified Kūkaniloko Birthstones site (SIHP 50-80-04-218). Although reportedly within their study area, Poamoho Heiau (SIHP 50-80-04-01605) was not relocated during the PHRI study.

In 1995, Martha Yent of Hawaii State Parks further documented the Kūkaniloko Birthstones (Yent 1995), following the 1992 acquisition of a 4.5-acre easement immediately surrounding the 0.5-acre historic property (see Figure 22). Yent recorded recent improvements to the site including the installation of a parking lot and didactic signage, grading and vegetation clearing to increase access and visibility from Kamehameha Highway, and the placement of physical barriers to deter vehicular traffic from entering the site. Yent also recorded modern petroglyphs, vandalism to boulders resulting from recent campfires, and subsequent repairs. In 2010, petroglyph specialists Edward and Diane Stasack revisited Kūkaniloko and made detailed maps and illustrations of the petroglyphs on the stones (Stasack and Stasack 2010); they also recorded modern graffiti (see Figure 22).

In 1994, Cultural Surveys Hawai‘i (CSH) performed an archaeological assessment (Colin and Hammatt 1994) immediately north of the current project area on the *mauka* side of Whitmore Avenue near the intersection with Saipan Drive (see Figure 22). No historic properties were identified as a result of their study.

Between 1995 and 2008, a series of studies were conducted and addenda prepared for the proposed Hawaii Regional Security Operations Center (HRSOC), Naval Computer and Telecommunications Area Master Station (NCTAMS) project located to the north and northeast of the current project area. In 1995, Ogden Environmental conducted an archaeological reconnaissance survey (Nees 1995) of three small, discontiguous study areas along Whitmore Avenue and Saipan Drive (see Figure 22). No historic properties were identified as a result of this first study. In 2004, another archaeological survey (West and Donaldson 2004) of an expanded study area for HRSOC, NCTAMS and an associated access road resulted in negative findings. Archaeological survey of additional locations for the proposed HRSOC NCTAMS resulted in the preparation of two addenda to the West and Donaldson (2004) report (West 2005 and West and Desilets 2005), which reported no historic properties within the expanded study area (see Figure 22). In 2008, International Archaeological Research Institute, Inc. conducted archaeological monitoring (Reith 2008) for the construction of the access road at HRSOC (see Figure 22). During the monitoring, heavily-disturbed soils were observed r, the result of decades of agricultural activities including tilling and plowing.

In 2000, CSH conducted an archaeological assessment (Hammatt and Chiogioji 2000) of a proposed water line between Whitmore Village and Wahiawā Town, which extended across a portion of the project area near the eastern extreme (see Figure 22). No historic properties were identified as a result of their study.

In 2006, CSH (Tulchin and Hammatt 2006) performed a literature review and field inspection of two separate parcels comprising 324 acres located north and east of the current project area (see Figure 22). One historic property was identified, a historic railroad trestle (CSH-1) to the northeast of Whitmore Villahe. The authors recommended an inventory-level archaeological study be conducted to further document the railroad trestle, which to date, has not been designated with a SIHP number.

In 2010, Scientific Consultant Services conducted an archaeological assessment (Wilson and Spear 2010) of approximately 34 acres of former agricultural lands to the north of the current project area (see Figure 22). During that study, a field survey and twenty-four mechanically-excavated test trenches did not encounter any historic properties, but demonstrated disturbed soils (up to 2.45 meters below ground surface) present throughout their project area, interpreted to be a result of agricultural tilling.

In 2015, Keala Pono Archaeological Consulting conducted an archaeological inventory survey (McElroy et al. 2015) on a portion of TMK: (1) 7-1-001:005, located northwest of the current project area (see Figure 22). Their study included a surface survey and subsurface archaeological testing in the form of eight mechanically-excavated trenches. No historic properties were identified during the project.

In 2018, CSH conducted an archaeological evaluation and drafted an Archaeological Monitoring Plan for the State DOD Emergency Siren Modernization Program at 14 locations throughout O‘ahu, including one proposed siren location in Whitmore Village, approximately 150 meters east of the current project area (see Figure 22). That study (Yucha et al. 2018) included background research, a review of previous archaeological studies and a surface survey of a 100-meter radius area from the proposed siren locations. No historic properties were identified during the study and no further archaeological work was recommended.

In 2018, ASM conducted a Historic Properties Inventory Survey (Novell et al. 2019), which coincides with the current project area. No archaeological sites were encountered as a result of the fieldwork. Extensive modifications of the land within the project area was noted during the survey, including prior mass grading and the presence of underground utilities, building footprints, paved and unpaved roads and parking areas, and active agricultural plots. ASM identified twenty-seven buildings, none of which are currently listed in either the National Register or the Hawai‘i Register of Historic Places, and none are currently recognized by the Historic Hawai‘i Foundation as historic properties. No previously designated local, state, or national historic districts are located within the boundaries of the property. Most of the buildings at the former Dole Company Operations Facility at Whitmore Village are utilitarian and served as machine shops, warehouses, storage, greenhouses, and other functions associated with a maintenance yard. Five buildings, located at the east end of the property, housed offices, meeting rooms, and clubhouses intended to serve the administrative, recreational, and research needs of employees and the company. Collectively, the buildings will be assigned a State Inventory of Historic Places (SIHP) Site designation. As the Novell et al. (2019) study sufficiently documented the site, no further mitigation work was the recommended treatment. Furthermore, because there were no archaeological resources identified as a result of the fieldwork, Novell et al. (2019) concluded that no further archaeological work need be conducted prior to, or during project implementation.

3. CONSULTATION

Gathering input from community members with genealogical ties and long-standing residency or relationships to the project area is vital to the process of assessing potential cultural impacts to resources, practices, and beliefs; for these individuals ascribe meaning and value to traditional resources and practices. Community members often possess traditional knowledge and a level of understanding that is unavailable elsewhere in the historical or cultural record of a place. As stated in the OEQC Guidelines for Assessing Cultural Impacts, the goal of the oral interview process is to identify potential cultural resources, practices, and beliefs associated with the affected project area. It is the present authors' further contention that the oral interviews should also be used to augment the process of assessing the significance of any identified traditional cultural properties. Thus, it is the researcher's responsibility to use the gathered information to identify and describe potential cultural impacts and propose appropriate mitigation as necessary.

As part of the current investigation the primary author was able to secure interviews with Joe Francher, Thomas Lenchanko, and Winona Aguirre (Auntie Nona). Jo-Lin Lenchanko Kalimapau, Historian and Treasurer of the Hawaiian Civic Club of Wahiawā, facilitated the interview with Auntie Nona; and forwarded a request for information, prepared by the primary author and approved by her, to each of the Civic Club members (eighty in all) via email around January 23, 2019 (Appendix A). Ms. Kalimapau herself did not choose to go on record for the current project but did approve the inclusion of her following statement:

> We, the Hawaiian Civic Club of Wahiawā, individually and collectively, perpetuate these most important teachings from our *kūpuna ma* of Kūkaniloko, those of Kūkaniloko who have gone before us whom we choose to follow:
>
> **RESPECT** is unconditional love handed down from generation to generation.
>
> The past is always present, therefore, **ALOHA** is forever ... and **FOREVER** is the old way of our ancients...*eō*

The primary author also contacted Janis Wong, Human Resources Manager of Dole Food Company Hawaii, who replied via email on January 17, 2019 that she would provide contact information for "a couple of people" who had grown up in Whitmore, one of whom might still reside there; however, follow-up emails and call attempts resulted in no further information or responses from Miss Wong. The primary author also attempted to contact Bob Lormand of the Wahiawa Historical Society, and Senator Donovan Dela Cruz, but did not receive a response from either individual.

The primary author conducted informal talk-story interviews over the phone (Winona Aguero. John Francher, and Anonymous I) and in person (Tom Lenchanko), where only hand-written notes were recoded; except for one case in which the primary author audio recorded the interview with the consent of the interviewee for later note-taking purposes (audio files not available). Regarding Anonymous I, their comments were gathered over a series of telephone communications. While the contribution from Anonymous II was gathered in written form via electronic correspondence. In addition to these interactions, the primary author received electronic correspondence from five individuals who likely received the information request when it was disseminated to the Hawaiian Civic Club of Wahiawā. These individuals voiced their concerns about ASM's involvement in the CIA process as well as with the proposed WAP and asked that their letters be included verbatim in this document. To that end, their emails appear in their entirety in Appendix A. Because some of their concerns were based on a misunderstanding, the primary author responded via email with to clear up the confusion and attempt to open further dialog and collaboration with these individuals, this letter is also included in Appendix A. To date, no additional communication has resulted from this effort.

WINONA AGUERO

Winona "Auntie Nona" Aguero was born and raised in Wahiawā and has lived on and off at her home in Whitmore Village near Helemano Elementary School since 1972. Auntie Nona is half-Hawaiian, her mother is pure Hawaiian (born in Kealakekua-Kona on Big Island). However, she says she was brought up in Wahiawā with Filipino culture rather than with Hawaiian culture; her ties through her mother also connect her to Lana'i, where her mother had moved to be with her Filipino husband's plantation family. The house she currently resides in is an original plantation home that was brought up from one of the original Dole plantation camps formerly located "in the valley" around 1947—just as Butler (2001) reported . Her ex-husband's Filipino family were the original owners and he grew up in the home. She acquired the house through marriage and bought out the rest of the family in 1977. Today she owns it with her

eldest son who also resides there. Since she first moved into the 3-bedroom house, it has been home to a multi-generational family with up to nine members residing there at one time. When she remarried in 1987, she moved away and rented out the house until her return in 2001. Currently, she and her husband are enjoying their retirement life there, and share the home with her two sons, a daughter-in-law, and the grandkids. In addition to the family members that live with her, her daughter lives nearby, "down the street." Her intent is to make the best of the home and to pass it on to her children.

During their teenage years, Nona and her older sister worked for Dole. Her sister took the bus each day to work at the cannery; but in 1970, Nona was just 15 years old and worked in the local pineapple fields instead. At that time, Nona and her family lived in Wahiawā town, and Nona spent the summer between her junior and senior year working in the pineapple fields "all over" the area.

When asked about her knowledge of traditional cultural properties and former or ongoing traditional cultural practices within the project area, she replied she is "not aware of that." She remarked that her brother and nephew currently work in the grow houses located on the subject property. She said she never heard of cultural things or saw any of them in the fields as a teen; and she emphasized that she had been "all over" the different pineapple fields. She also said that even though she has lived in Whitmore Village since 1972, she never really heard of traditional practices or properties in the project area. She stated that she pretty much knows everyone in Whitmore and doesn't know any traditional practitioners; and because she belongs to the Wahiawā Civic Club she is exposed to how they [the Hawaiian Civic Club of Wahiawā] talk about how "we are all one," regarding the connection between Kūkaniloko and Whitmore Village. However, she herself has never heard or seen anything like that there. She also remarked that the only person in Whitmore Village who is close to being a cultural practitioner is of the 2nd generation/modern transplants whose families are not original to Wahiawā. Thus, she considers him more as a "modern practitioner." For instance, "he does *imu* and tries to teach Hawaiian stuff to the young kids, but it is after the fact and he does not have any real ties to the Whitmore Village area." She went on to say that these modern practitioners say they are against the proposed WAP, but she expressed skepticism when she said, "if you can prove you are a cultural practitioner, that it is a cultural place, or that you will destroy a native plant then ok; but otherwise, it's neither here nor there."

Auntie Nona spoke of her frustration with people who have Hawaiian blood and say they are against the project but do not have a tie to the area. She mentioned that they talk about how they take care of the land and people but remarked on the fact that she has never seen them at Kūkaniloko. Rather, the only time she sees them is when they are fighting against TMT (the Thirty-Meter Telescope project on Hawai'i Island). She went on to say that she has done community events with the local homeless; so, when they talk about giving to the community, in her opinion, they have no room to talk.

When asked about her knowledge of the proposed Whitmore Agricultural Project, she spoke about having attended two distinct meetings within a week of one another (sometime in 2018), roughly a year before her interview. She stated that the project as described during the first meeting was not what she expected to hear—she had heard about the work, plant, and live-type package folks had been talking about for Waipahu and Wahiawā, but she was not aware that the WAP was slated for the Dole Plantation. Nona said that the second meeting was more "heated up" with more people in attendance voicing their opposition to the project. However, she herself was happy to hear what the ADC rep had to report regarding the "cleaning up" of Whitmore Village. Apparently, the ADC rep showed photographs of homeless, drug activity, and prostitution along the edges of Whitmore Village, which served as a reality check to Nona and showed the efforts ADC had made to clean up the area, particularly near the Senior Living facility, located just beyond and to the east of the project area.

I asked her about how she got so involved with Hawaiian culture and the community because she had admitted that she was raised with more Filipino than Hawaiian culture. She explained that during her studies between 2001 and 2008, at which time she earned her B.A. in Business Administration; she worked as a student employee, in the Native Hawaiian Center at Leeward Community College. The Native Hawaiian Center was funded by Alu Like (a Hawaiian non-profit service organization) and in that position, she attended lots of conferences that helped her grow her awareness of Native Americans and Native rights. Thus, her awareness and passion for Native Hawaiian cultural heritage emerged within the last 20 years from her affiliation with the Native Hawaiian Center. Her experience there helped her appreciate what her family did with *kalo* and *lauhala* in the past. She currently does genealogy and is more mindful of the traditional past and "when archaeological things happen." For instance, she mentioned how her son once found an original *poi* pounder in one of the Wahiawā gulches—thus even though she never saw any cultural sites herself, she knows folks lived there in the past.

During her studies she also took a sustainability class and as a result she goes to local conferences. She also spoke of a recent visit to Villa Rose egg farm, which she said are using solar energy and hiring local construction crews to build the chicken warehouses, which she sees as a positive thing. She said that she is in support of a sustainable food hub that serves the community. After weighing the pros and cons, she finds that the pros: food opportunities and job opportunities, outweigh the cons, namely traffic. She stated, "although everyone says they don't want the traffic it is worth the sacrifice if the food will be right on the table."

In addition to the topics discussed above, the primary author asked Aunty Nona about the buildings labeled "HALL" at the eastern end of the subject property on the historical maps of the project area (see Figure 21). She recalled that was where they had parties and dances and that it was used as a gathering place. She remembered that when she first got married (in the early 1970s), the building closer to the park (farthest east) was the "social hall." She said it was the "open type" and used for weddings, graduations, etc. She then remarked that "as long as you were an employee of Dole you could use it." She went on to talk about another hall "where Dole folks would party" located on the north shore at Pu'uiki, which she believes is "still in business" and stated that Del Monte has another social hall at 'Ewa. Nona recalled that the other building labelled "HALL" (see Figure 21) appeared more like a private residence than another gathering place; and she thought it was a luna or managers house. Per Nona, this house was not a Japanese club to her knowledge; and it was recently occupied. She said that the owner of the Filipino restaurant in Whitmore Village lived in that house for about five years, but he moved out within the last few years. She also said that her brother had recently (prior to our interview) chopped down the trees around the building.

TOM LENCHANKO

Tom Lenchanko has been "kukaawe (a guardian), of the kapuahuawa complex, also known as the Kūkaniloko Birthstones State Monument, since 1975," and is currently engaged in the process of developing the 511-acre property (acquired by the Office of Hawaiian Affairs [OHA] in 2012) "for the enrichment of our community and Hawaiian nation-state, re-energizing our Hawaiian atmosphere and restoring the watershed through reforestation of native hardwoods." Lenchanko spoke of the importance of "malama keiki" for they are "our national treasures and may grow up to be those practitioners who will heal the land for all our benefit." Although he objects to all proposed projects that "change the complexion of the land" he is resigned to the fact that the WAP will likely proceed undeterred; but he remains hopeful that the project will "contribute back to the well-being of our at-large community."

As kūka'awe of Kukaniloko, Lenchanko espouses the ancient concept of ka'ānani'au, "to guard the kapu, privileges, that are specific to Oahu Island," which he additionally translates to "the beauty of experiencing time depends on us all." Per Lenchanko, the puuhonua Kūkaniloko is the *piko* of O'ahu and the nation,

> a center of exact and concise energy or mana, divine supernatural power, and birthplace of our alii, those elite persons who were born, nurtured, disciplined and eventually chosen to lead our early kingdoms. Alii are managers of our sacred land, precious resources and beloved people; and when one was needed a guaranteed loalii would be loaa, obtained, from this place. kauakahiailani, mailikukahi, kalona, piliwale kukaniloko, paakakanilea, kaakauualani, kaau, lale, paoakalani, pakapakakuaua, nononui, kokoloea, papaikaniau… our family's connection to place since time immemorial time eternal."

According to Lenchanko, "the kaona (hidden meaning) for kaananiau also provides for management of our well-being and an understanding of the relationship of the land to its people and the people to their land." He went on to explain that "Mailikuakai set in place the six moku (district) boundaries" and upon that, "the concept of kalana—land units when combined are less than a moku." The 37-acre WAP project area is a portion "iloko (within) the kalana lihue, wahiawa, halemano… conservatively 36,000 acres of the puuhonua kukaniloko, of which kuahu (boundary markers) continue to demarcate this kalana to this very day."

When asked how the proposed WAP will impact traditional cultural properties and practices, he responded that "it changes the complexion of the property but never do we lose its mana." He acknowledges that today, "the complexion of the project area is foreign to our Hawaiian beliefs, ceremony and practices." When prompted that some people would argue that the complexion is already damaged/blemished because of over 100 years of pineapple industry, he responded with the following statement: "it'll help the economics and all that, but what is the benefit to that community over there?" Upon review of this interview summary, Lenchanko added that "100 years of the industrial revolution" that blemished the project area "helped the economics of that time and place" and asked, "but what is the long-term benefit and/or affect to the Whitmore community?"

He went on to remark on how most of the residents of "Dole's Whitmore Village are older retired plantation families, whose children are not interested in the type of work which is now disappearing." He then drew parallels to the Kunia Del Monte operations, which imported migrant workers to work the fields. He voiced his concern as follows: "If the people living right across the street from the WAP don't work there, who's gonna make this project go?" and "Where are they going to get that energy from? It's not going to come from Whitmore Village." He opined that there needs to be an incentive for the younger local people to participate in this project and that it is more likely that it will be run "by foreign people and the people of the Whitmore Village community will become observers and outsiders."

When asked about the potential cultural impact from the presence of foreign laborers, he spoke about how Hawaiians have "a best approach, kaananiau, and traditional ways of conserving energy within a controlled atmosphere" regarding subsistence and agriculture. He also stated that "the foreign influx resulted in a military occupation, cattle ranching denuding the land, sugar/pineapple plantations pesticide poisoning of our water aquifer and there's the tourism industry pricing out our family's ability to live in Hawaii…" When asked to clarify whether changing the complexion of the land referred to the land or the people living on the land, he responded that he meant "all of our well-being." When asked about his knowledge of former traditional cultural sites within the project area he responded that "all of it is important and that the project area lay within the 36,000 acres of the puuhonua kukaniloko and is thus extremely significant to us as well." Lenchanko admitted that the relative project area is considered "just old Dole business property" today. However, he stated "the foreigner's movement of a site and/or its structure does not end nor destroy a traditional cultural property." In his opinion, traditional cultural properties are "here forever as long as someone has the opportunity to learn, understand and believe in a place…" and "this is what we're imbuing into our young children to perpetuate that traditional cultural properties are still here – we can see them." He also said, "when some will say they cannot see anything, that's cuz it's not meant for you – that's why kupuna, elder(s), teachings is not given to just anybody." He continued by saying that development projects like the WAP have detrimental cultural impacts because "the state's review process fails to afford us our responsibility to manage our Hawaiian traditional cultural property, beliefs, ceremony and practices upon our family property." Per Lenchanko, a further detrimental cultural impact is "their wrongful interpolation for our value of Hawaiian traditional comprehension of place."

When asked what he would prefer to see in the project area instead of the proposed project, he answered that he would like to see "someone care for the people living on the river and living within the grass overgrowth on the old Dole land surrounding Whitmore Village." He went on to say that his primary concern is "public safety, health and the well-being for the people who have generational ties to kukaniloko." He sees the greatest need is to care for those who cannot take care of themselves: the houseless community, the children who count on school for breakfast and lunch, and the survival of hospitals and elder care facilities. He suggested the project may provide support for those that don't have – or are too young to support themselves, or too old or too unwell. Lenchanko referred to this as "the sad end to the picture we're watching that our extended families are neglected most of the time." And reiterated, "Again, kupuna teaching: grow the practitioner who will heal our land for all our benefit." He recalled mentioning to our district state senator and representatives "if you grow something and that makes your community healthy that becomes a template, a living example of the well-being of a community you can market; without well-being, the product does not have value."

When asked if he prefers the agricultural land to be conservation/preservation land he stated, "to a degree, yes"; in addition to the substantive disciplines and principles of watershed management and reforestation of native hardwoods that would not be harvested. He also mentioned successful progressive farming programs such as Maʻo Organic Farms on the Waianae Coast and Mohala Farms in Waialua, complements the restoration and re-establishment for loʻi kalo (taro ponds) and loko iʻa (fish ponds) and "that working in the ground and the soil enriches the body, mind and spirit naturally."

Lenchanko provided the following statement as part of his review of the interview summary, it is reproduced in its entirety, exactly as he wrote it.

> In closing "when the life force of an alii was to enter this earthly realm, this our paradise, all work ceased. This most solemn of occasion released from the people the energy factor or mana that transcends from the aina. Prayer emanated throughout the land. What was welling up in the hearts and minds of Hawaii nei, was that the gods, yes the gods would send a child, a child of character, strength and vision, possessing the mental acumen moral rectitude imbued from on high to lead our people, our nation toward a life filled with peace and prosperity."

…e kukaawe i na kapu o kukaniloko no ka mea aloha no hoi kakou ia lakou i na kau a kau…
to guard the privileges of kukaniloko because we love them for all time

JOE FRANCHER

Joe Francher is the vice chair of the Wahiawa-Whitmore Village Neighborhood Board #26 and a resident of Wahiawā. When asked if he knew of any former or ongoing traditional cultural practices or traditional cultural properties within the project area he stated that he did not. He mentioned that many of the Whitmore Village residents are older retired Dole workers and their families and that most of the "old timers" are a mix of Filipino and Native Hawaiian. When asked about potential cultural impacts from the proposed project he mentioned that community members had complained at the neighborhood board meetings about increased traffic that will affect the peace of the town; he mentioned this concern in the context of the NAVCOMM EastPac upgrade that occurred 6-7 years ago and increased traffic along Whitmore Avenue and upset the county, "so now that's the first thing they complain about." In addition the community is concerned that the job openings from the WAP will bring in new outsiders with more qualifications than what is available locally and will thus take the jobs from the local residents. He also mentioned that there had been multiple complaints about where Whitmore Village residents' property boundaries are and that the Navy and ADC had expanded their reach into areas that residents had previously used as gardens. When asked how he felt about the proposed WAP, he stated, "personally I thnk it's an improvement for the area" and did not object to it. However, he "did object to the way that ADC proceeded without community involvement and without apparent concern for the community." He went on to state that, "It was not until after our second neighborhood board meeting on this subject and the involvement of Senator DelaCruz, that ADC began to pay attention to the community."

ANONYMOUS I

A third-generation resident of Whitmore Village who currently resides there was unwilling to go on record using their name. They are uncomfortable sharing their knowledge with ASM because it has been passed down through generations and will continue to do so without being written down or recorded because it is *kapu*. Although they declined to participate in the formal CIA process, when contacted most recently they wanted to go on record about their concern for the community and what they consider a priority before the WAP or any other development is undertaken near Whitmore Village. They propose that an alternate road for entry and exit to the Whitmore Village community be built because when something goes wrong, residents need to be able to get out and emergency vehicles and personnel need to get in. During recent storms with high wind gusts, a utility pole went down in their community, which blocked the residents' access to the community and hampered their ability to leave.

ANONYMOUS II

This participant preferred to remain anonymous and to respond in writing via electronic correspondence rather than be interviewed. The questions and responses (received February 15, 2019) are reproduced in their entirety below:

> **ASM:** Are you aware of any traditional cultural properties specifically within the proposed Whitmore Ag Project area (site of Dole operations):
>
> **Anonymous II:** Cultural properties specifically within the site are unknown to me. These lands have been private property of recent so no one has been allowed within these property lines for many years. I am not really qualified to answer this question. However, the history of these lands dating back to the times of the births of our Royal children is important to acknowledge and perpetuate. From 860 AD these lands were recognized as the Sacred Uplands worthy of embracing the birth of our *nā Aliʻi*. These *Aliʻi* were raised and educated in these, the "*kula lands*" or lands of education and schooling.
>
> **ASM:** Are you aware of any ongoing or former traditional cultural practices occurring specifically within the proposed "Whitmore Ag Project" project area?
>
> **Anonymous II:** This area lies within the 36,000 acres of *Puʻuhonua Kūkaniloko*. At one time the *kapu* of these lands were enforced 24-7. Since the 1900's with the illegal taking of these lands by foreigners, all practices have been suppressed. I do not know of any that are traditional cultural practices here on said property in 2019. However, "across the street named Kamehameha Highway" lies 5 acres of what remains to acknowledge these "36,000 acres of *Puʻuhonua Kūkaniloko, kalana Wahiawā, Līhuʻe, Halemano...*" Presently acknowledged as Kūkaniloko Birthstones State Monument, the Hawaiian Civic Club of Wahiawā has taken care of this site since 1960 as a Club

and since the early 1930's as *kanaka mauli.* These families, now in their fourth generation descendants, still take time from their lives to protect the *kapu* through the constant physical maintenance and care of the grounds of Kūkaniloko Birthstones State Monument; and by especially preserving the *mo'olelo* - traditional comprehension - of these Sacred Uplands of Wahiawā through lessons held in their outdoor classroom onsite.

ASM: What potential impact will the proposed Whitmore Ag project have on traditional cultural practices/properties?

Anonymous II: Occupation for the proposed purpose will further bury our history. What about the future generations? Will they know? Will they look upon these lands and be able to immediately know what happened here 100 plus years ago? The answer is sadly no.

ASM: Do you have any suggestions for how to mitigate such impacts that you would like to see incorporated in the proposed project?

Anonymous II: I would like to see a part of the "Whitmore Ag Project" Administration Building dedicated to acknowledging the past of these 36,000 acres of *Pu`uhonua Kukaniloko, kalana Wahiawā, Līhu'e, Halemano...* with the proper maps, photos and *mo'olelo.* Hawaiian Civic Club of Wahiawā would be happy to assist with this research and display.

4. IDENTIFICATION AND MITIGATION OF POTENTIAL CULTURAL IMPACTS

The OEQC guidelines identify several possible types of cultural practices and beliefs that are subject to assessment. These include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The guidelines also identify the types of potential cultural resources, associated with cultural practices and beliefs that are subject to assessment. Essentially these are natural features of the landscape and historic sites, including traditional cultural properties. A working definition of Traditional cultural property is provided below:

> "Traditional cultural property" means any historic property associated with the traditional practices and beliefs of an ethnic community or members of that community for more than fifty years. These traditions shall be founded in an ethnic community's history and contribute to maintaining the ethnic community's cultural identity. Traditional associations are those demonstrating a continuity of practice or belief until present or those documented in historical source materials, or both.

The origin of the concept of "traditional cultural property" is found in National Register Bulletin 38 published by the U.S. Department of Interior-National Park Service. "Traditional" as it is used, implies a time depth of at least 50 years, and a generalized mode of transmission of information from one generation to the next, either orally or by act. "Cultural" refers to the beliefs, practices, lifeways, and social institutions of a given community. The use of the term "property" defines this category of resource as an identifiable place. Traditional cultural properties are not intangible, they must have boundaries and are thus subject to the same kind of evaluation as any other historic resource, with one very important exception. The significance of traditional cultural properties should be determined by the community that values them. However, in the Hawaiian Islands the identification and significance evaluation of "traditional cultural properties" as defined above presents an inherent challenge, for the concept of boundaries runs counter to the traditional Hawaiian belief system. The sacredness of a feature is often cosmologically tied to the rest of the landscape as well as other features within it. Thus, to limit a traditional cultural property to a specifically defined area may separate the location from what makes it significant in the first place.

Although inadequate and offensive to some, the concept of boundaries remains the regulatory benchmark for defining and assessing traditional cultural properties. Because the OEQC guidelines do not contain criteria for assessing the significance of traditional cultural properties, the current study utilized the state criteria for evaluating the significance of historic properties, of which traditional cultural properties are a subset. To be significant, the potential historic property or traditional cultural property must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

a Be associated with events that have made an important contribution to the broad patterns of our history;

b Be associated with the lives of persons important in our past;

c Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

d Have yielded, or is likely to yield, information important for research on prehistory or history;

e Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

While it is the practice of the DLNR-SHPD to consider most historic properties significant under Criterion d at a minimum, traditional cultural properties, by definition, would also be significant under Criterion e. A further analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Hawaiian communities resulted from the *Ka Paʻakai O Kaʻāina* v. Land Use Commission court case. The court decision established a three-step process for the evaluation of such potential impacts. The first step is to identify any valued cultural, historical, or natural resources that may be present, and the extent to which any traditional and customary native Hawaiian rights are exercised. The second step is to identify the extent to which those resources and rights will be affected or impaired. And the third step is to specify any mitigation actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

No archaeological sites were identified within the current project area as a result of the fieldwork conducted as part of the historic properties survey (Novell et al. 2019). These negative findings combined with the lack of information regarding traditional cultural practices specifically related to the subject parcel are not unexpected as the current project area was the site of the Dole Company Operations Facility at Whitmore Village since at least 1946; and prior to that was likely planted in pineapple as part of the HAPCo. acreage as far back as the early 1900s. Since around 1946, the project area has comprised garages, machine shops, warehouses, storage buildings, greenhouses, and a maintenance yard; in addition to offices, meeting rooms, and clubhouses intended, which served the administrative, recreational, and research needs of Dole and their employees and families. Currently, some of the buildings within the project area are being leased by independent companies; while the remainder of the buildings appear to be unused. Thus, any traditional cultural practices that may have been practiced within the current project area likely predated the establishment of HAPCo (later Dole) over a century ago.

Given the negative findings of the current study with respect to the identification of any traditional cultural practices or properties located within the boundaries of the subject property, due to the extensive land modification associated with over a century of commercial pineapple agriculture and the former Dole Company Operations Facility, it is our conclusion the redevelopment and continued use of the property will not result in any direct impacts to traditional cultural properties or associated practices.

However, as revealed in the consultation process the project area location presents a prime example of the inherent challenge of defining the boundaries of traditional cultural properties. Although the focus of this assessment is meant to be narrowed to a 37-acre piece of property, which is the proposed WAP project area, some community members consulted in the preparation of the current document do not recognize the boundaries of the project area. Rather, they see the project area as *i loko* or within the 36,000-acre traditional cultural property *pu‘uhonua* Kūkaniloko and the *kalana* of Wahiawa-Lihue-Helemano; and that any further division runs counter to their traditional Hawaiian belief system. Thus, the proposed redevelopment and continued use of the property will have an indirect impact to the broader traditional cultural property *pu‘uhonua* Kūkaniloko, which holds cultural significance to those who believe in it and are actively engaged in the preservation of the traditional cultural properties and practices therein.

Therefore, we recommend that the beliefs of the guardians of *Kukaniloko* and other Native Hawaiians be taken into account in an effort to allow the community that values the traditional cultural property to determine its significance. To that end, we suggest that any future redevelopment projects incorporate a reference to the cultural significance of Wahiawā as the former birthplace of the Lo Ali‘i and the home of the *pu‘uhonua* Kūkaniloko. We recommend that ADC collaborate with local community members, such as the members of the Hawaiian Civic Club of Wahiawā and cultural practitioners to determine the best approach to creating a culturally sensitive representation of the significance of the area that will honor the beliefs and traditional customs of the Native Hawaiian community of Wahiawā.

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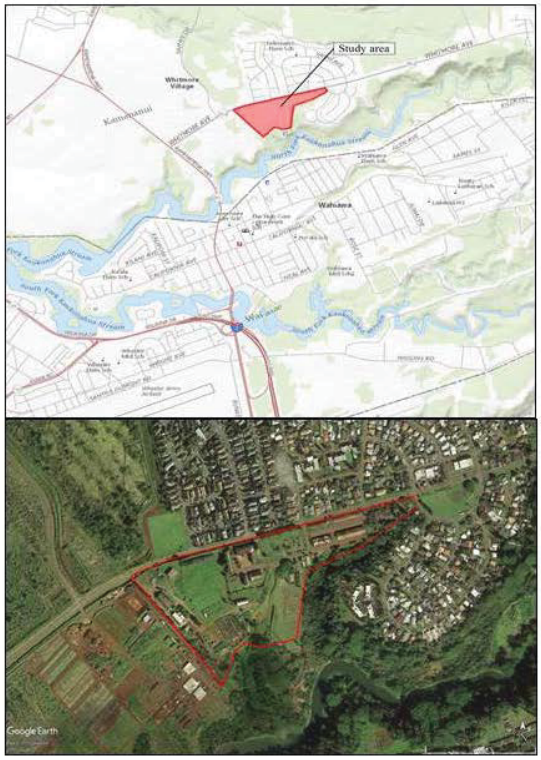
APPENDIX A

ELECTRONIC CORRESPONDENCE

Information request email forwarded to Civic Club of Wahiawā

From: Teresa Gotay
To: "Jo-Lin Kalimapau"
Subject: updated whitmore project info request
Date: Tuesday, January 22, 2019 1:28:24 PM
Attachments: Final Whitmore Report-Technical Elements-20170803.pdf
asmplainloqo638189722175261316884398

My name is Teresa Gotay and I am an anthropologist/archaeologist with ASM Affiliates (ASM), a cultural resource management firm based out of Hilo and Honolulu. I am writing to you for assistance in finding and contacting community members to include *kupuna* with knowledge of the Whitmore Village property in Wahiwa District of O'ahu. ASM is preparing a cultural impact assessment on behalf of the Agribusiness Development Corporation (ADC) of Hawai'i, which plans to replace the now defunct sugar and pineapple industries with local diversified agriculture , including the creation of a food hub in Whitmore Village called the Whitmore Agricultural Project located on 37-acres (Tax Map Key parcels [1] 7-1-002:009 and 004). I am looking for people who would be willing to share cultural information related to the property, including knowledge of any traditional practices associated with the parcel shown in the map (shaded red) and the satellite image below (outlined in red); in addition to potential impacts to cultural practices and/or properties the project might have.



I currently reside in Kailua O'ahu and have an office in downtown Honolulu and would be able to meet with willing folks for informal talk story-type interviews in person or over the phone, at their convenience (time/location-wise). I would greatly appreciate any information you might have of the project area vicinity and/or any suggestions for people I might contact to gather information about the parcel. I have also provided my contact information in the event that you would like to forward it to someone that might be able to share their knowledge of the area with me:

I can be reached via email tgotay@asmaffiliates.com or on the telephone at the office (808) 439-8089 or on my cell phone (928) 607-5714

Thank you for your time and consideration. I look forward to hearing from you.

Best,

Teresa Gotay

Senior Archaeologist
ASM Affiliates • Honolulu, HI
(808) 439-8089
tgotay@asmaffiliates.com
www.asmaffiliates.com

Email from Jazmine Corpuz

From: Jazmine Corpuz
To: Teresa Gotay
Subject: Whitmore Agriculture Project CIA Input
Date: Monday, February 11, 2019 3:15:52 PM

My name is Jazmine Corpuz.

I am a resident of the Whitmore area with significant cultural knowledge about this place and the cultural practices, traditions, and resources that take place here.

I have very serious concerns about ADC's Whitmore agricultural project.

I find your letter to be lacking in information that would make me comfortable sharing cultural information, nor does it provide adequate information that would allow me or any community opportunity to provide a knowledgeable and informed response as to the extent of the adverse impacts the project will have on our cultural practices and resources.

Additionally, it is inappropriate that a Hilo firm has been used to work on a O'ahu project. It seems you have no understanding of our unique community or culture. We believe we have the right to work with individuals who are properly trained to conduct this type of work and appropriately sensitized to Hawaii's local and native cultures.

We find much of the content of the report, *Development of a Master Plan for the Whitmore Agricultural Project*, which you have sent to us offensive and even racist, particularly towards Native Hawaiians. It is for this reason that we do not believe ASM Affiliates is an appropriate group to be conducting the cultural impact assessment.

We believe the community should have the opportunity to meet and decide among themselves what information they are willing to share with your project.

There are significant cultural practices that take place here and we are happy to work with ADC to ensure our traditional and customary rights are protected, but we should have not to work with a company that lacks the sensitivity and expertise to understand our community.

We would like this letter included verbatim in the draft CIA.

We look forward to working with ASM to protect our rights and improve their Master Plan such that it works for and with our community.

Thank you,
Jazmine Corpuz

Email from Carolyn Ringor

From: Carolyn Ringor
To: Teresa Gotay
Subject: Whitmore agriculture project CIA input
Date: Monday, February 11, 2019 3:25:58 PM

My name is Carolyn Ringor

I am a cultural descendant of the Whitmore area with significant cultural knowledge about this place and the cultural practices, traditions, and resources that take place here.

I strongly oppose ADC's Whitmore agricultural project.

I find your letter to be lacking in information that would make me comfortable sharing cultural information, nor does it provide adequate information that would allow me or any community opportunity to provide a knowledgeable and informed response as to the extent of the adverse impacts the project will have on our cultural practices and resources.

Additionally, it is inappropriate that a Hilo firm has been used to work on a O'ahu project. It seems you have no understanding of our unique community or culture. We believe we have the right to work with individuals who are properly trained to conduct this type of work and appropriately sensitized to Hawaii's local and native cultures.

We find much of the content of the report, *Development of a Master Plan for the Whitmore Agricultural Project*, which you have sent to us offensive and even racist, particularly towards Native Hawaiians. It is for this reason that we do not believe ASM Affiliates is an appropriate group to be conducting the cultural impact assessment.

We believe the community should have the opportunity to meet and decide among themselves what information they are willing to share with your project.

There are significant cultural practices that take place here and we are happy to work with ADC to ensure our traditional and customary rights are protected, but we should have not to work with a company that lacks the sensitivity and expertise to understand our community.

We would like this letter included verbatim in the draft CIA.

We look forward to working with ASM to protect our rights and improve their Master Plan such that it works for and with our community.

Thank you,
Carolyn Ringor

Email from Tehani Ayau

From: Tehani Ayau
To: Teresa Gotay
Subject: Support HB 871
Date: Tuesday, February 12, 2019 12:52:07 AM

My name is Tehani Ayau.

I am a long-time resident of the Whitmore area with significant cultural knowledge about this place and the cultural practices, traditions, and resources that take place here.

I strongly oppose and have very serious concerns about ADC's Whitmore agricultural project.

I find your letter to be lacking in information that would make me comfortable sharing cultural information, nor does it provide adequate information that would allow me or any community opportunity to provide a knowledgeable and informed response as to the extent of the adverse impacts the project will have on our cultural practices and resources.

Additionally, it is inappropriate that a Hilo firm has been used to work on a O'ahu project. It seems you have no understanding of our unique community or culture. We believe we have the right to work with individuals who are properly trained to conduct this type of work and appropriately sensitized to Hawaii's local and native cultures.

We find much of the content of the report, *Development of a Master Plan for the Whitmore Agricultural Project*, which you have sent to us offensive and even racist, particularly towards Native Hawaiians. It is for this reason that we do not believe ASM Affiliates is an appropriate group to be conducting the cultural impact assessment.

We believe the community should have the opportunity to meet and decide among themselves what information they are willing to share with your project.

There are significant cultural practices that take place here and we are happy to work with ADC to ensure our traditional and customary rights are protected, but we should have not to work with a company that lacks the sensitivity and expertise to understand our community.

We would like this letter included verbatim in the draft CIA.

We look forward to working with ASM to protect our rights and improve their Master Plan such that it works for and with our community.

Thank you,
Tehani Ayau

Sent from my iPhone

Email from Leinani Ayau

From: luvlilikoi
To: Teresa Gotay
Subject: Whitmore Agriculture Project
Date: Tuesday, February 12, 2019 7:47:23 AM

My name is Leinani Ayau.

I am a long time resident of the Whitmore area with significant cultural knowledge about this place and the cultural practices, traditions, and resources that take place here.

I strongly oppose and have serious concerns about the Whitmore agricultural project.

I find your letter to be lacking in information that would make me comfortable sharing cultural information, nor does it provide adequate information that would allow me or any community opportunity to provide a knowledgeable and informed response as to the extent of the adverse impacts the project will have on our cultural practices and resources.

Additionally, it is inappropriate that a Hilo firm has been used to work on a O'ahu project. It seems you have no understanding of our unique community or culture. We believe we have the right to work with individuals who are properly trained to conduct this type of work and appropriately sensitized to Hawaii's local and native cultures.

We find much of the content of the report, *Development of a Master Plan for the Whitmore Agricultural Project*, which you have sent to us offensive and even racist, particularly towards Native Hawaiians. It is for this reason that we do not believe ASM Affiliates is an appropriate group to be conducting the cultural impact assessment.

We believe the community should have the opportunity to meet and decide among themselves what information they are willing to share with your project.

There are significant cultural practices that take place here and we are happy to work with ADC to ensure our traditional and customary rights are protected, but we should have not to work with a company that lacks the sensitivity and expertise to understand our community.

We would like this letter included verbatim in the draft CIA.

We look forward to working with ASM to protect our rights and improve their Master Plan such that it works for and with our community.

Thank you,
Leinani Ayau

Email from Mario Raquino

From: Mario Raquino
To: Teresa Gotay
Subject: Whitmore Agriculture Project CIA input
Date: Wednesday, February 13, 2019 5:41:26 PM

To Whom It May Concern,

My name is Mario Raquino.

I am a resident of the Whitmore area for 66 years with significant cultural knowledge about this place and the cultural practices, traditions, and resources that take place here.

I strongly oppose and have very serious concerns about ADC's Whitmore agricultural project.

I find your letter to be lacking in information that would make me comfortable sharing cultural information, nor does it provide adequate information that would allow me or any community opportunity to provide a knowledgeable and informed response as to the extent of the adverse impacts the project will have on our cultural practices and resources.

Additionally, it is inappropriate that a Hilo firm has been used to work on a O'ahu project. It seems you have no understanding of our unique community or culture. We believe we have the right to work with individuals who are properly trained to conduct this type of work and appropriately sensitized to Hawaii's local and native cultures.

We find much of the content of the report, *Development of a Master Plan for the Whitmore Agricultural Project*, which you have sent to us offensive and even racist, particularly towards Native Hawaiians. It is for this reason that we do not believe ASM Affiliates is an appropriate group to be conducting the cultural impact assessment.

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We would like this letter included verbatim in the draft CIA.

We look forward to working with ASM to protect our rights and improve their Master Plan such that it works for and with our community.

Thank you,
Mario Raquino

Body of email response sent to: Jazmine Corpuz, Carolyn Ringor, Tehani Ayau, Leinani Ayau, and Mario Raquino

Thank you for responding to my information request email. I sincerely apologize for having offended you with the email and attached Master Plan. I would like to clarify that ASM did not have a hand in preparing the Master Plan document for ADC. Thus, the contents of that document do not reflect the values or ethics of ASM. I chose to provide that document as a means of familiarizing potential interviewees with the proposed Whitmore Agricultural Project.

ASM has offices in both Hilo and Honolulu and our staff is dedicated to conducting appropriate cultural resources management projects across the Hawaiian Islands. We were contracted by ADC to assess potential cultural impacts from the development of the proposed Whitmore Agricultural Project. Participation in this process is completely voluntary and can be done while maintaining anonymity if one prefers. Beyond what archival research can reveal about the project area, we rely on people such as yourself to share their knowledge and concerns so that we might create a record of it, which could be integrated in future development plan and subsequent development.

I understand and respect the sensitive nature of traditional cultural knowledge, particularly in the context of the complicated colonial history and the resultant lack of mistrust that has emerged. I personally strive to conduct myself with cultural sensitivity when performing these kinds of studies and am driven to represent the communities that will be impacted by this and other proposed development projects rather than furthering the agenda of the developers. ASM's staff who participate in the preparation of cultural impact studies have a proven record of their devotion to fairness and honesty.

Per your request I will include your letter in the draft CIA. However, if you are willing I would appreciate the opportunity to include your cultural knowledge and concerns in our report. I would be happy to provide any additional information you need to do so.

In closing, I regret that the Master Plan document and my information request caused you discomfort; that was and is never the intent of my work—please accept my apology. If you would like to contact me to discuss this further feel free to call me on my cell phone: (808) 854-0553.

Sincerely,



Teresa Gotay
Senior Archaeologist
ASM Affiliates • Honolulu, HI
(808) 439-8089
tgotay@asmaffiliates.com
www.asmaffiliates.com

APPENDIX B

INTERVIEW CONSENT FORMS

Winona Aguero

ASM affiliates
Hilo Office: (808) 969-6066 Fax: (808) 443-0065
507-A E. Lanikaula Street, Hilo, HI 96720

Honolulu Office: (808) 439-8089 Fax: (808) 439-8087
820 Mililani Street, Suite 700, Honolulu, HI 96813

On behalf of ASM Affiliates, we thank you for your time and contribution to improving our understanding of culturally significant practices and places. Your participation in this study is entirely voluntary and if you wish to change your responses, you may do so at any time by contacting the interviewer or a staff member at our office at the phone numbers listed above.

Informal "Talk Story" Interview Consent Form

I agree to take part in this interview for the purposes of the historical/anthropological study of ASM Affiliates. The purpose and nature of the interview has been explained to me. I consent to the use of the information gathered in this interview by ASM Affiliates for the purposes explained to me.

☒ I agree that my name may be used for the purposes of this investigation and cited in subsequent professional reports.

☐ I do not wish that my name may be used or cited, and prefer to remain anonymous in this investigation and in subsequent professional reports.

Print name of interviewee: Teresa Gotay [Winona Aguero]

Signature of interviewee: Winona Aguero

Date: 2/22/2019

I have explained the purpose of the current investigation and the implications of being interviewed to the interviewee and I believe that the consent is informed and that he/she understands the implications of participating in this study.

Print name of interviewer: TERESA GOTAY

Signature of interviewer: T

Date: 2/22/2019

Joe Francher

ASM affiliates
Hilo Office: (808) 969-6066 Fax: (808) 443-0065
507-A E. Lanikaula Street, Hilo, HI 96720

Honolulu Office: (808) 439-8089 Fax: (808) 439-8087
820 Mililani Street, Suite 700, Honolulu, HI 96813

Informal "Talk Story" Interview Consent Form

On behalf of ASM Affiliates, we thank you for your time and sharing your valuable insight into improving our understanding of culturally important places and things. Your participation in this study is voluntary. You may withdraw from this project at any time until the completion date of this study. During the interview, you can choose to not answer any question(s) at any time for any reason. If you disapprove of, wish to change, add to, delete, or otherwise change your response, you may do so at any time to the completion of this project by contacting the interviewer or a staff member at our office.

By signing below, you agree to take part in this interview for the purposes of the historical/anthropological study of ASM Affiliates. The purpose and nature of the interview has been explained to me by an ASM Affiliates employee. I consent to the use of the information shared in this interview by ASM Affiliates for the purposes explained to me.

[X] I agree to participate in this interview and I give permission to ASM Affiliates to use and cite my name provided below in this study.

[ ] I agree to participate in this interview, however, I do not give permission for my name to be used or cited, and prefer to remain anonymous in this study.

Print name of Interviewee: Joseph Francher

Signature of interviewee: [signature]

Date: January 8, 2019

I have explained the purpose of the current investigation and the implications of being interviewed to the interviewee and I believe that the consent is informed and that he/she understands the implications of participating in this study.

Print name of interviewer: TERESA GOTAY

Signature of interviewer: [signature]

Date: 1/8/2019

Tom Lenchanko

PENDING SIGNATURE

APPENDIX E

Mobility Analysis Report



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DRAFT

Mobility Analysis Report for the Proposed Whitmore Community Food Hub Complex

Wahiawa, HI

Prepared for:
PBR Hawaii

January 2, 2019

SD18-0285

FEHR & PEERS

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1.0 EXECUTIVE SUMMARY

The Whitmore Community Food Hub Complex project proposes to redevelop an existing 34-acre site to create a local food hub with agricultural infrastructure for shared product aggregation and processing. The food hub is proposed with supply chain infrastructure intended to support the processing of locally produced food.

This report documents the assessment of mobility and access on and around the site with the proposed development. The project site is located makai of Whitmore Avenue and mauka of Kamehameha Highway near Whitmore Village on Oahu. The site is a former Dole Company Operation Facility, currently occupied by a small agricultural processing facility, an office building, a field office, greenhouses, parking sheds, a machine shop and storage warehouses. In 2018, approximately 50 employees worked on-site.

The proposed project includes redevelopment of the site with the following land uses:

- Food Hub Warehouse and Visitor Center
- Food Production and Processing
- Logistics Yard
- Research and Innovation Node (Office)
- Farmers Market
- Workforce Housing
- Parking
- Renovation of the Existing Machine Shop and Shed

Currently, access to the project site is provided on the south side of Whitmore Avenue at Ihiihi Avenue and Lalawai Street. Redevelopment of the site will include two additional driveways at Uakanik'oo Street and across from Kahi Kani Park for a total of four driveways serving the project.

Potential transportation and mobility impacts of the proposed project were evaluated following guidelines established by the State of Hawaii Department of Transportation – Highways Division (HDOT), the City & County of Honolulu (CCH) Department of Planning & Permitting (DPP) Traffic Review Branch (TRB), and the CCH Department of Transportation Services (DTS). Traffic operations at study intersections were evaluated during the weekday morning (AM) and evening (PM) peak hours for Existing (2018), Baseline (2028) Without Project, and Baseline (2028) With Project conditions based on existing roadway configurations. The Existing (2018) and Baseline (2028) Without Project conditions included the analysis of six existing study intersections. The Baseline (2028) With Project scenario included a seventh study intersection at Whitmore Village and the proposed driveway across from Kahi Kani Park.

At full buildout, the proposed project is forecast to generate a total of 2,578 net new daily vehicle trips, including 138 net new AM peak hour trips (104 inbound/34 outbound), and 239 net new PM peak hour trips (92 inbound/147 outbound).

Key findings of the mobility analysis are summarized below:

- The existing study intersections operate adequately based on current roadway conditions and traffic volumes.
- The Master Plan for the Whitmore Community Food Hub Complex envisions the site to be developed incrementally as demand arises. Based on the existing roadway conditions and lane configurations, the addition of project-related trips at full buildout is anticipated to increase delay to less than desirable levels at the following unsignalized study intersections:
    - Whitmore Avenue/Saipan Drive
    - Whitmore Avenue/Driveway 1 (across from Kahi Kani Park)
    - Whitmore Avenue/Uakanikoʻo Street (Driveway 2)

  Potential improvements to lessen the impacts of the forecasted increase in delay are discussed in this report, such as modifications to the roadway or traffic control. Ultimately, no changes to current traffic control are recommended at Whitmore Avenue/Saipan Drive intersection and the Whitmore Avenue/Uakanikoʻo Street (Driveway 2), as improving delay for the side streets would result in increasing delay along Whitmore Avenue.

  At the future intersection of Whitmore Avenue/Driveway 1 (Across from Kahi Kani Park), the project shall install all-way stop control (AWSC) if required by HDOT. Driveway 1 is planned to provide access for project employees and truck trips. Therefore, it is also recommended that the project provide a separate eastbound right turn lane and a westbound refuge lane on Whitmore Avenue to accommodate the anticipated truck activity.
- The vision for the project includes placemaking elements and improved mobility in Wahiawa. The placemaking component includes integrating public spaces throughout the project site intended for residents, employees, and visitors to traverse the development by walking or biking. Externally, the project proposes to provide a multi-use path along the south side of Whitmore Avenue between the site and Whitmore Community Park. The multi-use path will provide a separated facility for pedestrians and bicyclists to access the site. Crosswalks are recommended across all project driveways to direct the flow of pedestrians and improve visibility of people walking. In addition, bus stop amenities are recommended at the existing bus stops on Whitmore Avenue.

2.0 INTRODUCTION

This mobility assessment report (MAR) presents the results of the study conducted by Fehr & Peers for the proposed Whitmore Community Food Hub Complex in the Wahiawa community of the island of Oahu. The project site is located on the south side of Whitmore Avenue (Route 804), mauka of Kamehameha Highway (Route 80). Both roadways are under the jurisdiction of the Highways Division of HDOT. This MAR was conducted in accordance with the guidelines and standards of the affected government agencies and addresses the potential project impacts on all travel modes.

Whitmore Village is a small community located in Central Oahu, just north of Wahiawa and less than three miles from the Dole Plantation. The community consists of predominantly single-family residential use. Naval communications and telecommunications, including NSA Hawaii, are also located within Whitmore at the base of the Ewa Forest Reserve. A few locally serving commercial uses are located on the northeast corner of Whitmore Avenue and Ihiihi Avenue-Nana Ihi Avenue. Ali'i Agriculture Farms is located immediately west of the project site, across from Saipan Drive. West of the project site across Kamehameha Highway lies the historical site of the Kukaniloko Birthing Stones. South of the project is the Kaukonahua Stream and the community of Wahiawa.

The existing site includes the Whitmore Agricultural Tech Park and remaining structures from the former Dole Company Operation Facility. Currently 50 employees work on-site. Existing structures on- site include:

- A small agricultural processing facility
- An office building
- A field office
- Greenhouses
- Parking sheds
- A machine shop
- Storage warehouses

2.1 PROJECT DESCRIPTION

The Whitmore Community Food Hub Complex project proposes to redevelop an existing site to create a local food hub with agricultural infrastructure for shared product aggregation and processing. The food hub is proposed with supply chain infrastructure intended to support the processing of locally produced food. The Whitmore Food Hub Complex is planned to initially serve the processing needs of the central plain agricultural community surrounding Wahiawa, and potentially additional surrounding areas in Oahu. The vision and master plan for the project included collaboration from State of Hawaii agencies, local

governments, and civic organizations led by the Agribusiness Development Corporation (ADC) of the Hawaii Department of Agriculture.

The proposed project includes redevelopment of a 34-acre site into a community food hub, including:

- 360,000 square foot (sf) food hub and warehouse with an approximately 39,000 sf logistics yard
- 60,000 sf food processing facility
- 22,400 sf research and innovation node
- 10,000 sf visitor center
- 6,000 sf farmers market
- 100 Single-Occupancy Apartments (micro-apartments)
- Parking for all proposed uses
- Renovation of the existing machine shop and shed

At buildout, the project is estimated to employ approximately 121 employees. The visitor center and farmers market functions are anticipated to serve the locals and tourists, particularly due to the proximity to Dole Plantation located approximately 2.5 miles north of the project site.

Access to the project is proposed along four driveways off of Whitmore Avenue:

- Driveway 1: Whitmore Avenue across from Kahi Kani Park (truck and employee access only)
- Driveway 2: Whitmore Avenue/Uakaniko'o Street
- Driveway 3: Whitmore Avenue/Ihiihi Avenue
- Driveway 4: Whitmore Avenue/Lalawai Street

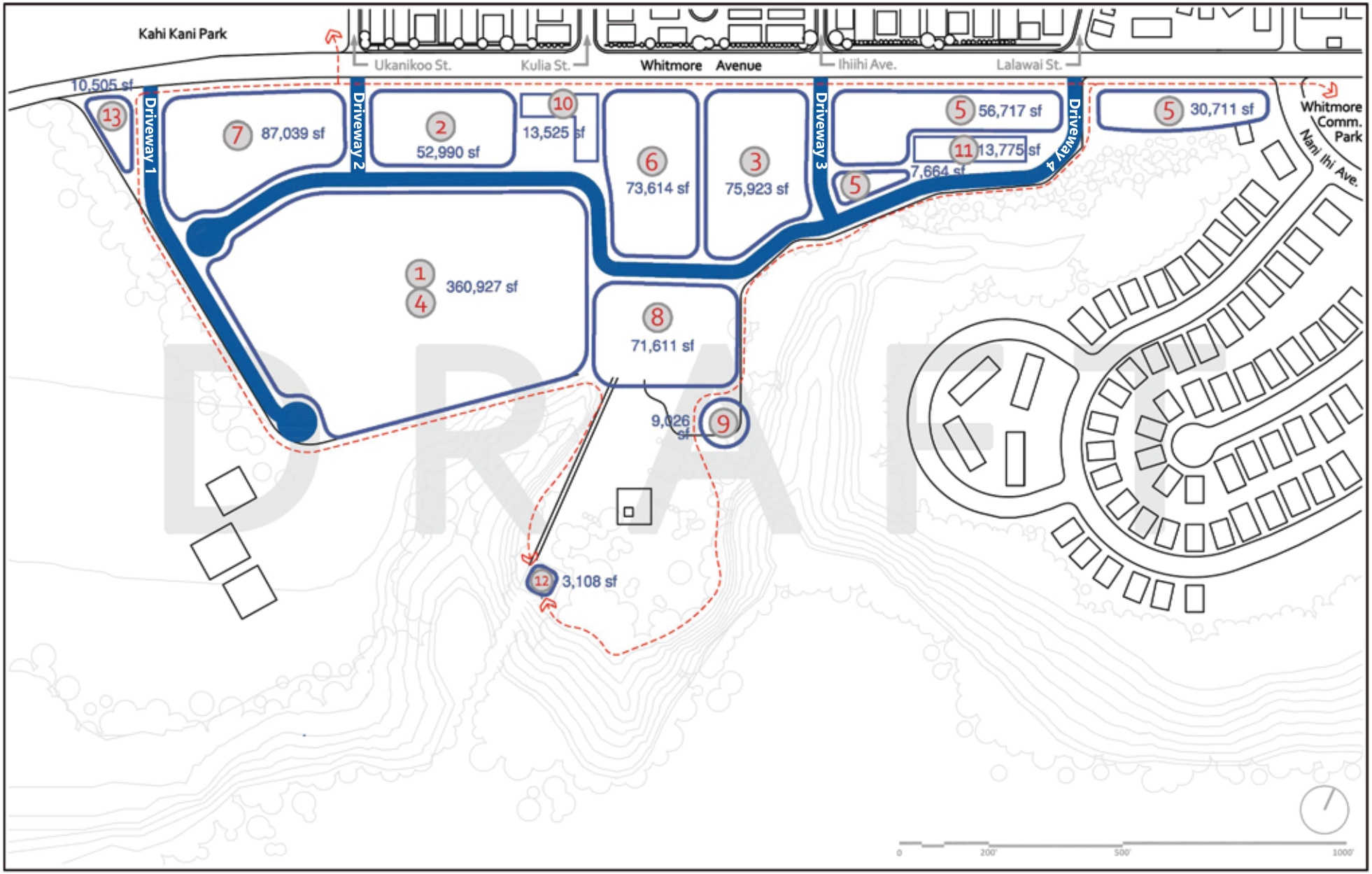
The project location is shown on **Figure 1**. The project site plan is illustrated on **Figure 2**.



Project Site

Figure 1

Project Location



DRAFT 11/09/2018

1. Food Hub and Warehouse
2. Food Hub Visitor Center
3. Anchor Tenant Food Processing
4. Logistics Yard
5. Research and Innovation Node
6. Tenant Food Producer
7. Farmer's Market / Visitor Parking
8. Workforce Housing / Parking
9. Water Storage Tanks and Treatment Ponds
10. Existing Machine Shop - Renovated
11. Existing Outdoor Shed - Renovated
12. Kaukonahua Stream Overlook
13. Whitmore Food Hub Entry Feature

Figure 2
Site Plan

2.2 PROJECT STUDY AREA

Regional access to the proposed project site is provided via Kamehameha Highway. Local access is provided via Whitmore Avenue. The mobility analysis evaluated the operations at seven (7) intersections in the vicinity of the proposed project that are listed below.

1. Whitmore Avenue / Kamehameha Highway (signalized)
2. Whitmore Avenue / Saipan Drive (unsignalized)
3. Whitmore Avenue / Uakaniko'o Street – Driveway 2[1] (unsignalized)
4. Whitmore Avenue / Kulia Street (unsignalized)
5. Whitmore Avenue / Ihiihi Avenue – Driveway 3[1] (unsignalized)
6. Whitmore Avenue / Lalawai Street – Driveway 4[1] (unsignalized)
7. Whitmore Avenue / Driveway 1[1] (across from Kahi Kani Park) (unsignalized)

The analysis included new traffic counts at each study intersection as well as a 24-hour roadway segment count of daily trips along Whitmore Avenue between Saipan Drive and Uakaniko'o Street to understand the current volumes of traffic in the area. The locations of traffic data collection locations are shown on **Figure 3**.

2.3 STUDY SCENARIOS

The study analyzed the potential project-related traffic impacts under typical weekday AM and PM peak hour traffic conditions anticipated at project buildout in the year 2028. The peak hour is defined as the highest one-hour total of traffic between 6:00 am and 9:00 am in the morning and 3:30 pm to 6:30 pm on a weekday.

The operations of the study intersections were evaluated during the weekday AM and PM peak hours for the following scenarios:

- **Existing Conditions** – The analysis of existing traffic conditions was based on 2018 counts collected during weekday peak hours and existing roadway and intersection configurations. The existing conditions analysis also includes an overview of current pedestrian, bicycle, and transit facilities and services near the site.

[1] Project driveways do not currently exist and are proposed with development of the project. As such, the driveways are only analyzed in the Baseline (2028) Plus Project Condition scenario (see Section 6.0).

- **Baseline (2028) Without Project Conditions** – The analysis of future (2028) conditions based on the application of adding ambient growth projections to existing peak-hour volumes. This scenario includes existing roadway and intersection configurations and forms the comparison baseline for identifying with-project impacts.
- **Baseline (2028) With Project Conditions** – The analysis of future (2028) conditions with buildout of the proposed project by adding the forecasted project trips to the Baseline (2028) Without Project volumes. This scenario includes existing roadway and intersection configurations plus the addition of new driveways to serve the proposed project.



Study Intersection

Average Daily Traffic (ADT) Counter

Project Site

Future Driveway

Figure 3

Project Site & Study Intersections

2.4 TRAFFIC ANALYSIS METHODOLOGY

The analysis of roadway operations performed for this study is based on procedures presented in the *Highway Capacity Manual* (HCM), published by the Transportation Research Board in 2016. The operations of roadway facilities are described with the term level of service (LOS). LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, with the least congested operating conditions, to LOS F, with the most congested operating conditions. LOS E represents "at-capacity" operations. Operations are designated as LOS F when volumes exceed capacity, resulting in stop-and-go conditions. The methodologies for signalized and unsignalized intersections are described below.

2.4.1 SIGNALIZED INTERSECTIONS

The method described in Chapter 18 of the *Highway Capacity Manual 6th Edition* was used to prepare the LOS calculations for the signalized study intersection of Kamehameha Highway and Whitmore Avenue. This LOS method analyzes a signalized intersection's operation based on average control delay per vehicle. Control delay alone is used to characterize LOS for the entire intersection or an approach. Control delay includes the initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for signalized intersections is calculated using Synchro 10.0 analysis software and is correlated to a LOS designation as shown in **Table 1**.

2.4.2 UNSIGNALIZED INTERSECTIONS

The operations of the unsignalized intersections of Whitmore Avenue at Saipan Drive, Uakanikoʻo Street Kulia Street, Ihiihi Avenue, Lalawai Street, and Driveway 1 (Baseline (2028) Plus Project Condition scenario only) were evaluated using the method contained in Chapter 19: Two-Way Stop-Controlled Intersections of the *HCM 6th Edition*. LOS ratings for stop-sign-controlled intersections are based on the average control delay expressed in seconds per vehicle. At all-way stop-controlled (AWSC) intersections the overall intersection delay and LOS is reported, and the LOS is characterized solely on control delay. At side-street (SSSC) or two-way stop controlled (TWSC) intersections, the average control delay is calculated for each minor-street stopped movement and the major-street left turns, not for the intersection as a whole. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. For approaches with multiple lanes, the control delay is computed for each movement; the movement with the worst (i.e., longest) delay is presented for TWSC. The average control delay for unsignalized intersections is calculated using Synchro 10.0 analysis software and is correlated to a LOS designation as shown in **Table 2**.

TABLE 1: SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Delay in Seconds
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0
E	This level is considered by many agencies to be the limit of desirable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	This level is considered undesirable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	> 80.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2016.

TABLE 2: UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delay.	≤ 10.0
B	Short traffic delay.	> 10.0 to 15.0
C	Average traffic delays.	> 15.0 to 25.0
D	Long traffic delays.	> 25.0 to 35.0
E	Very long traffic delays.	> 35.0 to 50.0
F	Extreme traffic delays with capacity exceeded.	> 50.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2016.
Notes: [1] For approach-based and intersection-wide assessments, such as that used for AWSC intersections, LOS is defined solely by control delay.

2.4.3 SIGNIFICANT IMPACT CRITERIA

The analysis of Baseline Conditions compares forecasted future operations with conditions when the project is fully built to determine whether or not project implementation is expected to result in a significant impact on the surrounding roadways. Based on previous studies conducted for the City & County of Honolulu DPP TRB, the minimum desired operating standard for a signalized intersection is typically LOS D. Additionally, HDOT, as stated in the 2012 Draft HDOT Best Practices for Traffic Impact Reports, strives to maintain LOS D intersection operations for State facilities, including Kamehameha Highway and Whitmore Avenue. Typically, a significant intersection impact occurs when the operation of an intersection or turning movement changes from LOS D (or better) to LOS E or F. Impacts are also defined to occur when the addition of project traffic worsens delay at locations already operating or projected to operate at LOS E or F by more than five percent (5%). When evaluating intersection operations at any location, other factors are considered in the analysis, such as traffic volumes, volume-to-capacity (V/C) ratios, and potential secondary impacts to pedestrian, bicycle, and transit travel.

Significant impacts are categorized as either a project-related or cumulative impact. If the addition of project traffic is expected to degrade LOS D or better operations to LOS E or F at a signalized intersection, then the project is considered to have a project-specific impact. An impact is considered a cumulative impact at a signalized intersection if the addition of project trips worsens delay at locations with baseline LOS E or F operations.

For unsignalized intersections, the project is determined to have a significant project-specific impact if the addition of project traffic causes an unsignalized intersection to degrade from LOS D or better to LOS E or F and if the peak hour signal warrant is satisfied. An impact is considered a cumulative impact when it adds traffic to a study location that includes a controlled approach that operates at an undesired level (i.e., LOS E or F) and if the peak hour signal warrant is satisfied. The use of the peak hour signal warrant is one indication that an alternate traffic control device may be needed at a study location.

The City & County of Honolulu does not currently have criteria for assessing pedestrian, bicycle, and transit impacts. However, these impacts are generally evaluated based on whether a proposed project would: 1) conflict with existing or planned pedestrian, bicycle, or transit facilities and services, or 2) create substantive walking, bicycling, or transit use demand without providing adequate and appropriate facilities for non-motorized mobility. The existing amenities for pedestrians, bicycles, and transit users were inventoried to evaluate the quality and scope of facilities/services currently in place. The assessments of planned facilities were conducted using information in planning documents, such as the *Oahu Bike Plan (2012)* and the *Central Oahu Sustainable Communities Plan Update (2015)*.

3.0 EXISTING CONDITIONS

This chapter describes the existing mobility network and includes a discussion of current bicycle, pedestrian, and transit facilities located in the project study area. This chapter also includes a discussion of the existing intersection operational analysis and results.

3.1 EXISTING SITE

The 34-acre project site is located makai of Whitmore Avenue and mauka of Kamehameha Highway in Wahiawa on the island of Oahu. The site is bounded by Whitmore Avenue to the north, the Kaukonahua Stream to the south, Ali'i Agriculture Farms to the west, and residential properties along Uwalu Circle and Circle Makai Street to the east. The former Dole Operations Facility site currently has 50 employees and includes the following uses:

- A small agricultural processing facility
- An office building
- A field office
- Three (3) greenhouses
- Four (4) parking sheds
- A machine shop
- Three (3) storage warehouses

3.2 EXISTING TRANSPORTATION FACILITIES

New traffic count data was collected as part of this analysis to identify existing transportation conditions in the vicinity of the proposed project. The existing conditions analysis included an inventory of the street system, assessment of traffic volumes, and determination of operating conditions at the study intersections. Existing pedestrian, bicycle, and public transit service are also described.

3.2.1 EXISTING ROADWAY SYSTEM

The key roadways in the study area are described below.

Whitmore Avenue (Route 804) is the primary local street that traverses an east-west direction and provides access to the project site. Whitmore Avenue is a two-lane minor collector from Kamehameha Highway to

the Naval Reservation entrance. The posted speed limit is 25 miles per hour (mph). The road's right of way ranges from approximately 45 feet to 70 feet with the most constrained portion between Uakaniko'o Street and Lalawai Street. Whitmore Avenue is under the jurisdiction of HDOT. Congestion was not observed during field observations.

Bike Facilities: Bike lanes are not currently provided on Whitmore Avenue. Bicyclists share the roadway or ride in the limited roadway shoulders.

Pedestrian Facilities: Existing pedestrian facilities are limited. Sidewalks are provided along the north side of Whitmore Avenue from Kamehameha Highway to Uakaniko'o Street, providing a pedestrian connection to the bus stops on Kamehameha Highway and at the Whitmore Avenue / Uakaniko'o Street intersection.

Striped crosswalks are currently provided at the following locations:

- Whitmore Avenue / Kamehameha Highway (north and east legs providing access across Kamehameha Highway and Whitmore Avenue)
- Whitmore Avenue / Saipan Drive (north leg providing access across Saipan Drive)
- Whitmore Avenue / Ihiihi Avenue (east leg providing access across Whitmore Avenue)
- Whitmore Avenue / Lalawai Street (north and west legs providing access across Lalawai and Whitmore Avenue)

Kamehameha Highway (Route 80) is the regional connector road within the vicinity of the project site. It is a two-lane principal arterial that extends across central Oahu beginning at the Nimitz Highway junction near Daniel K. Inouye International Airport, circles the island, and ultimately terminates at Pali/Kalanianaole Highway intersection in Kaneohe. The posted speed limit near Whitmore Avenue is 45 mph. Kamehameha Highway is under the jurisdiction of HDOT. The intersection at Whitmore Avenue is controlled by a traffic signal with separated turn lanes. Congestion was not observed during field observations.

Bike Facilities: Bike lanes are not provided on Kamehameha Highway. Bicyclists ride in the shoulder on either side of the road.

Pedestrian Facilities: Existing pedestrian facilities are limited. A sidewalk is provided on the east side of Kamehameha Highway north of Whitmore Avenue to serve the existing bus stop. Crosswalks and pedestrian countdown signals are provided on the east and north legs of the intersection at Whitmore Avenue. No other pedestrian facilities are provided between Whitmore and surrounding areas.

Saipan Drive is a north-south traversing roadway between Kamehameha Highway and Uakaniko'o Street that connects northerly from Whitmore Avenue. It provides a connection from Whitmore Avenue to a NSA

facility and the Naval Computer and Telecommunications Area Master Station Pacific (NCTAMS). The posted speed limit of Saipan Drive is 35 mph. Saipan Drive is under the jurisdiction of CCH. The intersection at Whitmore Avenue is side-street stop controlled on Saipan Drive.

Bike Facilities: Bike lanes are not provided on Saipan Drive

Pedestrian Facilities: Pedestrian facilities are not provided on Saipan Drive. A crosswalk is provided across Saipan Drive at Whitmore Avenue to provide a pedestrian connection between Whitmore Village and Kamehameha Highway.

3.2.2 EXISTING TRANSIT FACILITIES AND SERVICES

TheBus is the main public transportation service on the Island of Oahu, where it served over 63 million riders in the fiscal year of 2017-2018. The bus fleet transports an average of approximately 197,000 daily (weekday) riders via fixed-route, express, and paratransit service[2]. Route 72 is the regular service bus route which passes by the project site along Whitmore Avenue. In the westbound direction, Route 72 starts at the Schofield barracks and travels through Wahiawa, along Whitmore Avenue where it passes immediately adjacent to the project site and terminates at Whitmore Avenue and Nani Ihi Avenue. In the eastbound direction, the Route starts at Whitmore Avenue and Nani Ihi Avenue and terminates at Macomb Road and Wilikina Drive. Route 72 provides connections to Routes 52, 83, and 88A along Kamehameha Highway – less than one mile from the project site.

Routes 52, 83, and 88A connect with Route 72 and provide service from Kamehameha Highway to the following major destinations:

- **Route 52** – provides service to the North Shore, Downtown Honolulu, and the Dole Plantation.
- **Route 83** – provides service to the North Shore, the Dole Plantation, Downtown Honolulu and the University of Hawaii. Traveling along the H2 freeway for much of its route, Route 83 provides an express connection to downtown Honolulu.
- **Route 88A** – provides peak hour loop service from the North Shore east along the Kamehameha Highway and Kahekili Highway to Downtown Honolulu and continues north west to the project site, the Dole Plantation and the North Shore.

The existing transit schedules around the study area are summarized in **Table 3**.

[2] TheBus.org (http://www.thebus.org/Performance/Bus/Fixed%20Route%20-%20%20%20%2010-2018%20Performance.pdf)

TABLE 3: EXISTING TRANSIT SERVICE

Route	From	To	Weekdays			Weekends	
			Operating Hours	Headway (Minutes)		Operating Hours	Headway (Minutes)
				Peak	Midday		
72	Schofield Barracks/ Whitmore Avenue and Nani Ihi Avenue	Whitmore Avenue and Nani Ihi Avenue/ Macomb Road and Wilikina Drive	5:10 AM to 9:15 PM	70 min	90 min	7:20 AM to 12:40 AM	75 min
52	Ala Moana Center/ Weed Circle	Haleiwa Beach Park/ Ala Moana Center	4:10 AM to 2:20 AM	30 min	30 min	4:00 AM to 12:10 AM	40 min
83	Weed Circle/ Alapai Transit Center	University of Hawaii/ Weed Circle	5:00 AM to 7:20 AM and 3:40 PM to 7:00 PM	20 min	None	None	
88A	Aiea/Ala Moana Center	Ala Moana Center/ Downtown	3:50 AM to 7:00 AM and 4:30 PM to 8:10 PM	30 min	None	None	

Source: TheBus.org, 2018.

Table 4 summarizes the bus stops in the project area, the routes served at each stop, existing average daily ridership, and amenities. As shown, the daily ridership reflects a moderate amount of activity at all stops except for stops 2792, 2805, and 2795. **Figure 4** illustrates the bus routes and the locations of each stop in relation to the project site.

TABLE 4: EXISTING TRANSIT STOP RIDERSHIP AND AMENITIES

Transit Stop Location	Stop ID	Routes Served	Daily Average Ridership			Available Amenities
			On	Off	Total	
NB Kamehameha Highway/ Whitmore Avenue	2185	52, 83, 88A	12	26	37	Bench, Shelter
SB Kamehameha Highway/ Whitmore Avenue	2211	52, 83, 88A	17	12	30	Bench, Shade Trees
EB Whitmore Avenue/ Kamehameha Highway	2792	72	0	0	0	Bench
WB Whitmore Avenue/ Kamehameha Highway	2805	72	0	2	2	None
EB Whitmore Avenue/ Kulia Street	2793	72	0	28	28	None
WB Whitmore Avenue/ Kulia Street	2803	72	7	1	8	Bench
EB Whitmore Avenue/ Ihiihi Avenue	2794	72	0	33	33	None
WB Whitmore Avenue/ Naniihi Avenue	2795	72	0	0	0	None
WB Whitmore Avenue/ Ehoeho Avenue	2801	72	38	25	63	Bench, Shelter, Trash Receptacle
WB Whitmore Avenue/ Lalawai Street	2802	72	18	0	18	Bench, Shelter
WB Whitmore Avenue/ Uakanikoo Street	2804	72	19	0	19	Bench, Shelter

Source: TheBus.org, 2018.



Bus Stop Project Site

Figure 4

Existing Transit Facilities

3.2.3 EXISTING BICYCLE ACTIVITY

Based on peak period counts conducted, four (4) bicyclists were observed on Whitmore Avenue during the AM peak hour. During the PM peak hour, one (1) bicyclist was observed on Kamehameha Highway turning onto Whitmore Avenue and seven (7) bicyclists were observed on Whitmore Avenue.

3.2.4 EXISTING PEDESTRIAN ACTIVITY

Pedestrian counts collected during the peak periods showed that the highest volumes of pedestrians crossing at a study intersection occurred during the AM peak hour with 21 people crossing at the Kamehameha Highway/Whitmore Avenue intersection at 7:00 AM. Most pedestrians were crossing Kamehameha Highway on the north side of the intersection between the bus stop on the west side of Kamehameha Highway to the bus stop on the north side of Whitmore Avenue to board Route 72.

Less pedestrian activity was observed along Whitmore Avenue, which included six (6) pedestrians during the AM peak hour and three (3) pedestrians during the PM peak hour at the study intersections along Whitmore Avenue. The transit ridership shown in Table 4 reflects moderate levels of pedestrians walking to and from the bus stops in Whitmore Village throughout the day.

3.3 EXISTING TRAFFIC VOLUMES AND LANE CONFIGURATIONS

Existing lane configurations and traffic signal controls were obtained through field observations. The operations of the existing intersections were evaluated during weekday AM and PM peak periods (6:00 AM – 9:00 AM and 3:30 PM – 6:30 PM). Traffic counts were collected during the weekday AM and PM peak periods at the study intersections in October 2018 under normal traffic and weather conditions. The weekday AM peak hour of traffic for the study area generally occurred between the hours of 7:00 AM to 8:00 AM. During the weekday afternoon, the PM peak hour of traffic generally occurred between the hours of 3:30 PM to 4:30 PM.

A 24-hour daily traffic volume was collected on Whitmore Avenue between Saipan Drive and Uakaniko'o Street. The daily volume of traffic along this portion of Whitmore Avenue in both directions was 11,189 trips.

Figure 5 presents the existing AM and PM peak hour turning movement volumes, corresponding lane configurations, and traffic control devices. Peak hour intersection and daily roadway traffic count data are provided in **Appendix A**.



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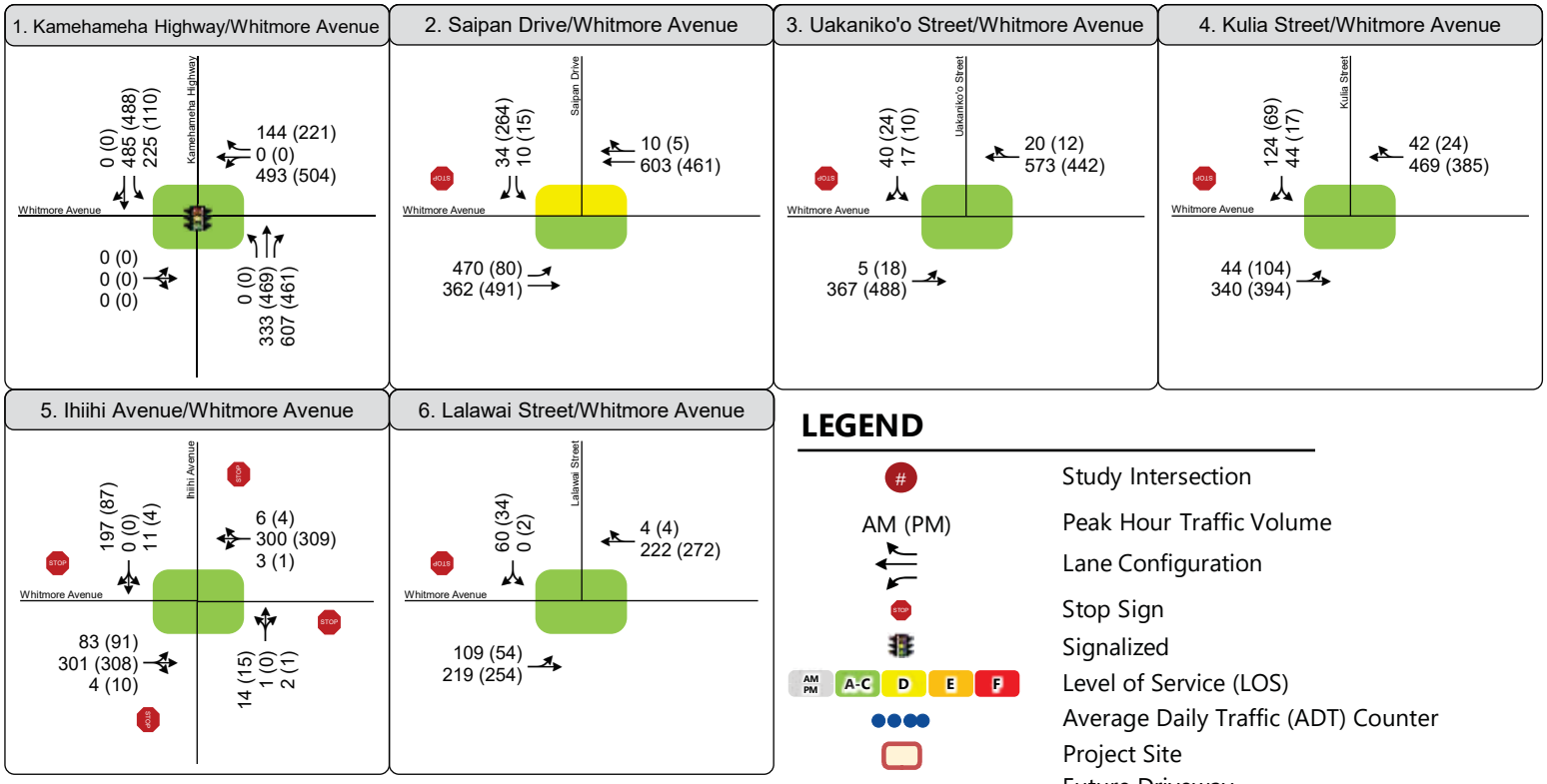


Figure 5

Existing (2018) Peak Hour and Daily Traffic Volumes and Geometries

3.4 EXISTING INTERSECTION LEVELS OF SERVICE

Peak hour intersection LOS analysis was performed for the existing study intersections using the methodology described previously and traffic count data collected for this study. **Table 5** shows the results for Existing Conditions LOS. Detailed LOS Worksheets are provided in **Appendix B**.

TABLE 5: EXISTING (2018) INTERSECTION LEVELS OF SERVICE (LOS)

Intersection	Traffic Control	Peak Hour	Delay (sec/veh) [1]	LOS
1. Whitmore Avenue / Kamehameha Hwy	Signalized	AM	25.2	C
		PM	22.8	C
2. Whitmore Avenue/ Saipan Drive	SSSC	AM	32.2	D
		PM	15.1	C
3. Whitmore Avenue/ Uakaniko'o Street	SSSC	AM	16.6	C
		PM	14.8	B
4. Whitmore Avenue/ Kulia Street	SSSC	AM	23.6	C
		PM	14.5	B
5. Whitmore Avenue/Ihiihi Avenue	AWSC	AM	16.6	C
		PM	12.1	B
6. Whitmore Avenue/Lalawai Street	SSSC	AM	10.3	B
		PM	10.5	B

Source: Fehr & Peers, 2018

Notes: SSSC = Side Street Stop Controlled AWSC = All Way Stop Controlled

[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized and all-way stop-controlled intersections. The vehicular delay for the worst movement is reported for side-street stop-controlled intersections.

As shown in **Table 5**, all study intersections currently operate at LOS D or better during the AM and PM peak hours with the highest delay occurring at Whitmore Avenue/Saipan Drive in the AM peak hour. It should be noted that: 1) the volume experiencing this delay is ten vehicles in the AM peak hour and 15 vehicles in the PM peak hour, and 2) these vehicles have a refuge area to allow a two-stage turn onto eastbound Whitmore Avenue. Excessive delays were not observed during field visits to the site.

4.0 BASELINE (2028) WITHOUT PROJECT CONDITIONS

The project is anticipated to be built out by future year 2028. To evaluate the potential impacts of traffic generated by the proposed project on the surrounding street system, estimates of future traffic conditions in the area were first developed as the Baseline (2028) Without Project condition. Future traffic conditions without the project reflect forecasted traffic increases due to regional growth and development. Estimated project-generated trips were added to the Baseline Without Project volumes to identify potential impacts on the roadway system.

4.1 BASELINE (2028) WITHOUT PROJECT TRAFFIC ESTIMATES

The following section summarizes the growth assumptions used to estimate the amount of traffic added to existing intersection volumes to develop the Baseline (2028) Without Project Conditions.

4.1.1 AREAWIDE OR AMBIENT TRAFFIC GROWTH

Historic traffic counts and regional travel demand model data were reviewed to determine appropriate growth factors for Kamehameha Highway and Whitmore Avenue. Initially, historic HDOT traffic counts of the roadway system in the study area from 2013 through 2016 were compared to identify the amount of growth for this area in the near term. Review of these volumes did not reveal a clear trend in the roadway system growth due to inconsistent traffic data information. The study area was expanded to include a segment of Route 99 north of the Kamehameha Highway interchange. Upon review of the data from Kamehameha Highway north and south of Whitmore Avenue, a conservative one and half percent (1.5%) annual growth factor was applied to the north and southbound through movements on Kamehameha Highway. The growth factor on Whitmore Avenue was tempered by the base year (2012) and future year (2040) forecasts from the Oahu Metropolitan Planning Organization Regional Travel Demand Model which predicted an annual decrease in traffic. Ultimately, a conservative one percent (1%) annual growth factor was applied to traffic from Whitmore Avenue and traffic turning onto Whitmore Avenue from Kamehameha Highway. This growth rate was compounded over the ten-year timeframe (2018 to 2028) when full development of the proposed project is anticipated.

4.1.2 FUTURE TRANSPORTATION IMPROVEMENTS

No planned or approved transportation infrastructure improvements are anticipated in the immediate study area by the baseline year (2028). Therefore, the intersection lane configurations and traffic control devices are expected to remain the same as under Existing Conditions.

Figure 6 shows the peak hour traffic volumes for the Baseline (2028) Without Project Conditions.

4.2 BASELINE (2028) WITHOUT PROJECT LEVELS OF SERVICE

Levels of service (LOS) calculations were conducted to evaluate operations at the study intersections under Baseline (2028) Without Project Conditions based on the anticipated growth in traffic and existing roadway geometries. The results of the LOS analysis are presented in **Table 6.** The corresponding LOS calculation sheets are included in **Appendix B.**

The analysis indicates that most study intersections are expected to operate at desirable levels of service (LOS D or better) under Baseline (2028) Without Project Conditions. In the AM Peak Hour, the southbound left-turn movement at the Whitmore Avenue / Saipan Drive intersection is expected to operate at an undesirable level of service LOS E. The forecasted change in operations from Existing Conditions (LOS D) for this movement is the result of the addition of the anticipated growth in ambient through traffic on Whitmore Avenue. It should be noted that: 1) the volume experiencing this delay is 20 vehicles during each of the peak commute hours, and 2) these vehicles have a refuge area to allow a two-stage turn onto eastbound Whitmore Avenue,

TABLE 6: BASELINE (2028) WITHOUT PROJECT INTERSECTION LEVELS OF SERVICE

Intersection	Traffic Control[1]	Peak Hour	Existing Delay (sec/veh)[1]	Existing LOS[2]	2028 Baseline Delay (sec/veh)[1]	2028 Baseline LOS[2,3]	Δ Delay
1. Whitmore Avenue/ Kamehameha Highway	Signal	AM	25.2	C	34.4	C	9.2
		PM	22.8	C	35.3	D	12.5
2. Whitmore Avenue/ Saipan Drive	SSSC	AM	32.2	D	**42.0**	**E**	9.8
		PM	15.1	C	16.1	C	1.0
3. Whitmore Avenue/ Uakaniko'o Street	SSSC	AM	16.6	C	18.6	C	2.0
		PM	14.8	B	17.7	C	2.9
4. Whitmore Avenue/ Kulia Street	SSSC	AM	23.6	C	24.5	C	0.9
		PM	14.5	B	16.8	C	2.3
5. Whitmore Avenue/ Ihiihi Avenue	AWSC	AM	16.6	C	17.7	C	1.1
		PM	12.1	B	14.8	B	2.7
6. Whitmore Avenue/ Lalawai Street	SSSC	AM	10.3	B	10.3	B	0.0
		PM	10.5	B	11.7	B	1.2

Source: Fehr & Peers, 2018
Notes: SSSS = Side Street Stop Controlled AWSC = All Way Stop Controlled

[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized and all-way stop-controlled intersections. The vehicular delay for the worst movement is reported for side-street stop-controlled intersections.

[2] LOS calculations performed using the Highway Capacity Manual (HCM) method.

[3] Undesirable seconds of delay per vehicle and LOS highlighted in **bold**.



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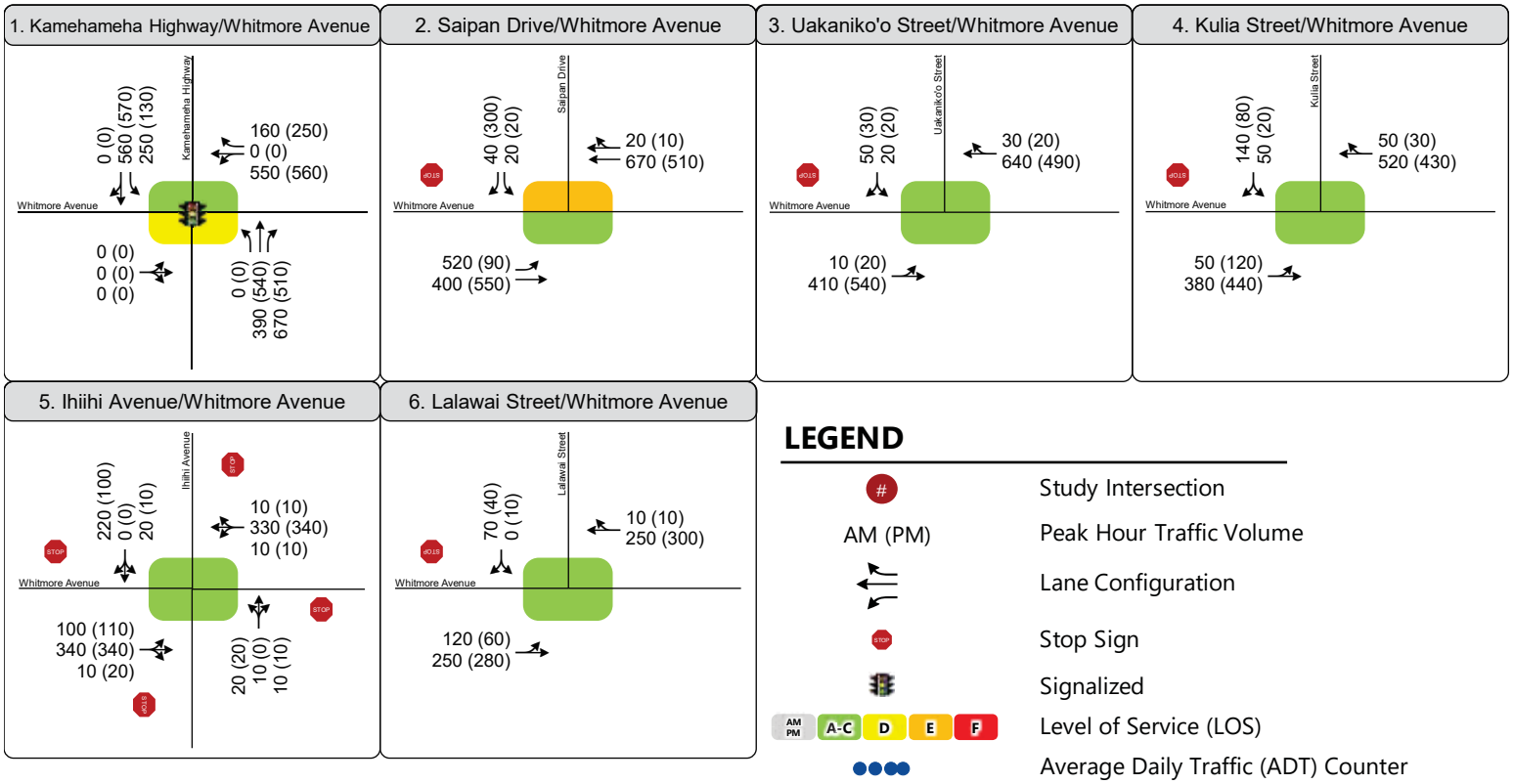


Figure 6

Baseline (2028) Without Project Peak Hour Traffic Volumes and Geometries

5.0 PROJECT TRAFFIC ESTIMATES

This section describes the traffic volumes and travel patterns forecasted to be added to the study area by the proposed project. Future project-generated traffic added to the roadway system was estimated using a three-step process: (1) project trip generation, (2) project trip distribution, and (3) project trip assignment. Trip generation estimates the amount of project-generated traffic that would be added to the roadway network based on the proposed land uses. Trip distribution estimates the direction of travel to and from the project site. Trip assignment distributes the forecasted project trips onto the roadway network.

5.1 PROJECT TRIP GENERATION

Trip rates presented in *Trip Generation 10th Edition* (ITE, 2017) were used to estimate the number of trips forecasted to be generated by the proposed land uses. The trip rates applied to this project are summarized in **Table 7** and provided in **Appendix C**.

TABLE 7: TRIP GENERATION RATES

			AM Peak Hour			PM Peak Hour		
Land Use	**Units[1]**	Daily Rate	Total	Inbound	Outbound	Total	Inbound	Outbound
Workforce Housing (Microapartments) [Multi-Family Housing (Mid-Rise) - 221]	DU	5.44	0.36	0.09	0.27	0.44	0.27	0.17
Research & Innovation Hub [Research & Development Center - 760]	KSF	19.38	0.42	0.32	0.11	0.49	0.07	0.42
Food Hub + Warehouse / Logistics Yard [Warehousing - 150]	KSF	1.71	0.19	0.15	0.04	0.20	0.05	0.14
Farmer's Market [Supermarket - 850]	KSF	106.78	3.82	2.29	1.53	9.24	4.71	4.53
Anchor Tenant Food Processing and Tenant Food Producer [General Light Industrial - 110]	KSF	4.75	0.52	0.45	0.06	0.43	0.06	0.38
Food Hub Visitor Center [Winery - 970]	KSF	45.96	2.07	1.45	0.62	7.31	3.66	3.66

Source: *Trip Generation 10th Edition* (ITE, 2017)
Notes: [1]DU =dwelling units, KSF = 1,000 square feet

Due to the nature of providing a variety of uses within a project, the project's trip generation estimates were developed using MainStreet, a web application developed by Fehr & Peers that uses a Mixed-Use (MXD) Trip Generation Model. The MXD model was developed by Fehr & Peers and the Environmental Protection Agency (EPA) and is based on statistically superior data compared to the methodology used by ITE. The model recognizes that traffic generation by mixed-use and other forms of sustainable development relate closely to the density, diversity, design, destination, accessibility, travel proximity, and scale of development. The model estimates the percentage of daily and peak hour trips that remain on the project site (internal capture), as well as external transit, walk, bicycle, and vehicle mode splits. Based on this approach, the trip generation includes the forecasted volume of peak hour and daily trips to be generated by the site, as well as trip reductions associated with the mixed-use nature of the project.

The following data points (and sources) were applied in the MXD model to calculate trip reduction:

- Employment within one mile and within 30 minutes by transit (*EPA Smart Location Database, 2013*)
- Surrounding Household Size (*ACS, 2012*)
- Vehicle Ownership (*ACS, 2012*)
- Intersection Density (*EPA Smart Location Database, 2013*)
- Surrounding Household Size (*ACS, 2012*)
- Auto Trip Lengths (*Census Divisions, 2009*)
- Average Vehicle Occupancy (*NCHRP 758*)

Existing trips currently generated by land uses on the site were also reduced from the forecasted trip generation to accurately account for net new trips that will replace the current traffic activity. In addition, a reduction was applied to the proposed workforce housing due to the expectation that fifty percent (50%) of the workforce housing will be reserved for and occupied by employees of the Whitmore Community Food Hub. The other fifty percent (50%) may be occupied by employees of smaller farms throughout Central Oahu. Whitmore Community Food Hub employee residents will be on-site to walk to and from work, and therefore will not be commuting to work by car. Based on the daily trip rate for an apartment (6 trips per dwelling unit), a 33% reduction was applied to the daily and peak hour calculations to account for the elimination of commuter trips for fifty percent (50%) of the workforce housing residents. No reductions were made for the fifty percent (50%) of off-site workforce housing residents.

Based on the trip generation rates shown in **Table 7** and associated reductions described above, the forecasted project trip generation for the proposed project is summarized in **Table 8**.

TABLE 8: FORECASTED PROJECT TRIP GENERATION

				AM Peak Hour			PM Peak Hour		
Land Use	**Size**	**Units[1]**	**Daily Trips**	**Total**	**Inbound**	**Outbound**	**Total**	**Inbound**	**Outbound**
Workforce Housing (Microapartments)	100	DU	544	36	9	27	44	27	17
Research & Innovation Node	22.4	KSF	434	9	7	2	11	2	9
Food Hub and Warehouse / Logistics Yard[2]	360	KSF	614	69	53	16	71	19	52
Farmer's Market[3]	6	KSF	641	23	14	9	55	28	27
Anchor Tenant Food Processing and Tenant Food Producer	60	KSF	285	31	27	4	26	3	23
Food Hub Visitor Center	10	KSF	460	21	14	6	73	37	37
Subtotal Project Trip Generation			**2,977**	**189**	**125**	**64**	**280**	**116**	**165**
Reductions									
33 percent (33%) trip reduction for 50 on-site employees[4]			-90	-6	-2	-4	-7	-4	-3
Internal Capture[5]			-40	-10	-7	-3	-6	-2	-4
Walk/Bike/Transit Trips[5]			-74	-9	-6	-3	-15	-6	-9
Existing land use trips[6]			-195	-26	-7	-19	-13	-11	-2
Subtotal Reductions			*-399*	*-51*	*-21*	*-30*	*-41*	*-24*	*-17*
Total Net New Project Trips			**2,578**	**138**	**104**	**34**	**239**	**92**	**147**

Source: Fehr & Peers, 2018.
Notes: [1]DU =dwelling units, KSF = 1,000 square feet
[2]Trips associated with proposed Logistics Yard are included in the warehouse trip generation rate shown.
[3]Farmers Market will be open daily
[4]Half of the workforce housing units are expected to be occupied by employees working on-site. A 33% trip reduction was applied to half of the dwelling units for on-site employees who will not commute to the project site.
[5]Internal capture and active/transit trip reductions calculated using MainStreet web app (see text for details).
[6]Existing trips generated by the current project site. Based on peak hour traffic volumes and the assumption that the peak hour volumes represent 20 percent (20%) of the site's daily trip generation.

As shown in **Table 8**, the project is forecasted to generate 2,578 net new daily vehicle trips, 138 net new AM peak hour trips (104 inbound/34 outbound), and 239 net new PM peak hour trips (92 inbound/147 outbound).

5.2 PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of traffic forecast to be generated by the project onto the roadway system was based on surrounding land uses and existing traffic patterns. Based on these factors, the vehicle trip distribution of the project traffic is estimated to include:

- 30 percent (30%) to/from the North on Kamehameha Highway
- 55 percent (55%) to/from the South on Kamehameha Highway
- Five percent (5%) to/from the East on Whitmore Avenue
- Ten percent (10%) to/from Whitmore Village residential north of Whitmore Avenue (distributed throughout the cross streets with one percent (1%) to/from Uakaniko'o Street, four percent (4%) to/from Kulia Street, two percent (2%) to/from Ihiihi Avenue, and three percent (3%) to/from Lalawai Street)

Figure 7 illustrates the proposed project trip distribution pattern.

Due to the prevalence of densely populated communities to the south of the project, the majority of the project trips will travel on Kamehameha Highway south of Whitmore Avenue to access the project site. The portion of trip distribution to/from the north reflects existing development patterns as well as the anticipated volume of trips associated with tourism to/from Dole Plantation and the North Shore.

The forecasted trip generation and trip distribution were combined to determine the project related trip assignment and peak hour turning movement volumes at the study intersections. **Figure 8** shows the project trip assignment for AM and PM peak hours.



Study Intersection

Average Daily Traffic (ADT) Counter

Project Site

Figure 7

Project Trip Distribution



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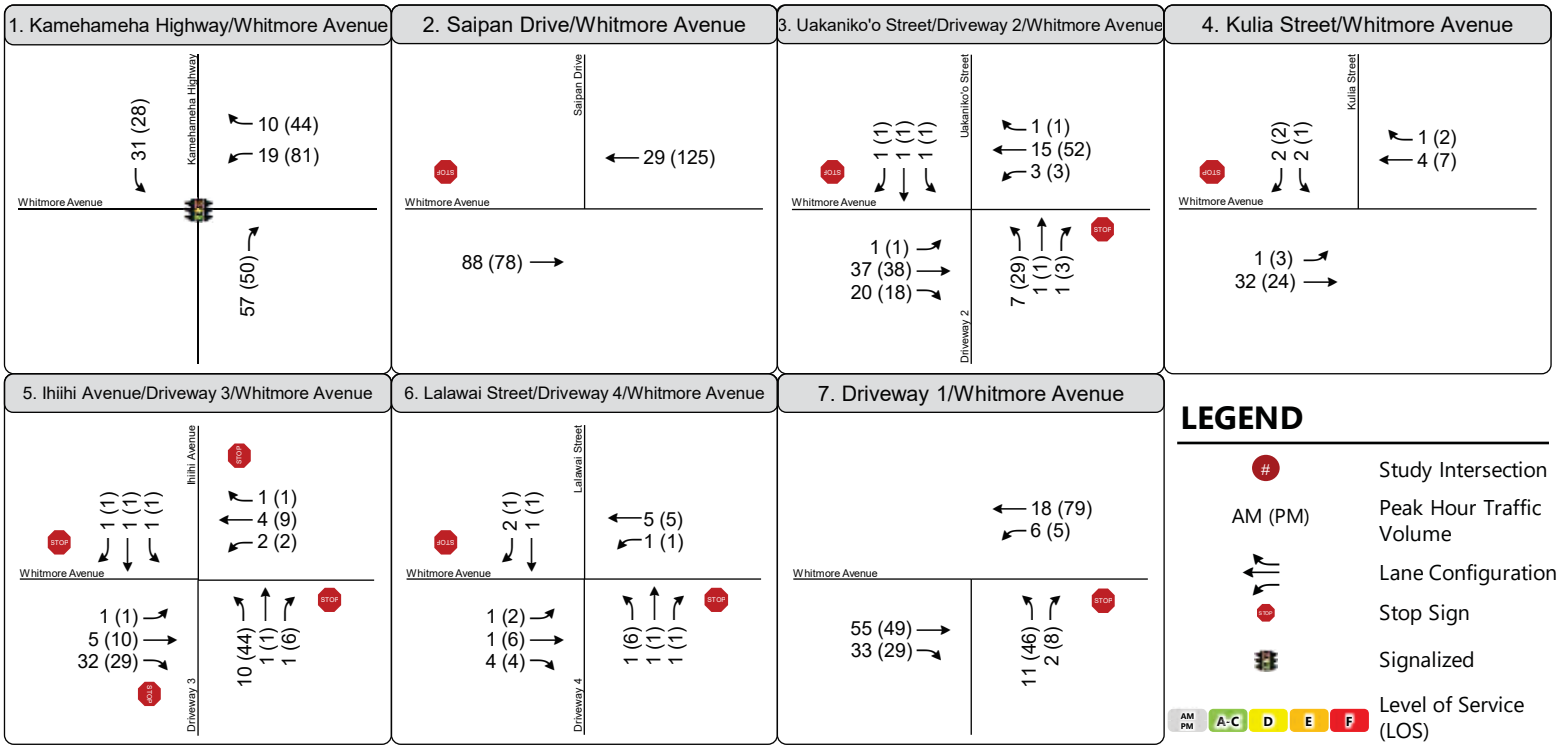


Figure 8

Project Trip Assignment

6.0 BASELINE (2028) PLUS PROJECT CONDITIONS

The proposed Whitmore Community Food Hub Complex is intended to be developed incrementally as demand arises. For the purposes of this analysis, buildout was assumed to occur by 2028. This section presents the analysis of Baseline (2028) Plus Project conditions. The Baseline (2028) Plus Project roadway network is the same network assumed under the Baseline (2028) Without Project scenario, with the exception of new project-related driveway access on Whitmore Avenue. The analysis compares the project levels of service at each study intersection for future conditions without and with the addition of project-generated trips.

6.1 PROPOSED PROJECT DRIVEWAY ACCESS

The project proposes to construct four new driveways on Whitmore Avenue to access the site:

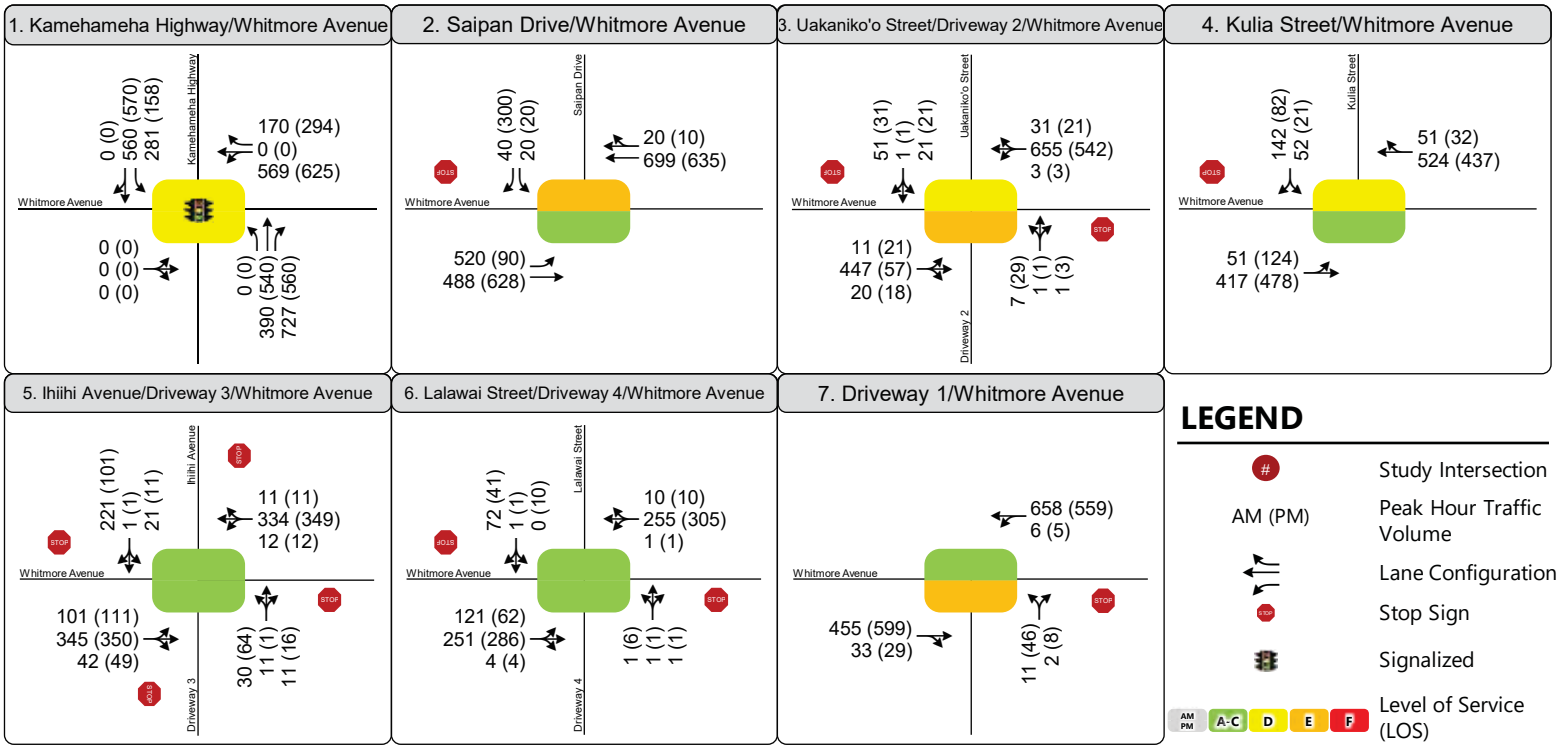
- Driveway 1: Whitmore Avenue across from Kahi Kani Park (side street stop controlled)
- Driveway 2: Whitmore Avenue/Uakaniko'o Street (side street stop controlled)
- Driveway 3: Whitmore Avenue/Ihiihi Avenue (all way stop controlled)
- Driveway 4: Whitmore Avenue/Lalawai Street (side street stop controlled)

Driveways 2, 3, and 4 are proposed to be aligned with the existing intersection configurations and are anticipated to maintain existing unsignalized traffic controls. Driveway 1 will be a new intersection that will not align with an existing intersection and is anticipated to be unsignalized/side-street stop controlled. Driveway 1 is a new driveway proposed between Saipan Drive and Uakaniko'o Street intended to serve the food hub and warehouse, including truck and employee trips only associated with the food hub/warehouse and logistics yard.

6.2 BASELINE (2028) WITH PROJECT INTERSECTION LEVEL OF SERVICE

To forecast the peak hour operating conditions at the study intersections after the project is constructed and operational, the project trip assignment was applied to the Baseline (2028) Without Project traffic volumes to yield Baseline (2028) With Project volumes. **Figure 9** illustrates the Baseline (2028) With Project AM and PM peak hour volumes at each study intersection. The Baseline (2028) With Project condition includes full buildout of the project.





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Figure 9

Baseline (2028) With Project Peak Hour Traffic Volumes and Geometries

Driveway 1 (intersection #7) is anticipated to provide employee and truck access to the food hub and warehouse area. As a conservative approach to account for truck trips and the typically slower speeds of trucks, half of the project trips at Driveway 1 were doubled in the operational analysis. The results of the LOS analysis for the study intersections are presented in **Table 9**. Detailed LOS results and calculation worksheets are provided in **Appendix B**.

TABLE 9: BASELINE (2028) WITHOUT AND WITH PROJECT INTERSECTION LEVELS OF SERVICE

Intersection	Traffic Control	Peak Hour	Baseline (2028) Without Project		Baseline (2028) With Project		Δ Delay (%)
			Delay (sec/veh)[1]	LOS[2]	Delay (sec/veh)[1]	LOS[2]	
1. Kamehameha Hwy/ Whitmore Avenue	Signal	AM	34.4	C	43.1	D	
		PM	35.3	D	51.4	D	
2. Whitmore Avenue/Saipan Drive	SSSC	AM	**42.0**	**E**	**47.7**	**E**	14%
		PM	16.1	C	18.5	C	
3. Whitmore Avenue/Uakaniko'o Street – Driveway 2	SSSC	AM	18.6	C	31.6	D	
		PM	17.7	C	38.7	**E**	**119%**
4. Whitmore Avenue/Kulia Street	SSSC	AM	24.5	C	26.6	D	
		PM	16.8	C	17.9	C	
5. Whitmore Avenue/Ihiihi Avenue – Driveway 3	AWSC	AM	17.7	C	21.7	C	
		PM	14.8	B	19.0	C	
6. Whitmore Avenue/Lalawai Street – Driveway 4	SSSC	AM	10.3	B	16.2	C	
		PM	11.7	B	17.3	C	
7. Whitmore Avenue/Driveway 1 (West of Uakaniko'o Street)	SSSC	AM	N/A	N/A	24.8	C	
		PM	N/A	N/A	37.8	**E**	

Source: Fehr & Peers, 2018.
Notes:
SSSC = Side street stop-controlled AWSC = All way stop-controlled
[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized and all-way stop-controlled intersections. The vehicular delay for the worst movement is reported for side-street stop-controlled intersections.
[2] LOS calculations performed using the *Highway Capacity Manual (HCM) 2016* method. LOS for side street stop-controlled (SSSC) intersections is worst-case movement.
[3] Undesirable delay in seconds per vehicle and LOS highlighted in **bold**.
[4] With the addition of a northbound driveway at this intersection, the reflected side street delay changes from the southbound approach in the Existing condition to the northbound approach in the Baseline (2028) With Project condition.

As shown in **Table 9**, four (4) of the seven (7) study intersections are projected to operate at desirable levels of service with the proposed project in place. At Whitmore Avenue/Saipan Drive and Whitmore Avenue/Uakaniko'o Street – Driveway 2, which are both side-street stop controlled, the potential impacts are due to the increase in traffic volume on Whitmore Avenue and associated increase in delays for the side-street traffic. At Whitmore Avenue/Driveway 1 (West of Uakaniko'o Street) potential impacts are due to the addition of project traffic from the side street (Driveway 1) onto Whitmore Avenue. This future driveway is proposed to be side-street stop controlled.

6.3 POTENTIAL TRAFFIC IMPACTS AND RECOMMENDED IMPROVEMENTS

Based upon HDOT and TRB significance criteria and the results of the operations analysis, ambient traffic growth in the study area without development of the project is expected to result in LOS E operations at the intersection of Whitmore Avenue/Saipan Drive during the AM peak hour. All other study intersections are forecast to operate at LOS D or better during Baseline (2028) Without Project Conditions.

As shown in the Baseline (2028) With Project Condition analysis, buildout of the proposed project is forecast to increase delay to undesirable levels at:

- Int. 2 - Whitmore Avenue/Saipan Drive (LOS E for southbound left-turn in the AM peak hour)
- Int. 3 - Whitmore Avenue/Uakaniko'o Street-Driveway 2 (LOS E for northbound approach in the PM peak hour)
- Int. 7 - Whitmore Avenue/Driveway 1 (LOS E for northbound approach in the PM peak hour)

The impacted intersections are all currently side street stop-controlled, where traffic along Whitmore Avenue is not required to stop. The project proposes to construct new driveways on the south side of Whitmore Avenue opposite Uakaniko'o Street and between the Saipan Drive and Uakanikoo Street intersections (Driveway 1) where none currently exist.

The addition of eastbound and westbound through project trips along Whitmore Avenue is expected to increase delay to undesirable level for the southbound left turn movement at the Whitmore Avenue/Saipan Drive intersection. The forecasted delay would also exceed the minimum desired level at the Whitmore Avenue/Uakaniko'o Street – Driveway 2 intersection for northbound left-turning vehicles departing the project site. The forecasted delay at the Whitmore Avenue/Driveway 1 intersection is also expected to be at an undesirable level for the northbound left turn movement. Delay on minor streets approaches at side-street stop-controlled intersections is common, and in this case the affected side street volumes are relatively low (ranging from 2 to 86 vehicles during the peak hour).

In general, implementing all-way stops at both impacted project driveway intersections would reduce the delay for vehicles on each side street by providing gaps in through traffic on Whitmore Avenue, and all locations are projected to operate at an overall LOS D or better during both peak periods. However all-way stops are unlikely to be favored by the community and DOT due to the additional delay that would be incurred by through traffic on Whitmore Avenue. Alternatively, installation of traffic signals at each of the impacted intersections would provide desirable operating levels for all movements; however, it is highly unlikely that signal warrants would be met given the relatively low volumes on each side street approach

and would also unnecessarily delay vehicles on Whitmore Avenue. The minimum volume for a four-hour volume signal warrant is 115 vehicles during each of the four highest hours of the day, and the highest peak hour volume that would benefit from a signal is only 86 vehicles at the Driveway 1 intersection.

Accordingly, potential improvements were explored for each impacted intersection to possibly reduce side street delay and enhance future operations. Adaptations to the assumed lane configurations on **Figure 9** were investigated to determine if intersection improvements would alleviate the forecasted delay. The adapted scenarios and results are described below.

- **Whitmore Avenue/Saipan Drive**
  Impact: Southbound left-turn movement of 20 vehicles is projected to experience LOS E operations in AM peak hour
  Adaptation: No feasible striping modification is possible here. To minimize delay for this movement, install stop signs on Whitmore Avenue (i.e., convert to all-way stop control) to provide increased gaps in through traffic.
  Result: Installation of stop signs on Whitmore Avenue would provide LOS D in AM peak hour operations but would result in increased delay to eastbound/westbound through traffic that does not currently stop.
  Recommendation: LOS E operations for traffic on a side street is not unreasonable (especially for 20 vehicles), and the existing refuge lane minimizes delay for the southbound left-turn movement. In addition, potential additional traffic growth in this corridor is limited given that Whitmore Avenue is essentially a long cul-de-sac-type street. Thus, no improvement is recommended at this time.

- **Whitmore Avenue/Uakaniko'o Street-Driveway 2**
  Impact: Northbound left-turn movement of 29 vehicles is projected to experience LOS E operations in PM peak hour
  Adaptation: No feasible striping modification or lane widening on the project site frontage is possible here. To minimize delay for this movement, install stop signs on Whitmore Avenue (i.e., convert to all-way stop control) to provide increased gaps in through traffic.
  Result: Installation of stop signs on Whitmore Avenue would provide LOS D PM peak hour operations but would result in increased delay to eastbound/westbound through traffic that does not currently stop.

  Adaptation: Provide a separate northbound left-turn lane and a separate eastbound right-turn lane.
  Result: The addition of separate turn lanes would not reduce delay for the northbound left-turn movement and are not needed from an operational perspective.

  Recommendation: LOS E operations for traffic on a side street is not unreasonable especially for locations where a traffic signal is not warranted. In addition, potential additional traffic growth in

this corridor is limited given that Whitmore Avenue is essentially a long cul-de-sac-type street. Thus, no improvement recommended at this time. All-way stop control should be installed in the future at the expense of the project applicant based on requirement from DOT.

- **Whitmore Avenue/Driveway 1**

  Impact: Northbound left-turn movement of 46 vehicles is projected to experience LOS E operations in PM peak hour. Of this total, a conservative half (or 23 PM peak hour trips) are assumed to be trucks, which are slower moving vehicles upon initial acceleration and require longer distances to decelerate prior to turning. To account for truck activity, the traffic operations analysis doubled the truck trips at Driveway 1. The lane configuration at Driveway 1 was assumed to include shared lanes on each approach.

  Adaptation: Provide a separate eastbound right-turn lane and a westbound refuge lane for northbound left-turning vehicles to turn onto Whitmore Avenue.

  Result: With the separate lanes noted above, the northbound approach would operate at LOS C during the PM peak hour.

  Recommendations: Given the anticipated presence of truck traffic at Driveway 1, Whitmore Avenue should be widened in the vicinity of the driveway to provide the following elements:

  - Provide a westbound refuge lane on Whitmore Avenue west of Driveway 1 (for northbound left-turning vehicles) with a minimum length of 75 feet plus taper.
  - Provide an eastbound right-turn lane with a minimum storage length of 150 feet plus transition.
  - At this location, Whitmore Avenue's right of way width is approximately 61 feet. Impacts to ADC lands with the implementation of the recommendations above is expected to be minimal.

The recommended improvements will need to be reviewed and approved by DOT based on their jurisdiction of Whitmore Avenue.

7.0 SITE ACCESS, ON-SITE CIRCULATION AND PARKING

7.1 SITE ACCESS

Access to the site will be provided from Whitmore Avenue with project driveways proposed at Uakaniko'o Street, Lalawai Street intersection, and Ihiihi Avenue. As proposed, the intersections will be stop-controlled and all turning movements will be permitted without turning restrictions. Truck and employee access to the site will be provided off of Whitmore Avenue approximately 620 feet west of Uakaniko'o Street (Driveway 1). Section 6.3 suggests intersection improvements to serve Driveway 1 and improve access to the project site. These improvements include providing a separate eastbound right-turn lane and a westbound refuge lane for northbound left-turning vehicles. These improvements are recommended to reduce potential delays to passenger vehicles by trucks utilizing Driveway 1.

7.2 ON-SITE VEHICLE CIRCULATION

All vehicle trips will arrive to the site via Whitmore Avenue. The proposed project includes an internal roadway that will connect all driveways to accommodate on-site circulation. Each driveway is envisioned to serve specific land uses, as described below.

- **Driveway 1 (between Saipan and Uakaniko'o Street)** will provide access for trips related to the food hub, warehouse, and logistics yard, which includes truck and employee trips. This driveway dead ends at the southwestern corner of the site. Ample space for trucks to turn around and exit the site will be provided.
- **Driveway 2 (Whitmore Avenue/Uakaniko'o Street)** will provide direct access to parking for the Farmers Market and Food Hub Visitor Center. This driveway also provides access to the machine shop, food producer, and workforce housing.
- **Driveway 3 (Whitmore Avenue/Ihiihi Avenue)** will provide direct access to the food processing area, workforce housing, and the Research and Innovation Node (office).
- **Driveway 4 (Whitmore Avenue/Lalawai Street)** will provide direct access to the Research and Innovation Node (office).

The on-site roadway will be designed to meet all fire access and turnaround requirements.

7.3 ON-SITE PEDESTRIAN AND BICYCLE CIRCULATION

The Whitmore Community Food Hub Complex is envisioned to encourage walking and biking within and around the project site for the variety of users to explore the different uses and public spaces. An internal network of pedestrian walkways are proposed to facilitate walking trips through and to the site. A multi-use pathway is proposed that provides access to the southern edge of the project site and along Whitmore Avenue to the Whitmore Community Park. An additional pedestrian connection is proposed from the project site to Kahi Kani Park, providing improved walkability in the community.

Based on the lack of bicycle facilities and connections on Kamehameha Highway, growth in bicycle trips is not anticipated to be substantial enough to install separated bicycle facilities on Whitmore Avenue or on-site. However, secure bike parking and supplemental amenities are encouraged to be provided on-site. This would include bike racks at several key locations to encourage the use of non-automobile travel, particularly for local neighborhood trips.

7.4 WAREHOUSE DELIVERIES CIRCULATION

As discussed in the *On-Site Vehicle Circulation* section (7.2), truck deliveries to the warehouse and logistics yard will be made along Driveway 1 on the western edge of the project site.

Average daily traffic volumes were conducted on Whitmore Avenue in October 2018 for 24 hours. The highest peak travel period occurred during the AM peak hour (7:00 AM to 8:00 AM) and during a portion of the PM peak hour, from 3:00 PM to 4:00 PM. Traffic on Whitmore Avenue is generally lower in the early morning (4:00 AM to 5:00 AM), late morning (9:00 AM to 1:00 PM) and later evening (8:00 PM to Midnight). Where feasible, it is recommended that warehouse deliveries be scheduled during off-peak times to minimize delays on Whitmore Avenue.

7.5 PARKING

Parking will be provided on-site for all proposed uses in conformance with City and County of Honolulu parking requirements. A precise parking plan was not available at the time this report was prepared.

8.0 MULTI-MODAL ASSESSMENT

This chapter discusses the assessment of transit, bicycle, and pedestrian facilities with development of the proposed project. The Whitmore Community Food Hub Complex is envisioned to serve a variety of users who arrive to the site through a mix of modes, including driving, walking, biking, and transit. The vision for the project includes placemaking elements and improved mobility in Wahiawa. The placemaking component includes integrating public spaces throughout the project site intended for residents, employees, and visitors to traverse the development by walking or biking. Additionally, a pedestrian bridge from the project site, over the Kaukanahua stream to Wahiawa Town is being proposed by others. This pedestrian connection will facilitate multi-modal trips between Whitmore Village, the Whitmore Community Food Hub Complex, and Wahiawa.

The project site is located in central Oahu with limited regional pedestrian and bicycle facilities or connections between Whitmore Village and surrounding communities, which include agricultural lands. While limited in regional multi-modal connections such as sidewalks and bike lanes, the proposed project includes multi-modal connections between adjacent communities as well as a network of interior pedestrian walkways and amenities to provide a vibrant and walkable community space for residents, employees, and visitors.

Where feasible, the project is encouraged to comply with County and State Complete Streets policies and include adherence to key Complete Streets principles, including safety, Context Sensitive Solutions, accessibility and mobility, use and comfort of all users, consistency of design guidelines and standards, energy efficiency, and health and green infrastructure. In addition, all access driveways and crossing facilities shall be designed with maximum potential of pedestrian and bicycle safety measures.

8.1 TRANSIT FACILITIES

Existing transit operations is sufficient to serve the study area, which includes four service routes (52, 83, 88A, and 72) on Kamehameha Highway within walking distance from the project site. Route 72 provides direct access along Whitmore Avenue with 90-minute headways on weekdays and 75-minute headways on weekends. Modifications to transit stop locations are not recommended as a result of the development of the Whitmore Community Food Hub. The demand for local transit is anticipated to increase with development of the project site, which may require increased service to be provided in the future. It is recommended that transit stops are improved with amenities such as service information, benches, shelters, trash cans, and lighting at transit stops along the project frontage to encourage and promote transit use as an alternative to vehicle trips.

8.2 BICYCLE FACILITIES

Bike Plan Hawaii (2003), a State master plan for bikeways, is intended to serve as one basis for future bikeway planning and development decisions in Central Oahu. In addition, the Oahu Bike Plan (2012) provides guidance on desired bike facilities across the island of Oahu.

Within the project study area, Bike Plan Hawaii indicates implementation of the proposed project is not expected to conflict with any existing or planned bicycle facilities. The Oahu Bike Plan designates Whitmore Avenue as an existing bike route. No additional bicycle facilities are planned in the study area.

Bicyclists will be able to access the site via the new site driveways and multi-use path. The new multi-use path is proposed along the project frontage on the south side of Whitmore Avenue that would be available for use by bicycles and pedestrians. The proposed multi-use path will serve as an adequate bicycle facility to serve the project. On-site bike racks, secure bike storage, and secure moped parking shall be provided for residents, employees, and visitors.

8.3 PEDESTRIAN FACILITIES

A new multi-use path is proposed along the entire length of the project frontage on the south side of Whitmore Avenue. This path will provide visitors and local residents with a separate facility to walk along the side of Whitmore Avenue that currently does not have a sidewalk and will connect to the existing network of sidewalks around the study area. In keeping with the semi-rural nature of Whitmore Village, a separated all-weather path is recommended to designate a visible pedestrian zone and reduce the potential for pedestrian crossings between intersections. A landscaped buffer is recommended between the multi-use path and travel lanes to provide a physical and visual barrier between vehicles and non-motorists.

The existing striped crosswalks along Whitmore Avenue will provide sufficient connections between the north and south sides of the street. Measures to maximize visibility of pedestrians along and crossing Whitmore Avenue are recommended. High visibility crosswalks should be provided across all project driveways. Additional pedestrian amenities such as wayfinding signage, shade, LED lighting, and enhanced visibility are recommended to promote walking to and within the project site. Advanced stop/yield lines are recommended at all stop-controlled approaches to enhance pedestrian safety.

APPENDIX A: TRAFFIC COUNT DATA



Type of peak hour being reported: Intersection Peak

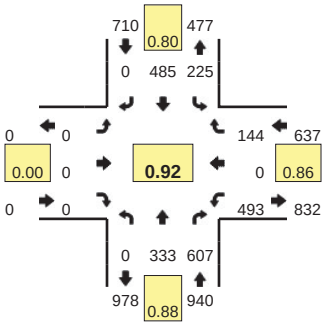
Method for determining peak hour: Total Entering Volume

LOCATION: Kamehameha Hwy -- Whitmore Ave

QC JOB #: 14824601

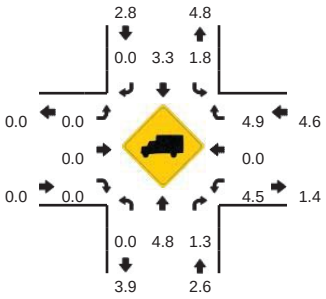
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DATE: Tue, Oct 23 2018

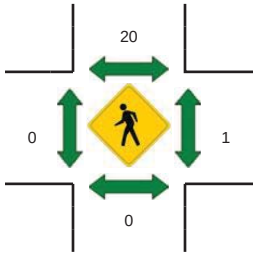


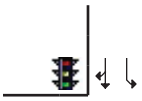
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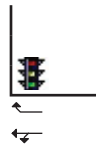
Peak 15-Min: 7:30 AM -- 7:45 AM

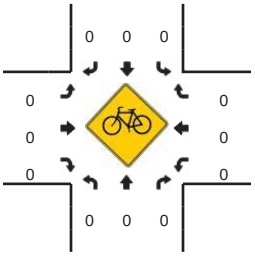


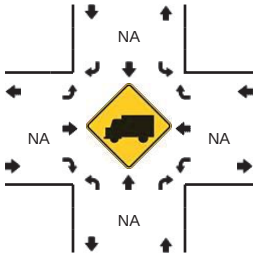


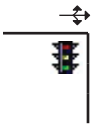


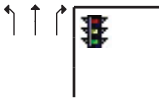


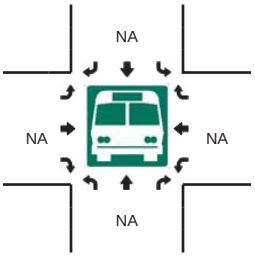












15-Min Count Period Beginning At	Kamehameha Hwy (Northbound)				Kamehameha Hwy (Southbound)				Whitmore Ave (Eastbound)				Whitmore Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	78	84	0	25	73	0	0	0	0	0	0	126	0	21	0	407	
6:15 AM	0	64	100	0	24	69	0	0	0	0	0	0	86	0	14	0	357	
6:30 AM	0	75	149	0	28	72	0	0	0	0	0	0	82	0	33	0	439	
6:45 AM	0	65	146	0	48	101	0	0	0	0	0	0	92	0	26	0	478	1681
7:00 AM	0	80	133	0	40	107	0	0	0	0	0	0	109	0	34	0	503	1777
7:15 AM	0	89	178	0	61	125	0	0	0	0	0	0	113	0	22	0	588	2008
7:30 AM	0	74	153	0	77	144	0	0	0	0	0	0	123	0	50	0	621	2190
7:45 AM	0	90	143	0	47	109	0	0	0	0	0	0	148	0	38	0	575	2287
8:00 AM	0	96	120	0	31	114	0	0	0	0	0	0	93	0	17	0	471	2255
8:15 AM	0	120	101	0	16	104	0	0	0	0	0	0	79	0	29	0	449	2116
8:30 AM	0	118	98	0	21	103	0	0	0	0	0	0	90	0	22	0	452	1947
8:45 AM	0	98	69	0	23	121	0	0	0	0	0	0	94	0	15	0	420	1792

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	296	612	0	308	576	0	0	0	0	0	0	492	0	200	0	2484
Heavy Trucks	0	16	4		0	32	0		0	0	0		36	0	4		92
Pedestrians		0				32				0				4			36
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/1/2018 3:57 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

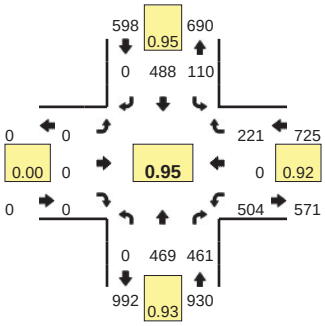
Method for determining peak hour: Total Entering Volume

LOCATION: Kamehameha Hwy -- Whitmore Ave

CITY/STATE: Whitmore Village, HI

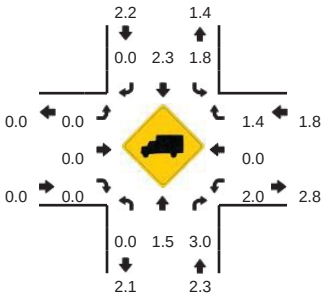
QC JOB #: 14824602

DATE: Tue, Oct 23 2018

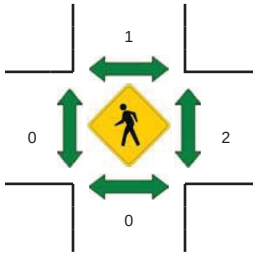


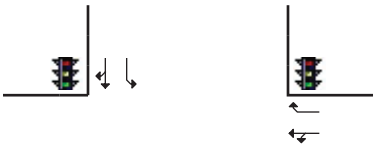
Peak-Hour: 3:45 PM -- 4:45 PM

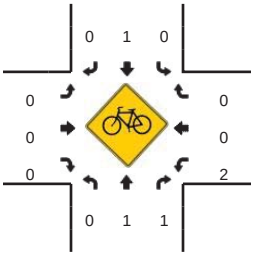
Peak 15-Min: 4:00 PM -- 4:15 PM

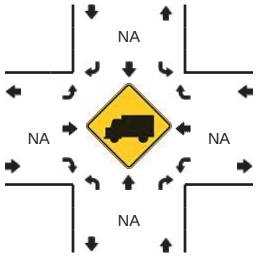


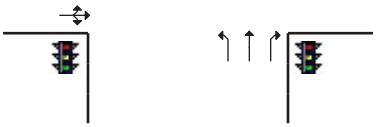


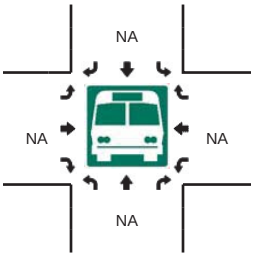












15-Min Count Period Beginning At	Kamehameha Hwy (Northbound)				Kamehameha Hwy (Southbound)				Whitmore Ave (Eastbound)				Whitmore Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:30 PM	0	135	97	0	31	109	0	0	0	0	0	0	107	0	52	0	531	
3:45 PM	0	113	104	0	29	133	0	0	0	0	0	0	92	0	85	0	556	
4:00 PM	0	133	123	0	31	119	0	0	0	0	0	0	131	0	53	0	590	
4:15 PM	0	108	124	0	32	113	0	0	0	0	0	0	151	0	46	0	574	2251
4:30 PM	0	115	110	0	18	123	0	0	0	0	0	0	130	0	37	0	533	2253
4:45 PM	0	148	96	0	20	112	0	0	0	0	0	0	102	0	27	0	505	2202
5:00 PM	0	96	124	0	26	129	0	0	0	0	0	0	124	0	38	0	537	2149
5:15 PM	0	146	109	0	9	109	0	0	0	0	0	0	131	0	21	0	525	2100
5:30 PM	0	108	101	0	21	147	0	0	0	0	0	0	108	0	21	0	506	2073
5:45 PM	0	87	108	0	19	151	0	0	0	0	0	0	91	0	20	0	476	2044
6:00 PM	0	99	111	0	19	140	0	0	0	0	0	0	98	0	17	0	484	1991
6:15 PM	0	93	99	0	17	133	0	0	0	0	0	0	93	0	8	0	443	1909

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	532	492	0	124	476	0	0	0	0	0	0	524	0	212	0	2360
Heavy Trucks	0	12	8		4	8	0		0	0	0		12	0	0		44
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		1	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/1/2018 3:57 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

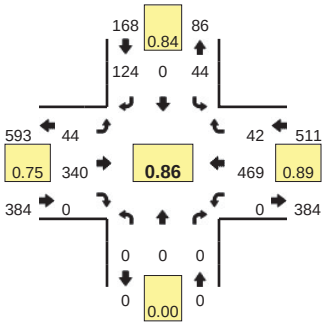
Method for determining peak hour: Total Entering Volume

LOCATION: Kulia St -- Whitmore Ave

CITY/STATE: Wahiawa, HI

QC JOB #: 14824608

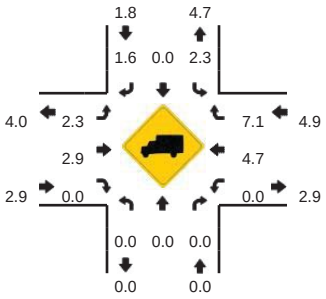
DATE: Tue, Oct 23 2018

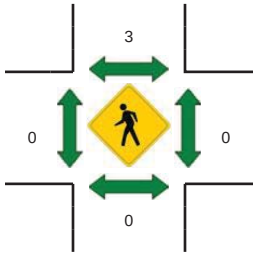


Peak-Hour: 7:00 AM -- 8:00 AM

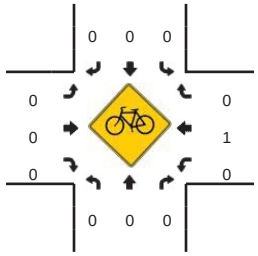
Peak 15-Min: 7:30 AM -- 7:45 AM

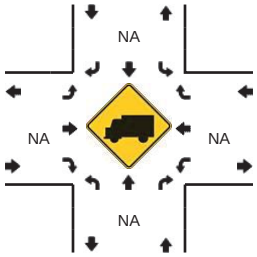




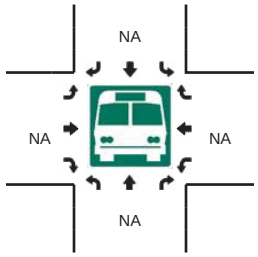












15-Min Count Period Beginning At	Kulia St (Northbound)				Kulia St (Southbound)				Whitmore Ave (Eastbound)				Whitmore Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	0	0	0	2	0	23	0	7	43	0	0	0	89	0	0	164	
6:15 AM	0	0	0	0	3	0	23	0	6	59	0	0	0	68	1	0	160	
6:30 AM	0	0	0	0	1	0	29	0	5	60	0	0	0	89	1	0	185	
6:45 AM	0	0	0	0	6	0	18	0	9	84	0	0	0	83	5	0	205	714
7:00 AM	0	0	0	0	13	0	37	0	8	64	0	0	0	92	11	0	225	775
7:15 AM	0	0	0	0	14	0	34	0	8	89	0	0	0	110	11	0	266	881
7:30 AM	0	0	0	0	11	0	23	0	16	116	0	0	0	134	10	0	310	1006
7:45 AM	0	0	0	0	6	0	30	0	12	71	0	0	0	133	10	0	262	1063
8:00 AM	0	0	0	0	2	0	15	0	16	62	0	0	0	61	1	0	157	995
8:15 AM	0	0	0	0	4	0	20	0	18	45	0	0	0	64	2	0	153	882
8:30 AM	0	0	0	0	4	0	20	0	14	37	0	0	0	68	1	0	144	716
8:45 AM	0	0	0	0	2	0	18	0	6	36	0	0	0	62	3	0	127	581

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	44	0	92	0	64	464	0	0	0	536	40	0	1240
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	24	4		32
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/1/2018 3:57 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

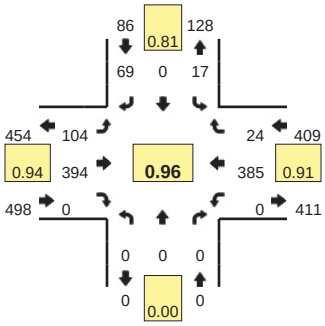
Method for determining peak hour: Total Entering Volume

LOCATION: Kulia St -- Whitmore Ave

CITY/STATE: Wahiawa, HI

QC JOB #: 14824609

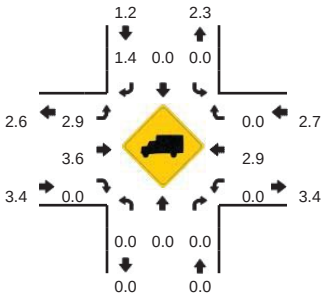
DATE: Tue, Oct 23 2018

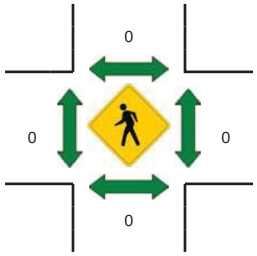


Peak-Hour: 3:30 PM -- 4:30 PM

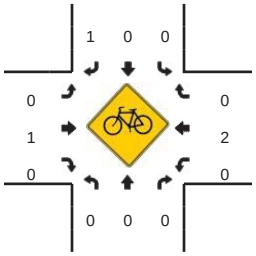
Peak 15-Min: 4:00 PM -- 4:15 PM

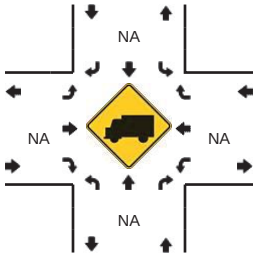




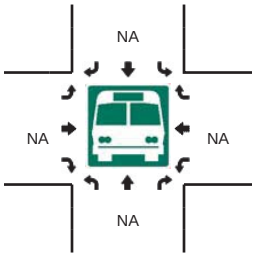












15-Min Count Period Beginning At	Kulia St (Northbound)				Kulia St (Southbound)				Whitmore Ave (Eastbound)				Whitmore Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:30 PM	0	0	0	0	5	0	20	0	22	98	0	0	0	104	8	0	257	
3:45 PM	0	0	0	0	4	0	13	0	17	100	0	0	0	98	6	0	238	
4:00 PM	0	0	0	0	4	0	16	0	23	110	0	0	0	99	7	0	259	
4:15 PM	0	0	0	0	4	0	20	0	42	86	0	0	0	84	3	0	239	993
4:30 PM	0	0	0	0	6	0	21	0	27	83	0	0	0	83	9	0	229	965
4:45 PM	0	0	0	0	6	0	20	0	21	86	0	0	0	68	7	0	208	935
5:00 PM	0	0	0	0	5	0	17	0	31	99	0	0	0	80	6	0	238	914
5:15 PM	0	0	0	0	5	0	16	0	37	73	0	0	0	64	4	0	199	874
5:30 PM	0	0	0	0	3	0	21	0	25	82	0	0	0	65	3	0	199	844
5:45 PM	0	0	0	0	6	0	21	0	17	90	0	0	0	69	7	0	210	846
6:00 PM	0	0	0	0	3	0	15	0	33	82	0	0	0	64	1	0	198	806
6:15 PM	0	0	0	0	4	0	27	0	18	75	0	0	0	39	4	0	167	774

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	16	0	64	0	92	440	0	0	0	396	28	0	1036
Heavy Trucks	0	0	0		0	0	0		0	16	0		0	4	0		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	1		0	1	0		0	2	0		4
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/1/2018 3:57 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

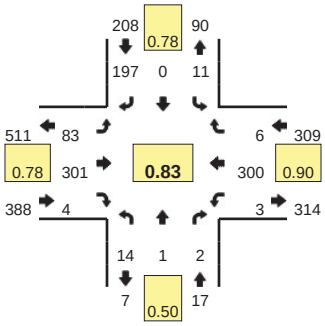
Type of peak hour being reported: Intersection Peak

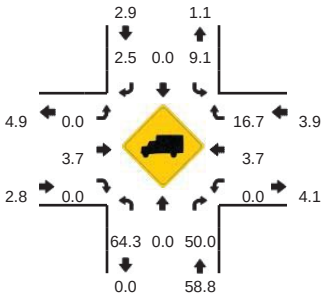
Method for determining peak hour: Total Entering Volume

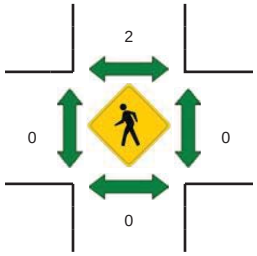
LOCATION: Ihiihi Ave -- Whitmore Ave
CITY/STATE: Wahiawa, HI

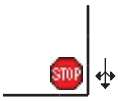
QC JOB #: 14824603
DATE: Tue, Oct 23 2018

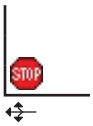
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

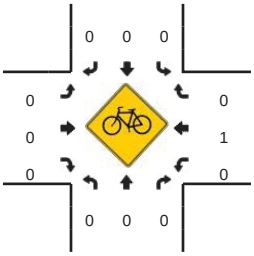


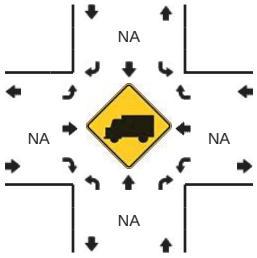


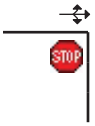


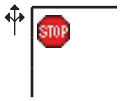


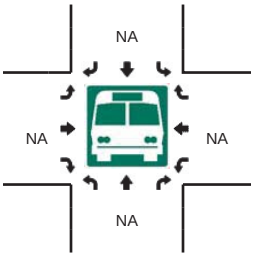












15-Min Count Period Beginning At	Ihiihi Ave (Northbound)				Ihiihi Ave (Southbound)				Whitmore Ave (Eastbound)				Whitmore Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	0	0	0	0	0	20	1	3	32	6	0	0	71	0	0	133	
6:15 AM	0	0	0	0	0	0	20	0	9	43	12	0	3	48	1	0	136	
6:30 AM	3	0	3	0	0	0	21	0	9	44	5	0	0	66	1	0	152	
6:45 AM	2	0	1	0	3	0	23	0	14	77	0	0	1	64	0	0	185	606
7:00 AM	8	1	1	0	1	0	30	0	12	69	1	0	0	65	1	0	189	662
7:15 AM	0	0	1	0	1	0	49	0	19	74	2	0	1	70	2	0	219	745
7:30 AM	6	0	0	0	5	0	55	0	33	93	1	0	0	84	2	0	279	872
7:45 AM	0	0	0	0	4	0	63	0	19	65	0	0	2	81	1	0	235	922
8:00 AM	1	0	0	0	0	0	13	0	11	51	2	0	0	45	0	0	123	856
8:15 AM	1	0	0	0	5	0	18	0	12	36	1	0	0	47	0	0	120	757
8:30 AM	0	0	0	0	1	0	12	0	10	30	1	0	0	60	1	0	115	593
8:45 AM	1	0	0	0	0	0	11	0	10	29	1	0	0	52	1	0	105	463

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	24	0	0	0	20	0	220	0	132	372	4	0	0	336	8	0	1116
Heavy Trucks	8	0	0		0	0	12		0	4	0		0	8	0		32
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/1/2018 3:57 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Ihiihi Ave -- Whitmore Ave

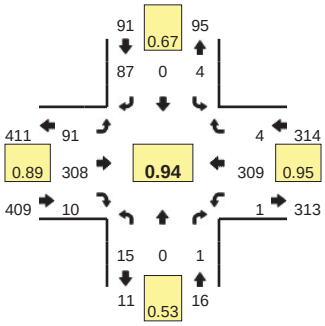
CITY/STATE: Wahiawa, HI

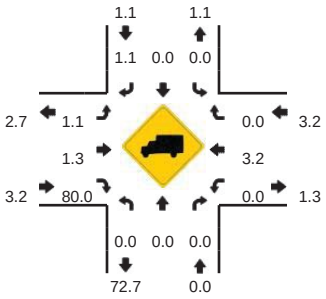
QC JOB #: 14824604

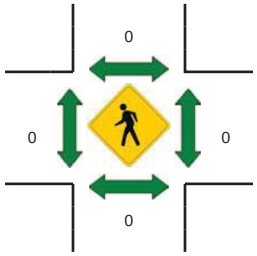
DATE: Tue, Oct 23 2018

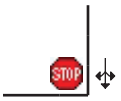
Peak-Hour: 3:30 PM -- 4:30 PM

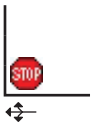
Peak 15-Min: 4:00 PM -- 4:15 PM

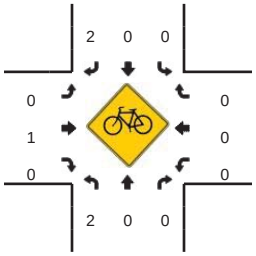


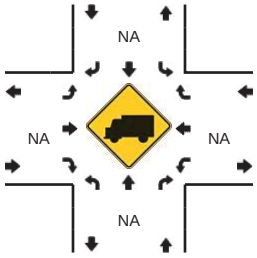


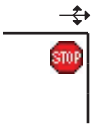


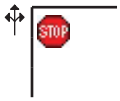


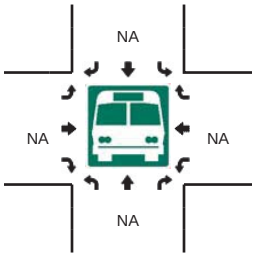












15-Min Count Period Beginning At	Ihiihi Ave (Northbound)				Ihiihi Ave (Southbound)				Whitmore Ave (Eastbound)				Whitmore Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:30 PM	1	0	0	0	2	0	32	0	23	76	3	0	0	82	1	0	220	
3:45 PM	2	0	0	0	1	0	19	0	22	77	5	0	0	81	2	0	209	
4:00 PM	8	0	0	0	0	0	15	0	22	91	2	0	0	83	0	0	221	
4:15 PM	4	0	1	0	1	0	21	0	24	64	0	0	1	63	1	0	180	830
4:30 PM	1	0	0	0	1	0	16	0	19	72	1	0	0	71	0	0	181	791
4:45 PM	3	0	0	0	2	0	24	0	14	72	2	0	0	51	1	0	169	751
5:00 PM	0	1	0	0	1	0	21	0	27	73	0	0	0	63	0	0	186	716
5:15 PM	3	0	0	0	0	0	12	0	13	68	0	0	0	51	0	0	147	683
5:30 PM	1	0	0	0	0	0	12	0	10	74	0	0	1	55	1	0	154	656
5:45 PM	1	0	0	0	1	0	13	0	11	91	0	0	0	64	1	0	182	669
6:00 PM	0	0	0	0	0	0	8	0	13	70	0	0	0	51	0	0	142	625
6:15 PM	0	0	0	0	2	0	9	0	17	60	0	0	0	35	1	0	124	602

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	32	0	0	0	0	0	60	0	88	364	8	0	0	332	0	0	884
Heavy Trucks	0	0	0		0	0	0		0	0	8		0	4	0		12
Pedestrians		0				0				0				0			0
Bicycles	1	0	0		0	0	1		0	0	0		0	0	0		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/1/2018 3:57 PM

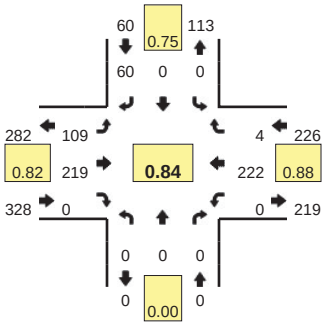
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

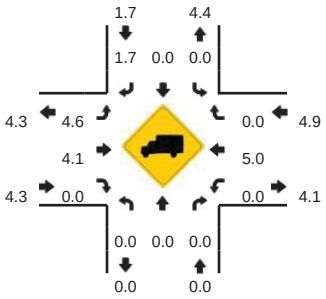
Method for determining peak hour: Total Entering Volume

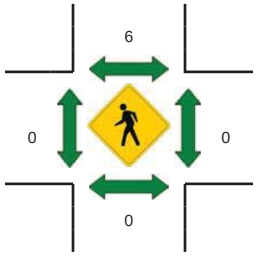
LOCATION: Lalawai St -- Whitmore Ave
CITY/STATE: Wahiawa, HI

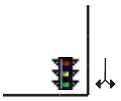
QC JOB #: 14824605
DATE: Tue, Oct 23 2018

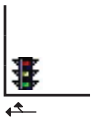


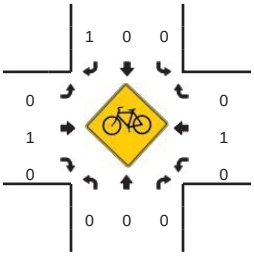
Peak-Hour: 6:45 AM -- 7:45 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

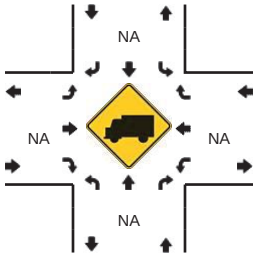


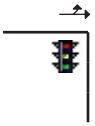




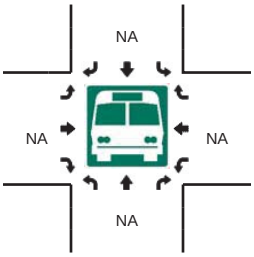












15-Min Count Period Beginning At	Lalawai St (Northbound)				Lalawai St (Southbound)				Whitmore Ave (Eastbound)				Whitmore Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	0	0	0	0	0	12	0	2	32	0	0	0	47	0	0	93	
6:15 AM	0	0	0	0	0	0	11	0	3	40	0	0	0	41	0	0	95	
6:30 AM	0	0	0	0	0	0	9	0	4	46	0	0	0	59	1	0	119	
6:45 AM	0	0	0	0	0	0	12	0	19	64	0	0	0	55	1	0	151	458
7:00 AM	0	0	0	0	0	0	19	0	14	52	0	0	0	45	3	0	133	498
7:15 AM	0	0	0	0	0	0	12	0	32	47	0	0	0	56	0	0	147	550
7:30 AM	0	0	0	0	0	0	17	0	44	56	0	0	0	66	0	0	183	614
7:45 AM	0	0	0	0	1	0	23	0	15	46	0	0	0	61	1	0	147	610
8:00 AM	0	0	0	0	0	0	6	0	5	45	0	0	0	37	0	0	93	570
8:15 AM	0	0	0	0	0	0	11	0	9	33	0	0	0	32	0	0	85	508
8:30 AM	0	0	0	0	0	0	5	0	4	25	0	0	0	53	1	0	88	413
8:45 AM	0	0	0	0	0	0	9	0	2	26	0	0	0	45	0	0	82	348

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	0	68	0	176	224	0	0	0	264	0	0	732
Heavy Trucks	0	0	0		0	0	0		4	0	0		0	8	0		12
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	1		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/1/2018 3:57 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

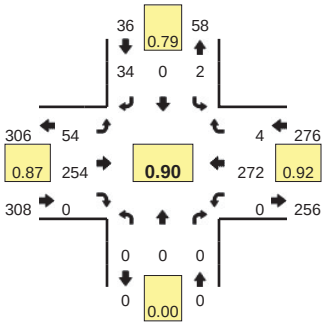
Type of peak hour being reported: Intersection Peak

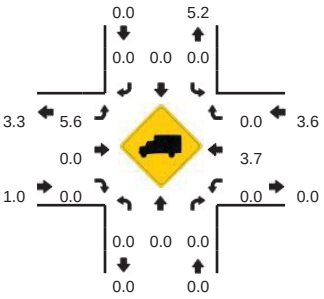
Method for determining peak hour: Total Entering Volume

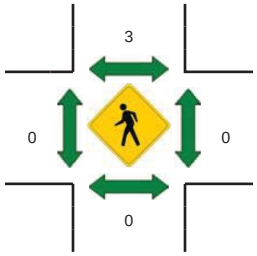
LOCATION: Lalawai St -- Whitmore Ave
CITY/STATE: Wahiawa, HI

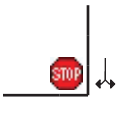
QC JOB #: 14824606
DATE: Tue, Oct 23 2018

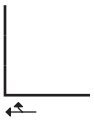
Peak-Hour: 3:30 PM -- 4:30 PM
Peak 15-Min: 4:00 PM -- 4:15 PM

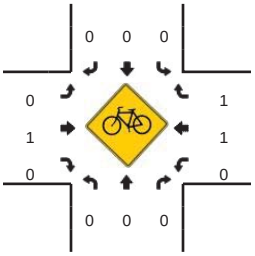


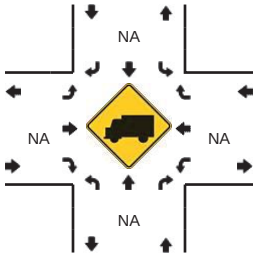


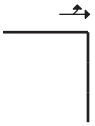




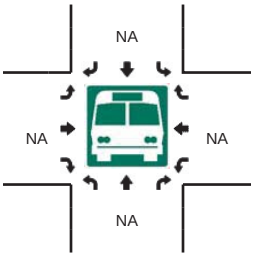












15-Min Count Period Beginning At	Lalawai St (Northbound)				Lalawai St (Southbound)				Whitmore Ave (Eastbound)				Whitmore Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:30 PM	0	0	0	0	0	0	6	0	14	61	0	0	0	73	2	0	156	
3:45 PM	0	0	0	0	1	0	11	0	17	61	0	0	0	72	1	0	163	
4:00 PM	0	0	0	0	1	0	9	0	12	77	0	0	0	72	1	0	172	
4:15 PM	0	0	0	0	0	0	8	0	11	55	0	0	0	55	0	0	129	620
4:30 PM	0	0	0	0	0	0	7	0	13	57	0	0	0	64	1	0	142	606
4:45 PM	0	0	0	0	0	0	8	0	16	60	0	1	0	42	2	0	129	572
5:00 PM	0	0	0	0	3	0	11	0	7	64	0	0	0	53	1	0	139	539
5:15 PM	0	0	0	0	0	0	5	0	8	64	0	0	0	45	0	0	122	532
5:30 PM	0	0	0	0	1	0	13	0	16	55	0	0	0	46	2	0	133	523
5:45 PM	0	0	0	0	1	0	10	0	9	80	0	0	0	55	0	0	155	549
6:00 PM	0	0	0	0	0	0	7	0	9	62	0	0	0	42	3	0	123	533
6:15 PM	0	0	0	0	1	0	8	0	15	48	0	0	0	28	0	0	100	511

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	4	0	36	0	48	308	0	0	0	288	4	0	688
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	4	0		4
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	1		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/2/2018 11:44 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

LOCATION: Whitmore Ave btwn Saipan Dr and Uakaniko'o St
QC JOB #: 14824607
SPECIFIC LOCATION: Whitmore Ave btwn Saipan Dr and Uakaniko'o St
DIRECTION: EB/WB
CITY/STATE: Wahiawa, HI
DATE: Oct 23 2018 - Oct 23 2018

Start Time	Mon	Tue 23-Oct-18	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM		28				28			28	
12:15 AM		24				24			24	
12:30 AM		24				24			24	
12:45 AM		9				9			9	
1:00 AM		8				8			8	
1:15 AM		23				23			23	
1:30 AM		13				13			13	
1:45 AM		11				11			11	
2:00 AM		12				12			12	
2:15 AM		5				5			5	
2:30 AM		14				14			14	
2:45 AM		12				12			12	
3:00 AM		9				9			9	
3:15 AM		9				9			9	
3:30 AM		17				17			17	
3:45 AM		27				27			27	
4:00 AM		32				32			32	
4:15 AM		31				31			31	
4:30 AM		64				64			64	
4:45 AM		83				83			83	
5:00 AM		81				81			81	
5:15 AM		102				102			102	
5:30 AM		133				133			133	
5:45 AM		140				140			140	
Day Total										
% Weekday Average										
% Week Average										
AM Peak Volume										
PM Peak Volume										

Comments:

Quality Counts
TRANSPORTATION DATA COLLECTION

LOCATION: Whitmore Ave btwn Saipan Dr and Uakaniko'o St
QC JOB #: 14824607
SPECIFIC LOCATION: Whitmore Ave btwn Saipan Dr and Uakaniko'o St
DIRECTION: EB/WB
CITY/STATE: Wahiawa, HI
DATE: Oct 23 2018 - Oct 23 2018

Start Time	Mon	Tue 23-Oct-18	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
6:00 AM		181				181			181	
6:15 AM		163				163			163	
6:30 AM		173				173			173	
6:45 AM		203				203			203	
7:00 AM		206				206			206	
7:15 AM		209				209			209	
7:30 AM		**294**				**294**			**294**	
7:45 AM		226				226			226	
8:00 AM		170				170			170	
8:15 AM		163				163			163	
8:30 AM		144				144			144	
8:45 AM		142				142			142	
9:00 AM		117				117			117	
9:15 AM		128				128			128	
9:30 AM		137				137			137	
9:45 AM		112				112			112	
10:00 AM		112				112			112	
10:15 AM		100				100			100	
10:30 AM		120				120			120	
10:45 AM		109				109			109	
11:00 AM		120				120			120	
11:15 AM		108				108			108	
11:30 AM		127				127			127	
11:45 AM		136				136			136	
Day Total										
% Weekday Average										
% Week Average										
AM Peak Volume										
PM Peak Volume										

Comments:

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

LOCATION: Whitmore Ave btwn Saipan Dr and Uakaniko'o St
QC JOB #: 14824607
SPECIFIC LOCATION: Whitmore Ave btwn Saipan Dr and Uakaniko'o St
DIRECTION: EB/WB
CITY/STATE: Wahiawa, HI
DATE: Oct 23 2018 - Oct 23 2018

Start Time	Mon	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
		23-Oct-18								
12:00 PM		106				106			106	
12:15 PM		113				113			113	
12:30 PM		110				110			110	
12:45 PM		119				119			119	
1:00 PM		135				135			135	
1:15 PM		141				141			141	
1:30 PM		162				162			162	
1:45 PM		103				103			103	
2:00 PM		155				155			155	
2:15 PM		230				230			230	
2:30 PM		181				181			181	
2:45 PM		174				174			174	
3:00 PM		234				234			234	
3:15 PM		209				209			209	
3:30 PM		244				244			244	
3:45 PM		226				226			226	
4:00 PM		227				227			227	
4:15 PM		**251**				**251**			**251**	
4:30 PM		215				215			215	
4:45 PM		206				206			206	
5:00 PM		221				221			221	
5:15 PM		234				234			234	
5:30 PM		197				197			197	
5:45 PM		212				212			212	
Day Total										
% Weekday Average										
% Week Average										
AM Peak Volume										
PM Peak Volume										

Comments:

Quality Counts
TRANSPORTATION DATA COLLECTION

LOCATION: Whitmore Ave btwn Saipan Dr and Uakaniko'o St
QC JOB #: 14824607
SPECIFIC LOCATION: Whitmore Ave btwn Saipan Dr and Uakaniko'o St
DIRECTION: EB/WB
CITY/STATE: Wahiawa, HI
DATE: Oct 23 2018 - Oct 23 2018

Start Time	Mon	Tue 23-Oct-18	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
6:00 PM		207				207			207	
6:15 PM		172				172			172	
6:30 PM		166				166			166	
6:45 PM		149				149			149	
7:00 PM		124				124			124	
7:15 PM		158				158			158	
7:30 PM		113				113			113	
7:45 PM		107				107			107	
8:00 PM		144				144			144	
8:15 PM		88				88			88	
8:30 PM		77				77			77	
8:45 PM		84				84			84	
9:00 PM		66				66			66	
9:15 PM		77				77			77	
9:30 PM		69				69			69	
9:45 PM		74				74			74	
10:00 PM		50				50			50	
10:15 PM		50				50			50	
10:30 PM		44				44			44	
10:45 PM		38				38			38	
11:00 PM		30				30			30	
11:15 PM		32				32			32	
11:30 PM		30				30			30	
11:45 PM		24				24			24	
Day Total		11189				11189			11189	
% Weekday Average		100.0%								
% Week Average		100.0%				100.0%				
AM Peak		7:30 AM				7:30 AM			7:30 AM	
Volume		294				294			294	
PM Peak		4:15 PM				4:15 PM			4:15 PM	
Volume		251				251			251	

Comments:

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

APPENDIX B: HCM LOS WORKSHEETS (EXISTING CONDITIONS, BASELINE (2028) WITHOUT PROJECT CONDITIONS, BASELINE (2028) WITH PROJECT CONDITIONS





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	493	0	144	0	333	607	225	485	0
Future Volume (veh/h)	0	0	0	493	0	144	0	333	607	225	485	0
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	1870	1870	1870	1870	1870	1841	1870	1841	1870	1870	1856	1856
Adj Flow Rate, veh/h	0	0	0	536	0	0	0	362	0	245	527	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	4	2	4	2	2	3	3
Cap, veh/h	0	797	0	696	0		2	439		292	852	0
Arrive On Green	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.24	0.00	0.16	0.46	0.00
Sat Flow, veh/h	0	1870	0	1418	0	1560	1781	1841	1585	1781	1856	0
Grp Volume(v), veh/h	0	0	0	536	0	0	0	362	0	245	527	0
Grp Sat Flow(s),veh/h/ln	0	1870	0	1418	0	1560	1781	1841	1585	1781	1856	0
Q Serve(g_s), s	0.0	0.0	0.0	27.5	0.0	0.0	0.0	14.7	0.0	10.5	16.9	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	27.5	0.0	0.0	0.0	14.7	0.0	10.5	16.9	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	797	0	696	0		2	439		292	852	0
V/C Ratio(X)	0.00	0.00	0.00	0.77	0.00		0.00	0.83		0.84	0.62	0.00
Avail Cap(c_a), veh/h	0	1437	0	1181	0		124	1134		509	1779	0
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)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	20.8	0.0	0.0	0.0	28.4	0.0	31.9	16.1	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.8	0.0	0.0	0.0	4.0	0.0	6.4	0.7	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	0.0	0.0	0.0	8.9	0.0	0.0	0.0	6.4	0.0	4.7	6.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	22.7	0.0	0.0	0.0	32.4	0.0	38.3	16.8	0.0
LnGrp LOS	A	A	A	C	A		A	C		D	B	A
Approach Vol, veh/h		0			536	A		362	A		772	
Approach Delay, s/veh		0.0			22.7			32.4			23.6	
Approach LOS					C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.4	23.3		38.1	0.0	40.7		38.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	22.5	48.5		60.5	5.5	75.5		60.5				
Max Q Clear Time (g_c+I1), s	12.5	16.7		0.0	0.0	18.9		29.5				
Green Ext Time (p_c), s	0.5	2.0		0.0	0.0	3.4		4.1				

Intersection Summary		
HCM 6th Ctrl Delay		25.2
HCM 6th LOS		C

Notes

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

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	470	362	603	10	10	34
Future Vol, veh/h	470	362	603	10	10	34
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	440	-	-	280	270	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	511	393	655	11	11	37

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	669	0	-	0	2082	339
Stage 1	-	-	-	-	664	-
Stage 2	-	-	-	-	1418	-
Critical Hdwy	4.13	-	-	-	6.63	6.93
Critical Hdwy Stg 1	-	-	-	-	5.83	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	919	-	-	-	52	658
Stage 1	-	-	-	-	474	-
Stage 2	-	-	-	-	223	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	916	-	-	-	23	654
Mov Cap-2 Maneuver	-	-	-	-	143	-
Stage 1	-	-	-	-	209	-
Stage 2	-	-	-	-	222	-

Approach	EB	WB	SB
HCM Control Delay, s	7.8	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	916	-	-	-	143	654
HCM Lane V/C Ratio	0.558	-	-	-	0.076	0.057
HCM Control Delay (s)	13.8	-	-	-	32.2	10.8
HCM Lane LOS	B	-	-	-	D	B
HCM 95th %tile Q(veh)	3.5	-	-	-	0.2	0.2

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	367	573	20	17	40
Future Vol, veh/h	5	367	573	20	17	40
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	399	623	22	18	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	648	0	-	0	1049	640
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	412	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	938	-	-	-	252	475
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	669	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	935	-	-	-	249	472
Mov Cap-2 Maneuver	-	-	-	-	249	-
Stage 1	-	-	-	-	522	-
Stage 2	-	-	-	-	667	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	935	-	-	-	373
HCM Lane V/C Ratio	0.006	-	-	-	0.166
HCM Control Delay (s)	8.9	0	-	-	16.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.6

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	44	340	469	42	44	124
Future Vol, veh/h	44	340	469	42	44	124
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	4	7	2	2
Mvmt Flow	51	395	545	49	51	144

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	597	0	-	0	1073	576
Stage 1	-	-	-	-	573	-
Stage 2	-	-	-	-	500	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	980	-	-	-	244	517
Stage 1	-	-	-	-	564	-
Stage 2	-	-	-	-	609	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	977	-	-	-	226	514
Mov Cap-2 Maneuver	-	-	-	-	226	-
Stage 1	-	-	-	-	525	-
Stage 2	-	-	-	-	607	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	23.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	977	-	-	-	385
HCM Lane V/C Ratio	0.052	-	-	-	0.507
HCM Control Delay (s)	8.9	0	-	-	23.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.8

Intersection	
Intersection Delay, s/veh	16.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	83	301	4	3	300	6	14	1	2	11	0	197
Future Vol, veh/h	83	301	4	3	300	6	14	1	2	11	0	197
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	2	3	2	2	3	16	64	2	50	9	2	2
Mvmt Flow	100	363	5	4	361	7	17	1	2	13	0	237
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	19.9	15.4	11.4	12.5
HCM LOS	C	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	82%	21%	1%	5%
Vol Thru, %	6%	78%	97%	0%
Vol Right, %	12%	1%	2%	95%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	388	309	208
LT Vol	14	83	3	11
Through Vol	1	301	300	0
RT Vol	2	4	6	197
Lane Flow Rate	20	467	372	251
Geometry Grp	1	1	1	1
Degree of Util (X)	0.045	0.696	0.564	0.397
Departure Headway (Hd)	7.913	5.362	5.45	5.701
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	450	673	659	629
Service Time	6.01	3.414	3.504	3.764
HCM Lane V/C Ratio	0.044	0.694	0.564	0.399
HCM Control Delay	11.4	19.9	15.4	12.5
HCM Lane LOS	B	C	C	B
HCM 95th-tile Q	0.1	5.6	3.5	1.9

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	109	219	222	4	0	60
Future Vol, veh/h	109	219	222	4	0	60
Conflicting Peds, #/hr	6	0	0	6	6	6
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	4	4	4	2	2	2
Mvmt Flow	130	261	264	5	0	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	275	0	-	0	800	279
Stage 1	-	-	-	-	273	-
Stage 2	-	-	-	-	527	-
Critical Hdwy	4.14	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.236	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1277	-	-	-	354	760
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	592	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1270	-	-	-	308	751
Mov Cap-2 Maneuver	-	-	-	-	308	-
Stage 1	-	-	-	-	676	-
Stage 2	-	-	-	-	588	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1270	-	-	-	751
HCM Lane V/C Ratio	0.102	-	-	-	0.095
HCM Control Delay (s)	8.2	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	504	0	221	0	469	461	110	488	0
Future Volume (veh/h)	0	0	0	504	0	221	0	469	461	110	488	0
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	531	0	0	0	494	0	116	514	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	784	0	691	0		2	587		151	859	0
Arrive On Green	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.31	0.00	0.08	0.46	0.00
Sat Flow, veh/h	0	1870	0	1418	0	1585	1781	1870	1585	1781	1870	0
Grp Volume(v), veh/h	0	0	0	531	0	0	0	494	0	116	514	0
Grp Sat Flow(s),veh/h/ln	0	1870	0	1418	0	1585	1781	1870	1585	1781	1870	0
Q Serve(g_s), s	0.0	0.0	0.0	25.5	0.0	0.0	0.0	18.3	0.0	4.7	15.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	25.5	0.0	0.0	0.0	18.3	0.0	4.7	15.2	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	784	0	701	0		2	587		151	859	0
V/C Ratio(X)	0.00	0.00	0.00	0.76	0.00		0.00	0.84		0.77	0.60	0.00
Avail Cap(c_a), veh/h	0	1197	0	1014	0		132	1399		444	1979	0
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)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	19.7	0.0	0.0	0.0	23.7	0.0	33.2	15.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.0	0.0	0.0	0.0	3.3	0.0	8.0	0.7	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	0.0	0.0	0.0	8.0	0.0	0.0	0.0	7.7	0.0	2.2	5.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	21.7	0.0	0.0	0.0	27.1	0.0	41.2	15.6	0.0
LnGrp LOS	A	A	A	C	A		A	C		D	B	A
Approach Vol, veh/h		0			531	A		494	A		630	
Approach Delay, s/veh		0.0			21.7			27.1			20.3	
Approach LOS					C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.8	27.8		35.6	0.0	38.6		35.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	18.5	55.5		47.5	5.5	78.5		47.5				
Max Q Clear Time (g_c+I1), s	6.7	20.3		0.0	0.0	17.2		27.5				
Green Ext Time (p_c), s	0.2	3.0		0.0	0.0	3.3		3.6				

Intersection Summary			
HCM 6th Ctrl Delay		22.8	
HCM 6th LOS		C	

Notes

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

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	80	491	461	5	15	264
Future Vol, veh/h	80	491	461	5	15	264
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	440	-	-	280	270	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	534	501	5	16	287

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	509	0	-	0	1218	259
Stage 1	-	-	-	-	507	-
Stage 2	-	-	-	-	711	-
Critical Hdwy	4.13	-	-	-	6.63	6.93
Critical Hdwy Stg 1	-	-	-	-	5.83	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	1054	-	-	-	186	741
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	486	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1051	-	-	-	170	737
Mov Cap-2 Maneuver	-	-	-	-	371	-
Stage 1	-	-	-	-	522	-
Stage 2	-	-	-	-	485	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1051	-	-	-	371	737
HCM Lane V/C Ratio	0.083	-	-	-	0.044	0.389
HCM Control Delay (s)	8.7	-	-	-	15.1	13
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.1	1.9

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	488	442	12	10	24
Future Vol, veh/h	18	488	442	12	10	24
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	530	480	13	11	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	496	0	-	0	1063	493
Stage 1	-	-	-	-	490	-
Stage 2	-	-	-	-	573	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1068	-	-	-	247	576
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	564	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1065	-	-	-	239	573
Mov Cap-2 Maneuver	-	-	-	-	239	-
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	562	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	14.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1065	-	-	-	406
HCM Lane V/C Ratio	0.018	-	-	-	0.091
HCM Control Delay (s)	8.4	0	-	-	14.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	104	394	385	24	17	69
Future Vol, veh/h	104	394	385	24	17	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	3	2	2	2	2
Mvmt Flow	108	410	401	25	18	72

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	426	0	-	0	1040	414
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	626	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1133	-	-	-	255	638
Stage 1	-	-	-	-	667	-
Stage 2	-	-	-	-	533	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	1133	-	-	-	224	638
Mov Cap-2 Maneuver	-	-	-	-	224	-
Stage 1	-	-	-	-	585	-
Stage 2	-	-	-	-	533	-

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	14.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1133	-	-	-	467
HCM Lane V/C Ratio	0.096	-	-	-	0.192
HCM Control Delay (s)	8.5	0	-	-	14.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.7

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	91	308	10	1	309	4	15	0	1	4	0	87
Future Vol, veh/h	91	308	10	1	309	4	15	0	1	4	0	87
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
Heavy Vehicles, %	2	2	80	2	3	2	2	2	2	2	2	2
Mvmt Flow	97	328	11	1	329	4	16	0	1	4	0	93
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	13.5	11.4	9.3	9
HCM LOS	B	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	94%	22%	0%	4%
Vol Thru, %	0%	75%	98%	0%
Vol Right, %	6%	2%	1%	96%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	16	409	314	91
LT Vol	15	91	1	4
Through Vol	0	308	309	0
RT Vol	1	10	4	87
Lane Flow Rate	17	435	334	97
Geometry Grp	1	1	1	1
Degree of Util (X)	0.029	0.56	0.436	0.137
Departure Headway (Hd)	6.077	4.631	4.702	5.104
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	593	774	762	695
Service Time	4.077	2.683	2.759	3.187
HCM Lane V/C Ratio	0.029	0.562	0.438	0.14
HCM Control Delay	9.3	13.5	11.4	9
HCM Lane LOS	A	B	B	A
HCM 95th-tile Q	0.1	3.5	2.2	0.5

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	54	254	272	4	2	34
Future Vol, veh/h	54	254	272	4	2	34
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	2	3	2	2	2
Mvmt Flow	60	282	302	4	2	38

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	309	0	-	0	712	310
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	405	-
Critical Hdwy	4.15	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.245	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1235	-	-	-	399	730
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	673	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1231	-	-	-	373	726
Mov Cap-2 Maneuver	-	-	-	-	373	-
Stage 1	-	-	-	-	700	-
Stage 2	-	-	-	-	671	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1231	-	-	-	690
HCM Lane V/C Ratio	0.049	-	-	-	0.058
HCM Control Delay (s)	8.1	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	550	0	160	0	390	670	250	560	0
Future Volume (veh/h)	0	0	0	550	0	160	0	390	670	250	560	0
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	1870	1870	1870	1870	1870	1841	1870	1841	1870	1870	1856	1856
Adj Flow Rate, veh/h	0	0	0	579	0	0	0	411	0	263	589	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	4	2	4	2	2	3	3
Cap, veh/h	0	829	0	699	0		2	471		298	868	0
Arrive On Green	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.26	0.00	0.17	0.47	0.00
Sat Flow, veh/h	0	1870	0	1418	0	1560	1781	1841	1585	1781	1856	0
Grp Volume(v), veh/h	0	0	0	579	0	0	0	411	0	263	589	0
Grp Sat Flow(s),veh/h/ln	0	1870	0	1418	0	1560	1781	1841	1585	1781	1856	0
Q Serve(g_s), s	0.0	0.0	0.0	39.0	0.0	0.0	0.0	21.7	0.0	14.6	25.1	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	39.0	0.0	0.0	0.0	21.7	0.0	14.6	25.1	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	829	0	699	0		2	471		298	868	0
V/C Ratio(X)	0.00	0.00	0.00	0.83	0.00		0.00	0.87		0.88	0.68	0.00
Avail Cap(c_a), veh/h	0	1114	0	915	0		96	879		395	1380	0
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)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	26.6	0.0	0.0	0.0	36.2	0.0	41.3	21.1	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	4.9	0.0	0.0	0.0	5.1	0.0	16.4	0.9	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	0.0	0.0	0.0	13.7	0.0	0.0	0.0	9.9	0.0	7.5	10.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	31.5	0.0	0.0	0.0	41.3	0.0	57.7	22.0	0.0
LnGrp LOS	A	A	A	C	A		A	D		E	C	A
Approach Vol, veh/h		0			579	A		411	A		852	
Approach Delay, s/veh		0.0			31.5			41.3			33.0	
Approach LOS					C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.5	30.5		49.5	0.0	52.0		49.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	22.5	48.5		60.5	5.5	75.5		60.5				
Max Q Clear Time (g_c+I1), s	16.6	23.7		0.0	0.0	27.1		41.0				
Green Ext Time (p_c), s	0.4	2.3		0.0	0.0	3.9		4.0				

Intersection Summary			
HCM 6th Ctrl Delay		34.4	
HCM 6th LOS		C	

Notes

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

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	520	400	670	20	20	40
Future Vol, veh/h	520	400	670	20	20	40
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	440	-	-	280	270	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	547	421	705	21	21	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	729	0	-	0	2237	369
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	1518	-
Critical Hdwy	4.13	-	-	-	6.63	6.93
Critical Hdwy Stg 1	-	-	-	-	5.83	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	873	-	-	-	41	629
Stage 1	-	-	-	-	445	-
Stage 2	-	-	-	-	199	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	871	-	-	-	~ 15	625
Mov Cap-2 Maneuver	-	-	-	-	118	-
Stage 1	-	-	-	-	165	-
Stage 2	-	-	-	-	198	-

Approach	EB	WB	SB
HCM Control Delay, s	9	0	21.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	871	-	-	-	118	625
HCM Lane V/C Ratio	0.628	-	-	-	0.178	0.067
HCM Control Delay (s)	15.9	-	-	-	42	11.2
HCM Lane LOS	C	-	-	-	E	B
HCM 95th %tile Q(veh)	4.6	-	-	-	0.6	0.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	410	640	30	20	50
Future Vol, veh/h	10	410	640	30	20	50
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	432	674	32	21	53

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	709	0	-	0	1150	696
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	457	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	890	-	-	-	219	442
Stage 1	-	-	-	-	496	-
Stage 2	-	-	-	-	638	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	887	-	-	-	214	439
Mov Cap-2 Maneuver	-	-	-	-	214	-
Stage 1	-	-	-	-	487	-
Stage 2	-	-	-	-	636	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	18.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	887	-	-	-	338
HCM Lane V/C Ratio	0.012	-	-	-	0.218
HCM Control Delay (s)	9.1	0	-	-	18.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.8

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	380	520	50	50	140
Future Vol, veh/h	50	380	520	50	50	140
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	4	7	2	2
Mvmt Flow	53	400	547	53	53	147

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	603	0	-	0	1086	580
Stage 1	-	-	-	-	577	-
Stage 2	-	-	-	-	509	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	975	-	-	-	239	514
Stage 1	-	-	-	-	562	-
Stage 2	-	-	-	-	604	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	972	-	-	-	221	511
Mov Cap-2 Maneuver	-	-	-	-	221	-
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	602	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	24.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	972	-	-	-	380
HCM Lane V/C Ratio	0.054	-	-	-	0.526
HCM Control Delay (s)	8.9	0	-	-	24.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.9

Intersection	
Intersection Delay, s/veh	17.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	100	340	10	10	330	10	20	10	10	20	0	220
Future Vol, veh/h	100	340	10	10	330	10	20	10	10	20	0	220
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.69	0.95	0.95
Heavy Vehicles, %	2	3	2	2	3	16	64	2	50	9	2	2
Mvmt Flow	105	358	11	11	347	11	21	11	11	29	0	232
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	21.9	16.2	11.8	13.2
HCM LOS	C	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	22%	3%	8%
Vol Thru, %	25%	76%	94%	0%
Vol Right, %	25%	2%	3%	92%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	450	350	240
LT Vol	20	100	10	20
Through Vol	10	340	330	0
RT Vol	10	10	10	220
Lane Flow Rate	42	474	368	261
Geometry Grp	1	1	1	1
Degree of Util (X)	0.093	0.726	0.576	0.424
Departure Headway (Hd)	7.994	5.514	5.629	5.856
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	451	654	637	610
Service Time	5.994	3.584	3.705	3.942
HCM Lane V/C Ratio	0.093	0.725	0.578	0.428
HCM Control Delay	11.8	21.9	16.2	13.2
HCM Lane LOS	B	C	C	B
HCM 95th-tile Q	0.3	6.2	3.7	2.1

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	120	250	250	10	0	70
Future Vol, veh/h	120	250	250	10	0	70
Conflicting Peds, #/hr	6	0	0	6	6	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	2	2	2
Mvmt Flow	126	263	263	11	0	74

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	280	0	-	0	796	281
Stage 1	-	-	-	-	275	-
Stage 2	-	-	-	-	521	-
Critical Hdwy	4.14	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.236	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1271	-	-	-	356	758
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	596	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1264	-	-	-	310	749
Mov Cap-2 Maneuver	-	-	-	-	310	-
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	592	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1264	-	-	-	749
HCM Lane V/C Ratio	0.1	-	-	-	0.098
HCM Control Delay (s)	8.2	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	560	0	250	0	540	510	130	570	0
Future Volume (veh/h)	0	0	0	560	0	250	0	540	510	130	570	0
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	1870	1870	1870	1870	1870	1841	1870	1841	1870	1870	1856	1856
Adj Flow Rate, veh/h	0	0	0	589	0	0	0	568	0	137	600	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	4	2	4	2	2	3	3
Cap, veh/h	0	810	0	683	0		2	633		168	893	0
Arrive On Green	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.34	0.00	0.09	0.48	0.00
Sat Flow, veh/h	0	1870	0	1418	0	1560	1781	1841	1585	1781	1856	0
Grp Volume(v), veh/h	0	0	0	589	0	0	0	568	0	137	600	0
Grp Sat Flow(s),veh/h/ln	0	1870	0	1418	0	1560	1781	1841	1585	1781	1856	0
Q Serve(g_s), s	0.0	0.0	0.0	42.4	0.0	0.0	0.0	30.8	0.0	7.9	26.1	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	42.4	0.0	0.0	0.0	30.8	0.0	7.9	26.1	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	810	0	683	0		2	633		168	893	0
V/C Ratio(X)	0.00	0.00	0.00	0.86	0.00		0.00	0.90		0.81	0.67	0.00
Avail Cap(c_a), veh/h	0	844	0	708	0		93	971		313	1384	0
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)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	28.9	0.0	0.0	0.0	32.8	0.0	46.7	20.9	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	10.5	0.0	0.0	0.0	7.5	0.0	9.1	0.9	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	0.0	0.0	0.0	16.0	0.0	0.0	0.0	14.1	0.0	3.8	10.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	39.4	0.0	0.0	0.0	40.2	0.0	55.8	21.8	0.0
LnGrp LOS	A	A	A	D	A		A	D		E	C	A
Approach Vol, veh/h		0			589	A		568	A		737	
Approach Delay, s/veh		0.0			39.4			40.2			28.1	
Approach LOS					D			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.4	40.7		50.1	0.0	55.1		50.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	18.5	55.5		47.5	5.5	78.5		47.5				
Max Q Clear Time (g_c+I1), s	9.9	32.8		0.0	0.0	28.1		44.4				
Green Ext Time (p_c), s	0.2	3.4		0.0	0.0	4.0		1.2				

Intersection Summary		
HCM 6th Ctrl Delay		35.3
HCM 6th LOS		D

Notes

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

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	90	550	510	10	20	300
Future Vol, veh/h	90	550	510	10	20	300
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	440	-	-	280	270	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	95	579	537	11	21	316

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	551	0	-	0	1318	280
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	772	-
Critical Hdwy	4.13	-	-	-	6.63	6.93
Critical Hdwy Stg 1	-	-	-	-	5.83	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	1017	-	-	-	161	718
Stage 1	-	-	-	-	545	-
Stage 2	-	-	-	-	455	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1014	-	-	-	145	714
Mov Cap-2 Maneuver	-	-	-	-	344	-
Stage 1	-	-	-	-	492	-
Stage 2	-	-	-	-	454	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1014	-	-	-	344	714
HCM Lane V/C Ratio	0.093	-	-	-	0.061	0.442
HCM Control Delay (s)	8.9	-	-	-	16.1	14
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.2	2.3

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	540	490	20	20	30
Future Vol, veh/h	20	540	490	20	20	30
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	568	516	21	21	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	540	0	-	0	1143	533
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	613	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1028	-	-	-	221	547
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	541	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1025	-	-	-	213	544
Mov Cap-2 Maneuver	-	-	-	-	213	-
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	539	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	17.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1025	-	-	-	335
HCM Lane V/C Ratio	0.021	-	-	-	0.157
HCM Control Delay (s)	8.6	0	-	-	17.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	120	440	430	30	20	80
Future Vol, veh/h	120	440	430	30	20	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	4	7	2	2
Mvmt Flow	125	458	448	31	21	83

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	479	0	-	0	1172	464
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	708	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1083	-	-	-	213	598
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	488	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1083	-	-	-	180	598
Mov Cap-2 Maneuver	-	-	-	-	180	-
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	488	-

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	16.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1083	-	-	-	408
HCM Lane V/C Ratio	0.115	-	-	-	0.255
HCM Control Delay (s)	8.8	0	-	-	16.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	-	1

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	110	340	20	10	340	10	20	0	10	10	0	100
Future Vol, veh/h	110	340	20	10	340	10	20	0	10	10	0	100
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	3	2	2	3	16	64	2	50	9	2	2
Mvmt Flow	116	358	21	11	358	11	21	0	11	11	0	105
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	17.1	13.5	10.8	10
HCM LOS	C	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	67%	23%	3%	9%
Vol Thru, %	0%	72%	94%	0%
Vol Right, %	33%	4%	3%	91%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	470	360	110
LT Vol	20	110	10	10
Through Vol	0	340	340	0
RT Vol	10	20	10	100
Lane Flow Rate	32	495	379	116
Geometry Grp	1	1	1	1
Degree of Util (X)	0.064	0.663	0.529	0.183
Departure Headway (Hd)	7.322	4.935	5.03	5.701
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	490	737	720	631
Service Time	5.348	2.935	3.03	3.72
HCM Lane V/C Ratio	0.065	0.672	0.526	0.184
HCM Control Delay	10.8	17.1	13.5	10
HCM Lane LOS	B	C	B	A
HCM 95th-tile Q	0.2	5.1	3.1	0.7

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	280	300	10	10	40
Future Vol, veh/h	60	280	300	10	10	40
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	2	2	2
Mvmt Flow	63	295	316	11	11	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	330	0	-	0	749	328
Stage 1	-	-	-	-	325	-
Stage 2	-	-	-	-	424	-
Critical Hdwy	4.14	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.236	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1218	-	-	-	379	713
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	660	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1215	-	-	-	353	709
Mov Cap-2 Maneuver	-	-	-	-	353	-
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	658	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1215	-	-	-	590
HCM Lane V/C Ratio	0.052	-	-	-	0.089
HCM Control Delay (s)	8.1	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	573	0	172	0	390	739	286	560	0
Future Volume (veh/h)	0	0	0	573	0	172	0	390	739	286	560	0
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	1870	1870	1870	1870	1870	1841	1870	1841	1870	1870	1856	1856
Adj Flow Rate, veh/h	0	0	0	603	0	0	0	411	0	301	589	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	4	2	4	2	2	3	3
Cap, veh/h	0	842	0	700	0		2	462		327	878	0
Arrive On Green	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.25	0.00	0.18	0.47	0.00
Sat Flow, veh/h	0	1870	0	1418	0	1560	1781	1841	1585	1781	1856	0
Grp Volume(v), veh/h	0	0	0	603	0	0	0	411	0	301	589	0
Grp Sat Flow(s),veh/h/ln	0	1870	0	1418	0	1560	1781	1841	1585	1781	1856	0
Q Serve(g_s), s	0.0	0.0	0.0	47.9	0.0	0.0	0.0	25.3	0.0	19.5	28.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	47.9	0.0	0.0	0.0	25.3	0.0	19.5	28.8	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	842	0	700	0		2	462		327	878	0
V/C Ratio(X)	0.00	0.00	0.00	0.86	0.00		0.00	0.89		0.92	0.67	0.00
Avail Cap(c_a), veh/h	0	962	0	790	0		83	759		341	1191	0
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)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	30.9	0.0	0.0	0.0	42.5	0.0	47.2	23.9	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	8.8	0.0	0.0	0.0	7.6	0.0	28.6	0.9	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	0.0	0.0	0.0	17.8	0.0	0.0	0.0	12.0	0.0	11.0	12.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	39.7	0.0	0.0	0.0	50.1	0.0	75.8	24.8	0.0
LnGrp LOS	A	A	A	D	A		A	D		E	C	A
Approach Vol, veh/h		0			603	A		411	A		890	
Approach Delay, s/veh		0.0			39.7			50.1			42.1	
Approach LOS					D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	26.1	34.0		57.5	0.0	60.1		57.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	22.5	48.5		60.5	5.5	75.5		60.5				
Max Q Clear Time (g_c+I1), s	21.5	27.3		0.0	0.0	30.8		49.9				
Green Ext Time (p_c), s	0.1	2.2		0.0	0.0	3.9		3.1				

Intersection Summary			
HCM 6th Ctrl Delay		43.1	
HCM 6th LOS		D	

Notes

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

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	520	505	705	20	20	40
Future Vol, veh/h	520	505	705	20	20	40
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	440	-	-	280	270	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	547	532	742	21	21	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	766	0	-	0	2385	388
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	1629	-
Critical Hdwy	4.13	-	-	-	6.63	6.93
Critical Hdwy Stg 1	-	-	-	-	5.83	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	845	-	-	-	33	611
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	175	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	843	-	-	-	~ 12	608
Mov Cap-2 Maneuver	-	-	-	-	105	-
Stage 1	-	-	-	-	149	-
Stage 2	-	-	-	-	174	-

Approach	EB	WB	SB
HCM Control Delay, s	8.5	0	23.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	843	-	-	-	105	608
HCM Lane V/C Ratio	0.649	-	-	-	0.201	0.069
HCM Control Delay (s)	16.8	-	-	-	47.7	11.4
HCM Lane LOS	C	-	-	-	E	B
HCM 95th %tile Q(veh)	4.9	-	-	-	0.7	0.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	447	20	3	655	31	7	1	1	21	1	51
Future Vol, veh/h	11	447	20	3	655	31	7	1	1	21	1	51
Conflicting Peds, #/hr	3	0	0	0	0	3	0	0	0	3	0	3
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	95	95	92	92	95	95	92	92	92	95	92	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	471	22	3	689	33	8	1	1	22	1	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	725	0	0	493	0	0	1248	1237	485	1225	1232	712
Stage 1	-	-	-	-	-	-	506	506	-	715	715	-
Stage 2	-	-	-	-	-	-	742	731	-	510	517	-
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	878	-	-	1071	-	-	150	176	582	156	177	432
Stage 1	-	-	-	-	-	-	549	540	-	422	434	-
Stage 2	-	-	-	-	-	-	408	427	-	546	534	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	875	-	-	1071	-	-	128	171	580	151	172	430
Mov Cap-2 Maneuver	-	-	-	-	-	-	128	171	-	151	172	-
Stage 1	-	-	-	-	-	-	539	530	-	413	431	-
Stage 2	-	-	-	-	-	-	353	424	-	532	524	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	31.6	22.9
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	145	875	-	-	1071	-	-	277
HCM Lane V/C Ratio	0.067	0.013	-	-	0.003	-	-	0.278
HCM Control Delay (s)	31.6	9.2	0	-	8.4	0	-	22.9
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	1.1

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	51	417	524	51	52	142
Future Vol, veh/h	51	417	524	51	52	142
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	4	7	2	2
Mvmt Flow	54	439	552	54	55	149

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	609	0	-	0	1132	585
Stage 1	-	-	-	-	582	-
Stage 2	-	-	-	-	550	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	970	-	-	-	225	511
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	578	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	967	-	-	-	207	508
Mov Cap-2 Maneuver	-	-	-	-	207	-
Stage 1	-	-	-	-	516	-
Stage 2	-	-	-	-	576	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	26.6
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	967	-	-	-	366
HCM Lane V/C Ratio	0.056	-	-	-	0.558
HCM Control Delay (s)	8.9	0	-	-	26.6
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.2	-	-	-	3.3

Intersection	
Intersection Delay, s/veh	21.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	101	345	42	12	334	11	30	11	11	21	1	221
Future Vol, veh/h	101	345	42	12	334	11	30	11	11	21	1	221
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.69	0.95	0.95
Heavy Vehicles, %	2	3	2	2	3	16	64	2	50	9	2	2
Mvmt Flow	106	363	44	13	352	12	32	12	12	30	1	233
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	29	18.1	12.6	14.3
HCM LOS	D	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	58%	21%	3%	9%
Vol Thru, %	21%	71%	94%	0%
Vol Right, %	21%	9%	3%	91%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	52	488	357	243
LT Vol	30	101	12	21
Through Vol	11	345	334	1
RT Vol	11	42	11	221
Lane Flow Rate	55	514	376	264
Geometry Grp	1	1	1	1
Degree of Util (X)	0.126	0.815	0.619	0.453
Departure Headway (Hd)	8.278	5.711	5.929	6.172
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	432	637	613	584
Service Time	6.351	3.725	3.947	4.222
HCM Lane V/C Ratio	0.127	0.807	0.613	0.452
HCM Control Delay	12.6	29	18.1	14.3
HCM Lane LOS	B	D	C	B
HCM 95th-tile Q	0.4	8.4	4.2	2.3

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	121	251	4	1	255	10	1	1	1	0	1	72
Future Vol, veh/h	121	251	4	1	255	10	1	1	1	0	1	72
Conflicting Peds, #/hr	6	0	0	0	0	6	0	0	0	6	0	6
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	95	95	92	92	95	95	92	92	92	95	92	95
Heavy Vehicles, %	4	4	2	2	4	2	2	2	2	2	2	2
Mvmt Flow	127	264	4	1	268	11	1	1	1	0	1	76

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	285	0	0	268	0	0	840	807	272	809	804	286
Stage 1	-	-	-	-	-	-	520	520	-	282	282	-
Stage 2	-	-	-	-	-	-	320	287	-	527	522	-
Critical Hdwy	4.14	-	-	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	2.236	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1266	-	-	1296	-	-	285	315	767	299	316	753
Stage 1	-	-	-	-	-	-	539	532	-	725	678	-
Stage 2	-	-	-	-	-	-	692	674	-	535	531	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1259	-	-	1296	-	-	231	276	763	267	277	744
Mov Cap-2 Maneuver	-	-	-	-	-	-	231	276	-	267	277	-
Stage 1	-	-	-	-	-	-	475	469	-	635	673	-
Stage 2	-	-	-	-	-	-	616	669	-	467	468	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.6	0	16.2	10.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	324	1259	-	-	1296	-	-	727
HCM Lane V/C Ratio	0.01	0.101	-	-	0.001	-	-	0.106
HCM Control Delay (s)	16.2	8.2	0	-	7.8	0	-	10.5
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0.3	-	-	0	-	-	0.4

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	455	50	6	658	17	2
Future Vol, veh/h	455	50	6	658	17	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	495	54	7	715	18	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	549	0	1251	522
Stage 1	-	-	-	-	522	-
Stage 2	-	-	-	-	729	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1021	-	190	555
Stage 1	-	-	-	-	595	-
Stage 2	-	-	-	-	477	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1021	-	188	555
Mov Cap-2 Maneuver	-	-	-	-	188	-
Stage 1	-	-	-	-	595	-
Stage 2	-	-	-	-	472	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	24.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	202	-	-	1021	-
HCM Lane V/C Ratio	0.102	-	-	0.006	-
HCM Control Delay (s)	24.8	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	657	0	301	0	540	570	163	570	0
Future Volume (veh/h)	0	0	0	657	0	301	0	540	570	163	570	0
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	1870	1870	1870	1870	1870	1841	1870	1841	1870	1870	1856	1856
Adj Flow Rate, veh/h	0	0	0	692	0	0	0	568	0	172	600	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	4	2	4	2	2	3	3
Cap, veh/h	0	794	0	666	0		2	628		203	919	0
Arrive On Green	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.34	0.00	0.11	0.50	0.00
Sat Flow, veh/h	0	1870	0	1418	0	1560	1781	1841	1585	1781	1856	0
Grp Volume(v), veh/h	0	0	0	692	0	0	0	568	0	172	600	0
Grp Sat Flow(s),veh/h/ln	0	1870	0	1418	0	1560	1781	1841	1585	1781	1856	0
Q Serve(g_s), s	0.0	0.0	0.0	47.5	0.0	0.0	0.0	32.9	0.0	10.6	27.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	47.5	0.0	0.0	0.0	32.9	0.0	10.6	27.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	794	0	666	0		2	628		203	919	0
V/C Ratio(X)	0.00	0.00	0.00	1.04	0.00		0.00	0.90		0.85	0.65	0.00
Avail Cap(c_a), veh/h	0	794	0	666	0		88	913		294	1301	0
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)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	34.5	0.0	0.0	0.0	35.1	0.0	48.7	21.1	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	45.5	0.0	0.0	0.0	9.1	0.0	14.3	0.8	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	0.0	0.0	0.0	27.3	0.0	0.0	0.0	15.5	0.0	5.4	11.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	80.0	0.0	0.0	0.0	44.2	0.0	62.9	21.9	0.0
LnGrp LOS	A	A	A	F	A		A	D		E	C	A
Approach Vol, veh/h		0			692	A		568	A		772	
Approach Delay, s/veh		0.0			80.0			44.2			31.0	
Approach LOS					F			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.2	42.7		52.0	0.0	60.0		52.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	18.5	55.5		47.5	5.5	78.5		47.5				
Max Q Clear Time (g_c+I1), s	12.6	34.9		0.0	0.0	29.0		49.5				
Green Ext Time (p_c), s	0.2	3.3		0.0	0.0	4.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		51.4	
HCM 6th LOS		D	

Notes

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

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	90	643	658	10	20	300
Future Vol, veh/h	90	643	658	10	20	300
Conflicting Peds, #/hr	3	0	0	3	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	440	-	-	280	270	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	95	677	693	11	21	316

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	707	0	-	0	1572	358
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	870	-
Critical Hdwy	4.13	-	-	-	6.63	6.93
Critical Hdwy Stg 1	-	-	-	-	5.83	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	889	-	-	-	111	639
Stage 1	-	-	-	-	454	-
Stage 2	-	-	-	-	409	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	886	-	-	-	99	635
Mov Cap-2 Maneuver	-	-	-	-	288	-
Stage 1	-	-	-	-	404	-
Stage 2	-	-	-	-	408	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	886	-	-	-	288	635
HCM Lane V/C Ratio	0.107	-	-	-	0.073	0.497
HCM Control Delay (s)	9.5	-	-	-	18.5	16.1
HCM Lane LOS	A	-	-	-	C	C
HCM 95th %tile Q(veh)	0.4	-	-	-	0.2	2.8

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	21	571	18	3	542	21	29	1	3	21	1	31
Future Vol, veh/h	21	571	18	3	542	21	29	1	3	21	1	31
Conflicting Peds, #/hr	3	0	0	0	0	3	0	0	0	3	0	3
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	95	95	92	92	95	95	92	92	92	95	92	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	601	20	3	571	22	32	1	3	22	1	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	596	0	0	621	0	0	1263	1257	614	1251	1256	588
Stage 1	-	-	-	-	-	-	655	655	-	591	591	-
Stage 2	-	-	-	-	-	-	608	602	-	660	665	-
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	980	-	-	960	-	-	147	171	492	149	171	509
Stage 1	-	-	-	-	-	-	455	463	-	493	494	-
Stage 2	-	-	-	-	-	-	483	489	-	452	458	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	977	-	-	960	-	-	132	164	491	142	164	506
Mov Cap-2 Maneuver	-	-	-	-	-	-	132	164	-	142	164	-
Stage 1	-	-	-	-	-	-	440	447	-	475	490	-
Stage 2	-	-	-	-	-	-	447	485	-	431	442	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	38.7	23.9
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	142	977	-	-	960	-	-	246
HCM Lane V/C Ratio	0.253	0.023	-	-	0.003	-	-	0.227
HCM Control Delay (s)	38.7	8.8	0	-	8.8	0	-	23.9
HCM Lane LOS	E	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0	-	-	0.8

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	124	478	437	32	21	82
Future Vol, veh/h	124	478	437	32	21	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	4	7	2	2
Mvmt Flow	129	498	455	33	22	85

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	488	0	-	0	1228	472
Stage 1	-	-	-	-	472	-
Stage 2	-	-	-	-	756	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1075	-	-	-	197	592
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	464	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1075	-	-	-	164	592
Mov Cap-2 Maneuver	-	-	-	-	164	-
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	464	-

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	17.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1075	-	-	-	386
HCM Lane V/C Ratio	0.12	-	-	-	0.278
HCM Control Delay (s)	8.8	0	-	-	17.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	-	1.1

Intersection	
Intersection Delay, s/veh	19
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	111	350	49	12	349	11	64	1	16	11	1	101
Future Vol, veh/h	111	350	49	12	349	11	64	1	16	11	1	101
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	3	2	2	3	16	64	2	50	9	2	2
Mvmt Flow	117	368	52	13	367	12	67	1	17	12	1	106
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	24.1	15.9	12.5	10.8
HCM LOS	C	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	79%	22%	3%	10%
Vol Thru, %	1%	69%	94%	1%
Vol Right, %	20%	10%	3%	89%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	81	510	372	113
LT Vol	64	111	12	11
Through Vol	1	350	349	1
RT Vol	16	49	11	101
Lane Flow Rate	85	537	392	119
Geometry Grp	1	1	1	1
Degree of Util (X)	0.183	0.777	0.587	0.203
Departure Headway (Hd)	7.708	5.208	5.401	6.145
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	463	693	666	580
Service Time	5.794	3.26	3.459	4.227
HCM Lane V/C Ratio	0.184	0.775	0.589	0.205
HCM Control Delay	12.5	24.1	15.9	10.8
HCM Lane LOS	B	C	C	B
HCM 95th-tile Q	0.7	7.5	3.8	0.8

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	62	286	4	1	305	10	6	1	1	10	1	41
Future Vol, veh/h	62	286	4	1	305	10	6	1	1	10	1	41
Conflicting Peds, #/hr	3	0	0	0	0	3	0	0	0	3	0	3
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	95	95	92	92	95	95	92	92	92	95	92	95
Heavy Vehicles, %	4	4	2	2	4	2	2	2	2	2	2	2
Mvmt Flow	65	301	4	1	321	11	7	1	1	11	1	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	335	0	0	305	0	0	787	770	306	769	767	333
Stage 1	-	-	-	-	-	-	433	433	-	332	332	-
Stage 2	-	-	-	-	-	-	354	337	-	437	435	-
Critical Hdwy	4.14	-	-	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	2.236	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1213	-	-	1256	-	-	309	331	734	318	332	709
Stage 1	-	-	-	-	-	-	601	582	-	681	644	-
Stage 2	-	-	-	-	-	-	663	641	-	598	580	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1210	-	-	1256	-	-	274	308	732	299	309	705
Mov Cap-2 Maneuver	-	-	-	-	-	-	274	308	-	299	309	-
Stage 1	-	-	-	-	-	-	562	544	-	635	641	-
Stage 2	-	-	-	-	-	-	619	638	-	556	542	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0	17.3	12.3
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	302	1210	-	-	1256	-	-	548
HCM Lane V/C Ratio	0.029	0.054	-	-	0.001	-	-	0.1
HCM Control Delay (s)	17.3	8.1	0	-	7.9	0	-	12.3
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	599	44	5	559	69	8
Future Vol, veh/h	599	44	5	559	69	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	651	48	5	608	75	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	699	0	1293	675
Stage 1	-	-	-	-	675	-
Stage 2	-	-	-	-	618	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	898	-	180	454
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	538	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	898	-	179	454
Mov Cap-2 Maneuver	-	-	-	-	179	-
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	534	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	37.8
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	191	-	-	898	-
HCM Lane V/C Ratio	0.438	-	-	0.006	-
HCM Control Delay (s)	37.8	-	-	9	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	2	-	-	0	-

APPENDIX C: DETAILED TRIP GENERATION TABLE



WHITMORE REDEVELOPMENT TRIP GENERATION FORECAST

Trip Generation Rates

Land Use [ITE Land Use and Code]	Units[1]	Daily Rate	AM Peak Hour			PM Peak Hour		
			Total	Inbound	Outbound	Total	Inbound	Outbound
Workforce Housing (Microapartments) [Multi-Family Housing (Mid-Rise) - 221]	DU	5.44	0.36	0.09	0.27	0.44	0.27	0.17
Research & Innovation Hub [Research & Development Center - 760]	KSF	19.38	0.42	0.32	0.11	0.49	0.07	0.42
Food Hub and Warehouse / Logistics Yard [Warehousing - 150]	KSF	1.71	0.19	0.15	0.04	0.20	0.05	0.14
Farmer's Market [Supermarket - 850]	KSF	106.78	3.82	2.29	1.53	9.24	4.71	4.53
Anchor Tenant Food Processing and Tenant Food Producer [General Light Industrial - 110]	KSF	4.75	0.52	0.45	0.06	0.43	0.06	0.38
Food Hub Visitor Center [Winery - 970]	KSF	45.96	2.07	1.45	0.62	7.31	3.66	3.66

Forecast Trip Generation

Land Use	Size	Units	Daily Trips	AM Peak Hour			PM Peak Hour		
				Total	Inbound	Outbound	Total	Inbound	Outbound
Workforce Housing (Microapartments)	100	DU	544	36	9	27	44	27	17
Research & Innovation Node	22.4	KSF	434	9	7	2	11	2	9
Food Hub and Warehouse / Logistics Yard[2]	360	KSF	614	69	53	16	71	19	52
Farmer's Market[3]	6	KSF	641	23	14	9	55	28	27
Anchor Tenant Food Processing and Tenant Food Producer	60	KSF	285	31	27	4	26	3	23
Food Hub Visitor Center	10	KSF	460	21	14	6	73	37	37
Subtotal Project Trips			**2,977**	**189**	**125**	**64**	**280**	**116**	**165**
Reductions									
33% trip reduction for 50 on-site employees[4]			*-90*	*-6*	*-2*	*-4*	*-7*	*-4*	*-3*
Internal Capture[5]			*-40*	-10	-7	-3	-6	-2	-4
Walk/Bike/Transit Trips[5]			*-74*	-9	-6	-3	-15	-6	-9
Existing land use trips[6]			*-195*	-26	-7	-19	-13	-11	-2
Subtotal Reductions			-399	-51	-21	-30	-41	-24	-17
Total Net New Project Trips			**2,578**	**138**	**104**	**34**	**239**	**92**	**147**

[1]DU =dwelling units, KSF = 1,000 square feet

[2]Trips associated with proposed Logistics Yard are included in the warehouse trip generation rate shown.

[3]Farmers Market will be open daily

[4]Half of the workforce housing units are expected to be occupied by employees working on-site. A 33% trip reduction was applied to half of the dwelling units for on-site employees who will not commute to the project site.

[5]Internal capture and active/transit trip reductions calculated using MainStreet web app (see text for details).

[6] Existing trips generated by the current project site. Based on peak hour traffic volumes and the assumption that the peak hour volumes represent 20% of the site's daily trip generation.

APPENDIX F

Preliminary Engineering Report



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PRELIMINARY ENGINEERING REPORT

WHITMORE COMMUNITY FOOD HUB COMPLEX

WAHIAWĀ, ISLAND OF O'AHU, HAWAII

TMK: (1) 7-1-009, 004 (por.), 022, 023

March6, 2019

SAM O. HIROTA, INC.
Engineers and Surveyors
864 South Beretania Street
Honolulu, Hawaii 96813
(808)537-9971

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1. Introduction

1.1Project Location

The proposed Wahiawā Community Food Hub is located withinWahiawāon the Island of O'ahu along Whitmore Avenue, approximately half a mile away from the intersection of Kamehameha Highway and Whitmore Avenue (See Exhibit 1Regional Location Map). Development of the project includes improvements on TMKs: (1) 7-1-002:009, 004 (por.), 022, and 023 which is an area of approximately 34 acres. Boundaries include Whitmore Avenue to the North, Lalawai Street to the East, and the West lot line of TMK 7-1-002:009 (See Exhibit 2 Parcel Map).

1.2 Project Description

The proposed Whitmore Community Food Hub Complex plans to increasethe distribution of local food products. A centralized food hub will combine post-harvesting handling, processing, storing, and distribution into one location which benefits both the producer and consumer by not having to distribute and process through wholesalers. There are currently 18 existing structures on site, however, most of them are in poor condition. The proposed development plans to renovate 2 of the existing structures (machine shop and outdoor shed – see Exhibit 2 for location) and demolish the remainder. New facilities include:The Food Hub and Warehouse, Food Hub Visitor Center, Anchor Tenant Food Processing, Logistics Yard, Research and Innovation Node, Tenant Food Producer, Farmer's Market with Visitor Parking, Workforce Housing with Parking, Water Storage Tanks and Treatment Ponds, a renovated Machine Shop, a renovated Outdoor Shed, and an overlook of Kaukonahua Stream (See Exhibit 8 Conceptual Master Plan).

1.3 Existing Topography and Soils

The existing site is moderately sloped from the North-East to the South-West with ground elevations ranging from 1,010 feet to 930 feet MSL(See Exhibit 3 Topography Map). The ground surface consists of existing vegetation, buildings and pavement.The existing site is located within Zone D of the Federal Emergency Management Agency (FEMA) flood boundaries as shown on FEMA panel number 15003C0120 and 15003C0140F (see Exhibit 4a and 4b Flood Hazard Assessment Tool (FHAT) Report). Zone D is classified as unstudied areas where flood hazards are undetermined, but flooding is possible. However, the elevation of the stream south of the site is approximately 845 feet MSL (see Exhibit 3 Topography Map), which significantly lower that the elevation of the project site.

The United States Geological Survey by the Natural Resources Conservation Service (NRCS) describes the surface soils as Wahiawā silty clay (WaA), Kolekole silty clay loam (KuB), Leilehua silty clay (LeB), and Helemano silty clay (HLMG) (See Exhibit 5 NRCS Soil Survey). Wahiawā silty clay covers approximately 7 percent of the total site and is described as 0 to 3 percent slopes, with slow runoff, and moderately rapid permeability. Kolekole silty clay loam covers approximately 11.5 percent of the site and is described as 1 to 6 percent slopes with moderately rapid permeability with slow runoff. Leilehua silty clay covers approximately 9.5 percent of the site and is described as 2 to 6 percent slopes with moderately rapid permeability with slow runoff. Lastly, Helemano silty clay covers 9 percent of the site and is described as 30 to 90 percent slopes and located on the sides of V shaped gulches with moderately rapid permeability and medium to very rapid runoff.

2. Wastewater

2.1 Existing Conditions

Prior to the development of the Kahi Kani subdivision west of Whitmore Village and the nearby naval communications station (NAVCAMS), the sewage generated in the Whitmore Village area was treated at the Whitmore Village Wastewater Treatment Plant (WWTP). The Whitmore Village WWTP was a secondary treatment plant with an extended aeration process that was operated by the City and County of Honolulu, Division of Wastewater Management (Kwock Associates, Inc. Consulting Engineers 1990). “The Division of Wastewater Management assum[ed] that the existing Whitmore Villagepopulation contribut[ed] approximately 0.201 mgd, or 100 percent of the plant’s treatmentcapacity” (Pedersen 1990). The development of the KahiKani subdivision resulted in an increase in sewage flowthatexceeded the capacity of the treatment plant. The Whitmore WWTP was eventually abandoned in 1994 and the Whitmore Village sewage was rerouted to the Wahiawā WWTP. The abandoned Whitmore WWTP is located within the project site, south of the intersection of Whitmore Avenue and Ihiihi Avenue closer to Kaukonahua Stream (see Exhibit 6 Whitmore WWTP Location).

Currently, there is an existing 15-inch gravity sewer line owned and maintained by the City and County of Honolulu, Division of Wastewater Management that runs along Whitmore Avenue, north of the project area. The gravity line flows west-southwest until the intersection of Whitmore Avenue and Kamehameha Highway, then continues south along Kamehameha Highway eventually reaching the Wahiawā WWTP along California Avenue (See Exhibit 7Wahiawā WWTP Location).

2.2 Design Wastewater Flows

The proposed Whitmore Community Food Hub design wastewater flow quantities were calculated using the Wastewater Flow Standards (Reference 7) set forth by the City and County of Honolulu as shown below:

1. Base Sanitary Flow (BSF): The portion of wastewater flow that includes domestic, commercial, and industrial sewage, but excludes infiltration and inflow. The average wastewater flow of 70 gpcd was multiplied by the land use density of 100 cpa and proposed total building area of 11.5 acres.
2. Peak Base Sanitary Flow (PBSF): The PSBF was determined by multiplying the BSF by a flow factor of 2.5.
3. Average Dry Weather Flow (ADWF): The ADWF was determined by summing the BSF and the groundwater infiltration rate (see 4 below).
4. Groundwater Infiltration (GWI): The GWI rate used was 35gallons per capita per day (gpcd), which was based on the average of the low nighttime flows per day for the same period as the ADWF, minus signification industrial or commercial nighttime flows.
5. Peak Dry Weather Flow (PDWF): The PDWF is the sum of the PBSF and GWI rate.
6. Wet Weather Infiltration/Inflow(I/I): The wet weather I/I peak hourly rate used was 3,000 gallons per acre per day (gpad).
7. Design Flow: The design flow is the sum of the PDWF and wet weather I/I.

The design flow of wastewater was calculated to be 275,846 gallons per day (gpd), as summarized in the table below.

Design Wastewater Calculations		
	Value:	Notes:
Base Sanitary Flow (gpd):	80,455	General Industry land use
Peak Base Sanitary Flow (gpd):	201,138	Flow Factor = 2.5
Average Dry Weather Flow (gpd):	120,683	
Groundwater Infiltration (gpcd):	35	
Peak Dry Weather Flow (gpd):	241,365	
Wet Weather I/I (gpad):	3,000	
Design Flow (gpd):	275,846	

2.3 Proposed Improvements

The wastewater produced by the Food Hub was intended to flow through a new 8-inch sewer line and connect to the existing City and County of Honolulu 15-inch sewer line along Whitmore Avenue.However, a moratorium on the 15-inch line is currently in place and is currently inadequate to support the increase in sewage due to the development of theFood Hub Complex (see Appendix 1 Sewer Denial Letter).The Sewer Connection Letter did not indicate dates lifting the moratorium. The following are two possible alternatives for the interim until the moratorium is lifted. The alternatives are subject to several agency approvals.

1) Construct a new gravity line that runs parallel to the existing 15” gravityline directly from the project site to theWahiawā WWTP. This option would prevent further additional improvements within the project site and instead, connect to an existing treatment system. However, the length of the proposed line would be approximately two miles long and would require a siphon system at the Karsten Thot Bridge, similarly to the existing 15” line, to convey the flow over the stream and continue towards theWahiawā WWTP (see Exhibit 7 Wahiawā WWTP Location for proposed alignment).This alternative would require approvals from the Department of Transportation (DOT) for work within the state right of way along Whitmore Avenue and Kamehameha Highway and Wastewater Branch for additional flow entering the existing Wahiawā WWTP. According to Kwock Associates, Inc. Consulting Engineers, the existing 15” sewer line had “a total estimated construction cost of $1,125,000” (1990). Capacity of the Wahiawā WWTP will influence this alternative as well. The capacity of the Wahiawā WWTP will need to be verified to determine if the additional flow from the proposed Food Hub could be treated here. Inflation over time and unforeseen conditions during construction would increase the cost for this alternative.
2) Construct a new R-1 wastewater treatment system at the abandoned Whitmore WWTP location in compliance with the Guidelines for the Treatment and Use of Recycled Water (DOH Wastewater Branch 2002).This alternative would eliminate the need for connectionto the existing system due to the moratorium. Since the wastewater system would be located at the low point of the site, gravity flow would not be an issue.The treated water produced from the proposed system could be used for any form of outdoor irrigation(DOH Wastewater Branch 2002).It is important to note thatDOH would need to approve the proposed system. If there is an existing sewer system within the vicinity of the proposed site, DOH typically does not allow for a separate system. However, due to the limitations of the existing system as stated previously, this alternative would need to be investigated further to obtain any approvals. The construction of the treatment

system would also contribute to added cost of the overall project and proper disposal of solids will have to be implemented as needed. Overall, this option would be more cost effective and feasible in comparison to Alternative 1, pending approvals from DOH. Two possibilities for the treated R-1 water are further explained below:

2a) The treated R-1 water would beutilized for outdoor irrigation. The treatment would have to comply with the R-1 requirements and precautions set forth in theGuidelines for the Treatment and Use of Recycled Water. The treated water could be used for spray, drip, surface, and subsurface irrigation (DOH Wastewater Branch 2002).

2a) Disposal of the treated water through a drywell-type system into the ground. Any remaining treated R-1 water not used for irrigationwould be disposed into the ground surface in compliance with the Guidelines for the Treatment and Use of Recycled Water(DOH Wastewater Branch 2002).

3. Water

3.1 Existing Conditions

An existing Board of Water Supply (BWS) 12” water main is located on along Whitmore Avenue and adjacent to the west end of the project site. There are two fire hydrants currently onsite (FH #C395, the other is not identified). The fire hydrants nearest to the project are located along Whitmore Avenue and indicated as FH #CO3090 and #CO3091 (See Exhibit 2 Parcel Map for hydrant locations).

3.2 Design Water Flows

The potable water demands were designed using the "Water System Standards" dated 2002. The average daily demand was determined using the domestic consumption guidelines in the standards (83,579 gpd), then revised based on knowledge of the average daily demand of a similar site/facility. In verbal discussions with BWS, the Dole Fresh Fruit Facility and Plantation uses approximately 170,000 gpd which is significantly higher than the 83,579 gpd provided. BWS will not approve the demands as it currently reflects unless additional justification is provided. Until further analysis could be provided for this study, we are assuming approximately double the current potable demand in order to obtain BWS's approval. A new request had be submitted to BWS confirming the revised demand. The average daily demand is shown in the Potable Water Demands table below. The maximum and peak hour demands were calculated by multiplying the average daily demand by 1.5 and 3, respectively. Potable water availability is subject to approval from BWS.

Potable Water Demands	
Average Daily Demand (gpd):	167,158
Maximum Daily Demand (gpd):	250,767
Peak Hour Demand (gpd):	510,474

The fire flow demand was determined by referencing the Fire Flow Requirements in the "Water System Standards" dated 2002. The fire flow quantities are summarized in the table below.

Fire Flow Demands	
Required Flow (gpm):	4,000
Duration (hrs):	3
Fire Hydrant Spacing (ft):	250

3.3 Proposed Improvements

The proposed food hub is anticipated to require both building and site fire protection as well as potable water. In initial discussions with BWS, approximately 2,500 gpm of fire flow is currently available for the site.This is subject to change per BWS's final response to the water availability request. Note that there has not been an official response received from BWS to this date.

Since BWS is not currently able to satisfy the offsite fire flow requirement of 4,000 gpm, a possible option is to drill a non-potable water well onsite in accordance with the DLNR Hawaii Well Construction & Pump Installation Standards (2004). Requirements for construction of a non-potable water well includes a well construction permit, a well completion report and a pumping test. The location of the non-potable water well shall be at the farthest distance upstream from wastewater lines or chemical storage, allotting enough room for well modification and maintenance. To withdraw the non-potable water using a pump, a pump installation permit is required.Any discharge lines from the well requires an approved water meter to provide non-potable water withdrawal quantities (Hawaii Well Construction & Pump Installation Standards (2004). Water pumped from the well would be held in storage tank(s)sized to hold the required volume of fire flow(720,000 gallons) at a minimum. The water would then be distributed to onsite fire hydrants and building sprinkler systems, as necessary. The fire water system will be a separate system from the potable system provided by BWS.

The proposed potable lateral onsite would be connected to the existing BWS 12-inch main along Whitmore Avenue. A meter, meter box, and backflow preventer will likely need to be installed. Potable water would support proposed building facilities including

bathrooms, food processing, and commercial components to the facility. The potable water would also serve as a source of additional irrigation that is not satisfied by the R-1 system explained in section 2.3 above, assuming all agency approvals are obtained.

4. Drainage

This section provides a drainage analysisand general guidance for selecting and implementing Post-Construction BMPs to account for the development of the proposed Whitmore Community Food Hub Complex. After analyzing the existing site conditions and proposed improvements, various Low Impact Development(LID) techniques can be considered and applied to mitigate the potential for poor water quality runoff into streams. LIDs are systems and practices that mimic natural processes that result in the infiltration, evapotranspiration, or use storm water in order to protect water quality and the aquatic habitat (Rules Relating to Water Quality 2017). LIDs retain and/or treat the increase in stormwater runoff as a result of the impervious areas of the proposed improvements.

4.1 Existing Hydrology

Existing site drainage generally flows from the North-East end of the site and eventually flows into the KaukonahuaStream. Pre-development (or existing) condition can be separated into two main drainage basins split by a gulch near the middle of the site. The existing drainage pattern and basins can be seen on Exhibit 9 (Existing Drainage).The existing condition storm runoff was estimated using the rational method as outlined in City and County of Honolulu “Storm Drainage Standards” (Reference 6). Per the county standards, the Rational Method along with the 10-year recurrence interval with intensity of 1-hr rainfall was used. Under existing condition, the total estimated runoff was 45.34 cfs (see Appendix 2 Runoff Calculations).

Basin 1 (23.10 cfs) includes runoff from the West Lot line of Lot 009 to the West edge of the gulch and accounts for nearly one-third of the project area. The high points of the basin lay along Whitmore Avenue allowing runoff to sheet flow in the South-West direction, eventually running off the West/South-West end of the site.

Basin 2 (22.23 cfs) distinguishes stormwater falling on the East end of the site and accounts for the remainder of the site. After falling on the East end of the site, stormwater sheet flows in the South-West direction where it enters a gulch which leads into Kaukonahua Stream.

4.2 Developed Conditions Hydrology

The development of the proposed site includes the construction of several new buildings, structures and impervious areas as indicated on Exhibit 8 (Conceptual Master Plan). As a result, the existing drainage system will be altered due to the impervious surfaces that will be constructed as part of the proposed development.The post-development (proposed) condition storm runoff was estimated using the rational method as outlined in City and County of Honolulu “Storm Drainage Standards” (Reference 6). The 10-year recurrence interval with intensity of 1-hr rainfall was used. Calculations are included in Appendix 3. Under proposed condition, the site is predicted to generate a total of 81.53 cfs without LID mitigation.

A retention basin is an engineered shallow depression that collects and filters storm water runoff using conditioned planting soil beds and vegetation. This is ideal for a large site with a large amount of impervious area. The retention basin will contain the additional runoff produced from the site and filter into the ground onsite (see Appendix 3 Retention Basin Schematic).Retention basins will be placed in each drainage area (see below), retaining more than the total Water Quality Volume (WQV) and preventing theadditional runoff from flowing offsite.

Drainage Area 1 (4.19 cfs) includes runoff from the proposed Farmer’s Market/Visitor Parking Area and entry feature (see Conceptual Master Plan for location of areas) in the northwest portion of the project site. Stormwater will sheet flow in the South-West direction towards the west end of the project site and into a retention basin (see Exhibit 10 Proposed Drainage).

Drainage Area 2 (4.49 cfs)includes stormwater from the visitor center and renovated machine shop east of Drainage Area 1 and south of Whitmore Avenue. The runoff within Drainage Area 2 follows the same drainage pattern as Drainage Area 1, sheet flowing in the South-West direction and into a retention basin.

Drainage Area 3 (51.92 cfs) consists of stormwater from the Food Hub and Warehouse and logistics yard, accounting for about 40 percent of the project area.The terrain is sloped in the South-West direction and will divert the storm water runoff into a retention basin onsite.

Drainage Area 4 (5.42 cfs) includes the workforce housing/parking, water storage tanks and treatment ponds, and the Kaukonahua Stream overlook. The stormwater will sheet flow south and into a retention basin.

Drainage Area 5 (9.32 cfs) consists of stormwater from the Tenant Food Producer and Anchor Tenant Food Processing areas. Stormwater will sheet flow west into a retention basin within the drainage area.

Drainage Area 6 (6.19 cfs) includes runoff generated from the Research and Innovation Node and the renovated existing outdoor shed. Like Drainage Area 5, stormwater will sheet flow west into a retention basin.

4.3 Conclusion

The improvements will potentially increase the 10-year, 1-hour runoff from 45.34 cfs to 81.53 cfs without mitigation. With LID measures in place, post development runoff will be decreased to vel under the pre-development. These are based on the calculations for estimating runoff in Appendix 2. Six total retention basins will be placed accordingly throughout the project site. The retention basins will be used to treat storm water that sheet flows throughout the site and sized to contain a total WQV of 59,000 cubic feet. With the proposed retention basins in place, the proposed development will not adversely impact the surrounding areas, neighboring properties or the existing drainage system.

References

1. “Environmental Assessment Modification of Whitmore Village Wastewater Treatment Plant”, James H. Pedersen, February 1990.

2. “Final Environmental Assessment for Whitmore Village WWTP Diversion System”, Kwock Associates, Inc. Consulting Engineers, August 1990.

3. “Guidelines for the Treatment and Use of Recycled Water”, Hawaii State Department of Health Wastewater Branch, May 2002.

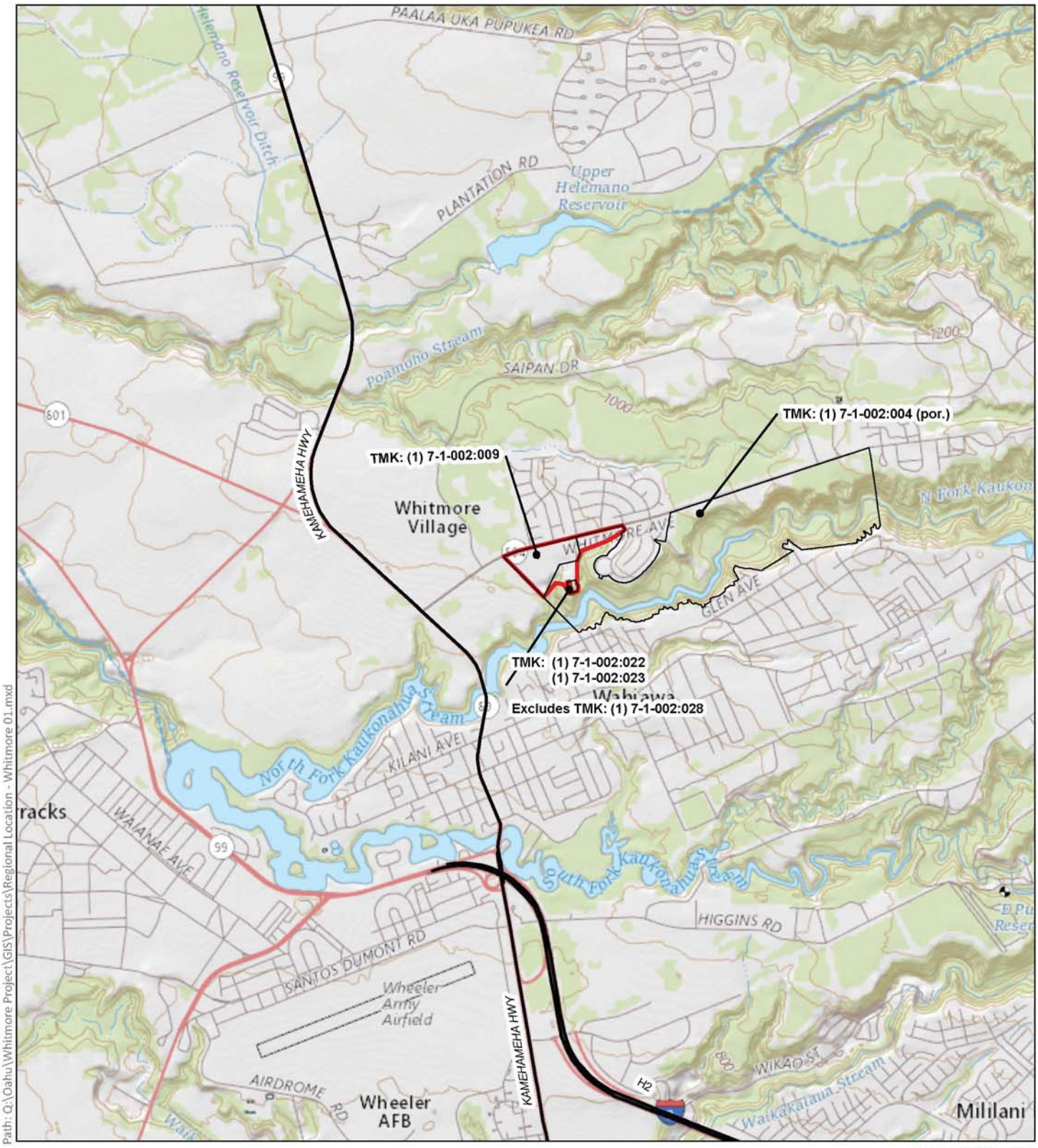
4. “Rules Relating to Water Quality”, Department of Planning and Permitting, City and County of Honolulu, August 2017.

5. “Soil Survey of the Island of Hawaii, State of Hawaii”, U.S. Department of Agriculture, Soil Conservation Service, December 1973.

6. “Storm Drainage Standards”, Department of Planning and Permitting, City and County of Honolulu, August 2017.

7. “Wastewater System Design Standards”, Department of Environmental Services, City and County of Honolulu, July 2017.

EXHIBIT 1 - REGIONAL LOCATION MAP



DATE: 8/9/2018

LEGEND

- Project Scope
- Impacted Parcels
- Major Roadways



Source: ESRI. United States Geological Survey, 2017. City and County of Honolulu, 2017.

Figure 1:
Regional Location Map

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation — O'ahu

North — Linear Scale (feet)

0 750 1,500 3,000

PBR HAWAII & ASSOCIATES, INC.



EXHIBIT 2 - PARCEL MAP

EXHIBIT 3 - TOPOGRAPHY MAP



PDF: Q:\Oahu\Whitmore Project\PDF\Figures
Path: Q:\Oahu\Whitmore Project\GIS\Projects\Topo - Whitmore 01.mxd

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

DATE: 9/10/2018

LEGEND

- Project Scope
- Contours 5Ft



Source: ESRI. United States Geological Survey, 2017. City and County of Honolulu, 2017.

Figure :
Topography

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation — O'ahu

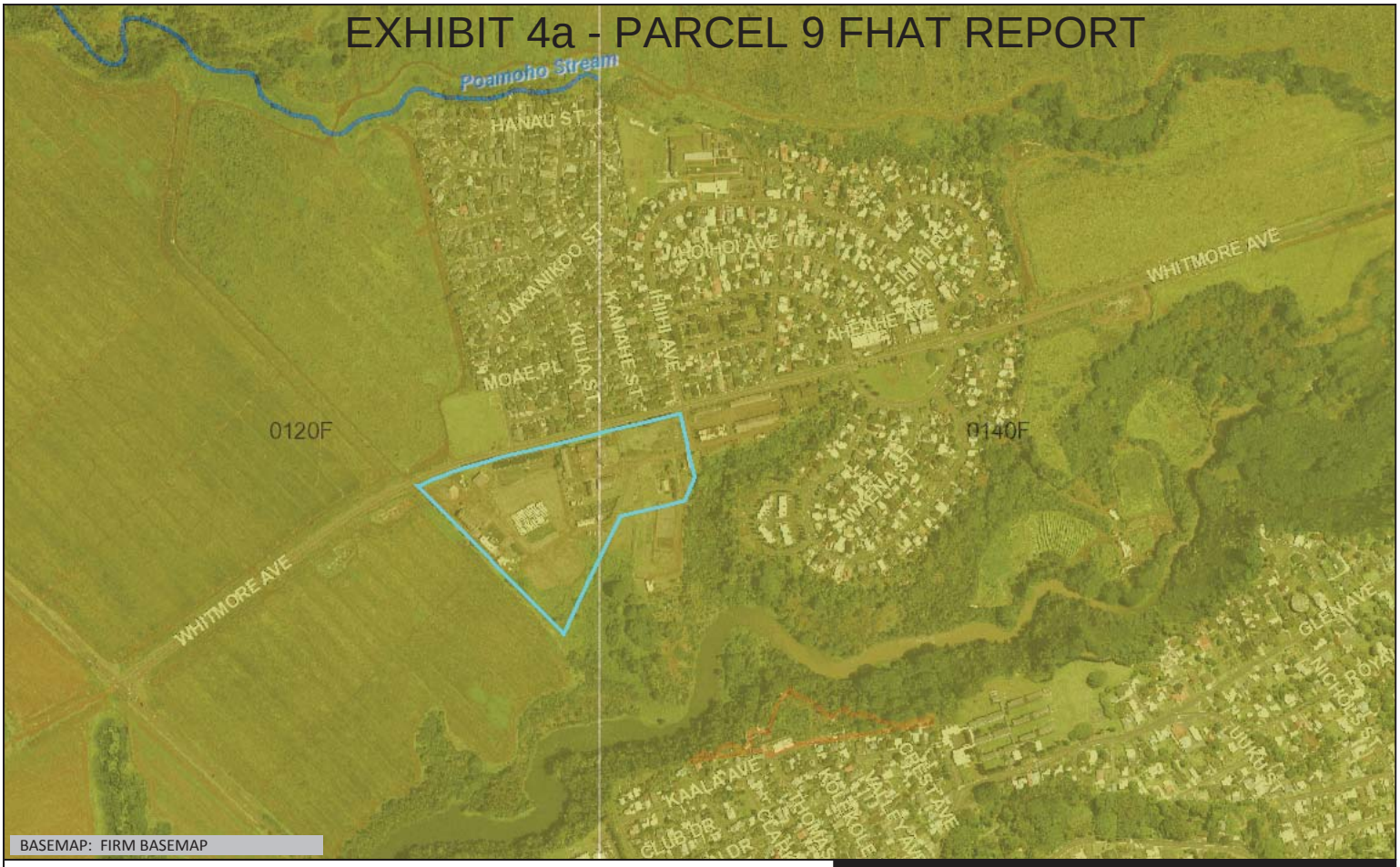
North

Linear Scale (feet)

0 100 200 400

PBR HAWAII & ASSOCIATES, INC.

EXHIBIT 4a - PARCEL 9 FHAT REPORT



Flood Hazard Assessment Report

www.hawaiinfip.org

Whitmore Agricultural

Property Information

COUNTY:	HONOLULU
TMK NO:	(1) 7-1-002:009
WATERSHED:	KAUKONAHUA
PARCEL ADDRESS:	WHITMORE AVE WAHIAWA, HI 96786

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL - EFFECTIVE DATE:	15003C0120F - SEPTEMBER 30, 2004 15003C0140F - SEPTEMBER 30, 2004

THIS PROPERTY IS WITHIN A TSUNAMI EVACUTION ZONE: NO
FOR MORE INFO, VISIT: http://www.scd.hawaii.gov/

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
FOR MORE INFO, VISIT: http://dlnreng.hawaii.gov/dam/

0 600 1,200 ft

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

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

FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND
(*Note: legend does not correspond with NFHL)*

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

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

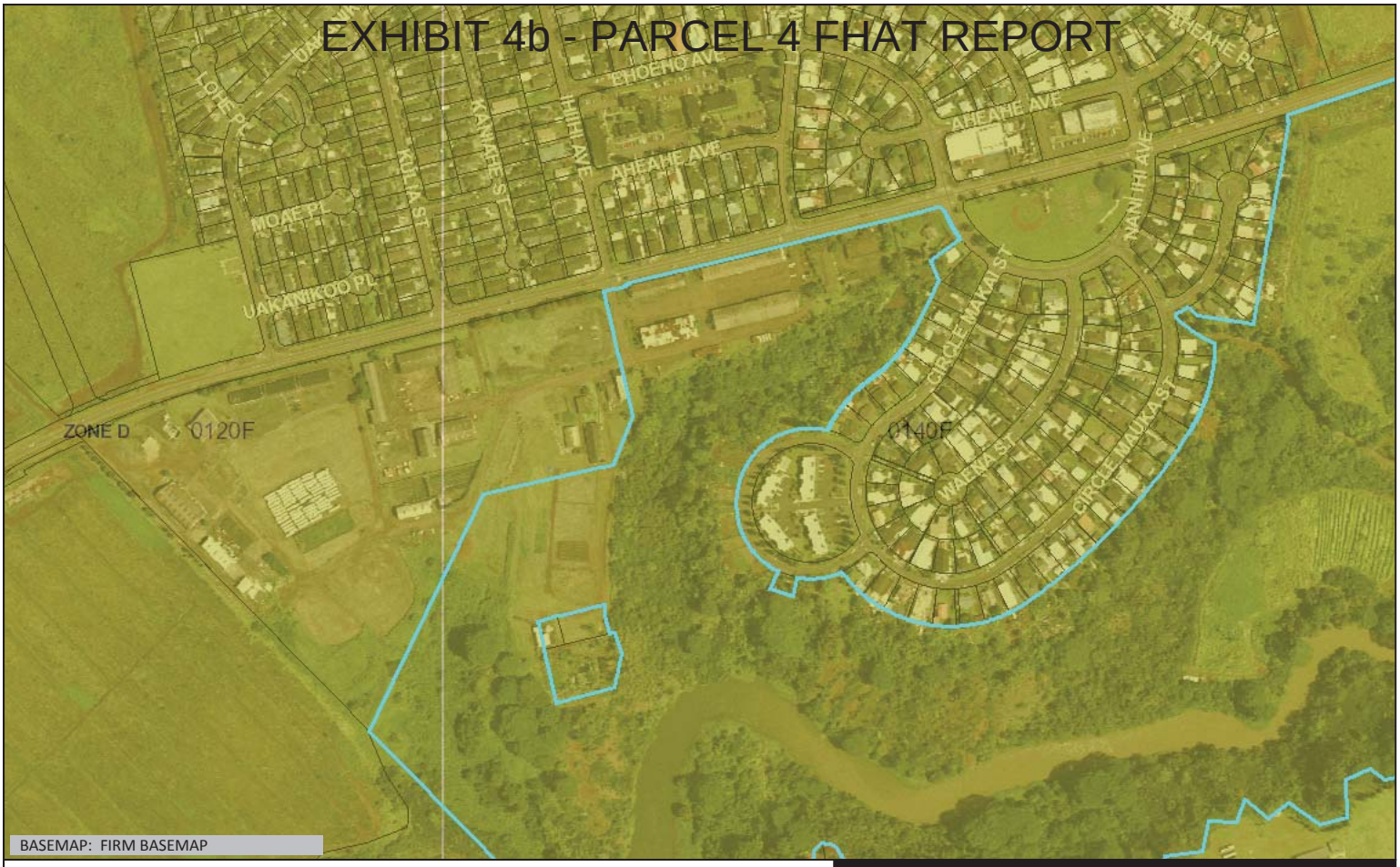
NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

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

OTHER FLOOD AREAS

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

EXHIBIT 4b - PARCEL 4 FHAT REPORT



Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	HONOLULU
TMK NO:	(1) 7-1-002:004
WATERSHED:	KAUKONAHUA; POAMOHO
PARCEL ADDRESS:	WHITMORE AVE WAHIAWA, HI 96786

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	99-09-692A
FEMA FIRM PANEL - EFFECTIVE DATE:	15003C0120F - SEPTEMBER 30, 2004 15003C0140F - SEPTEMBER 30, 2004

THIS PROPERTY IS WITHIN A TSUNAMI EVACUTION ZONE: NO
FOR MORE INFO, VISIT: http://www.scd.hawaii.gov/

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
FOR MORE INFO, VISIT: http://dlnreng.hawaii.gov/dam/

0 400 800 ft

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

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

FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND
(*Note: legend does not correspond with NFHL)*

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

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

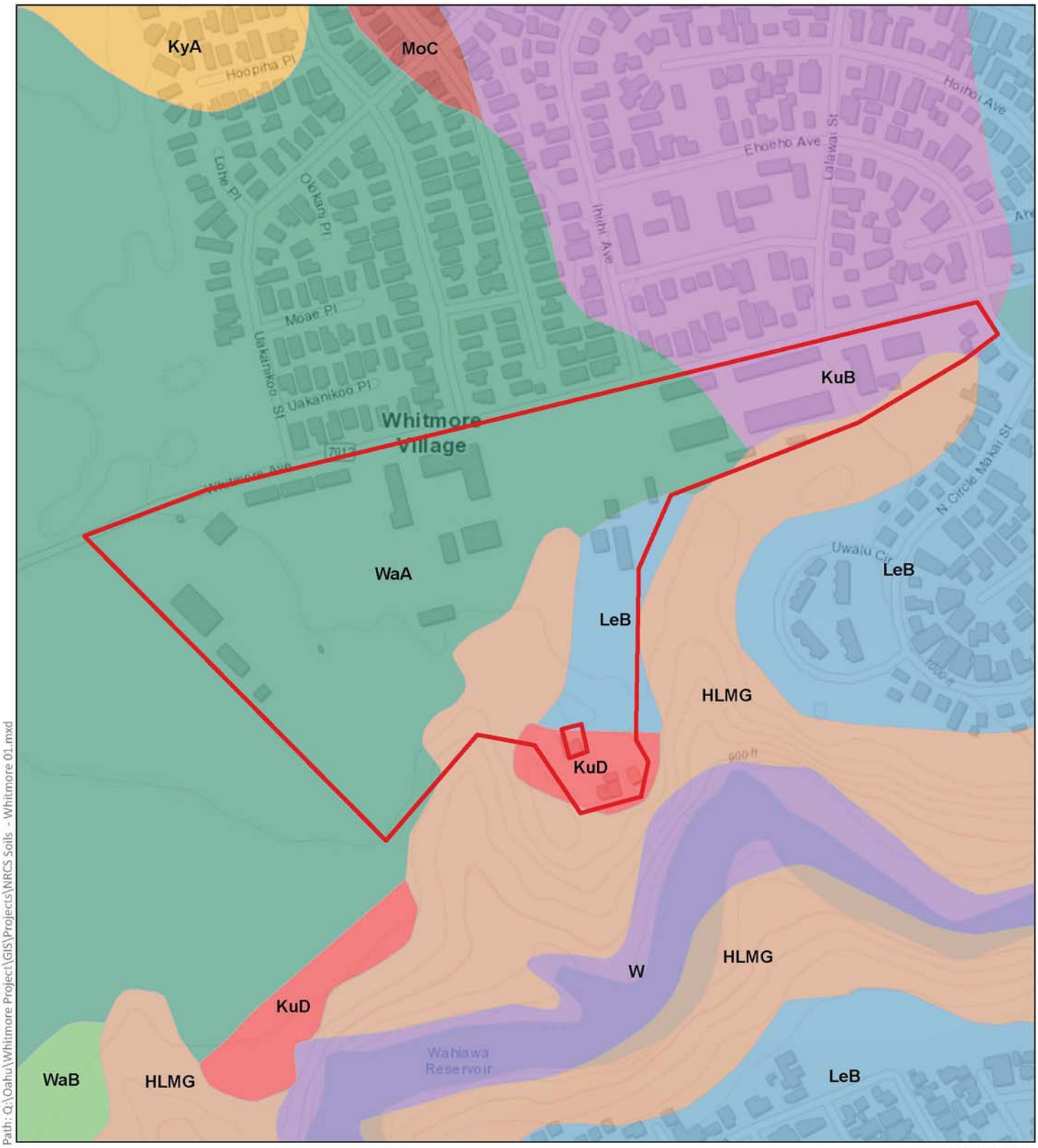
NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

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

OTHER FLOOD AREAS

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

EXHIBIT 5 - NRCS SOIL SURVEY



PDF: Q:\Oahu\Whitmore Project\PDF\Figures
Path: Q:\Oahu\Whitmore Project\GIS\Projects\NRCS Soils - Whitmore 01.mxd

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.
Source: ESRI, United States Geological Survey, 2017.United States Department of Agriculture, Natural Resources Conservation Service.

DATE: 9/10/2018

LEGEND

- Project Scope
- Major Roadways

Soils

- Helemano silty clay (HLMG)
- Kolekole silty clay loam (KuB)
- Kolekole silty clay loam (KuD)
- Kunia silty clay (KyA)
- Leilehua silty clay (LeB)
- Manana silty clay loam (MoC)
- Wahiawa silty clay (WaA)
- Wahiawa silty clay (WaB)
- Water (W) > 40 acres

Figure :
NRCS Soil Survey

WHITMORE COMMUNITY FOOD HUB COMPLEX

Agribusiness Development Corporation
North
Linear Scale (feet)
0 100 200 400

O'ahu

PBR HAWAII & ASSOCIATES, INC.

EXHIBIT 5a - NRCS SOIL MAP

Soil Map—Island of Oahu, Hawaii



Map Scale: 1:4,370 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 4N WGS84

EXHIBIT 5b - NRCS SOIL MAP LEGEND

Soil Map—Island of Oahu, Hawaii

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Island of Oahu, Hawaii
Survey Area Data: Version 13, Sep 11, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Aug 14, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HLMG	Helemano silty clay, 30 to 90 percent slopes	2.9	9.3%
KuB	Kolekole silty clay loam, 1 to 6 percent slopes	3.7	11.5%
LeB	Leilehua silty clay, 2 to 6 percent slopes	3.0	9.4%
WaA	Wahiawa silty clay, 0 to 3 percent slopes	22.2	69.9%
Totals for Area of Interest		**31.8**	**100.0%**

EXHIBIT 6 WHITMORE WWTP

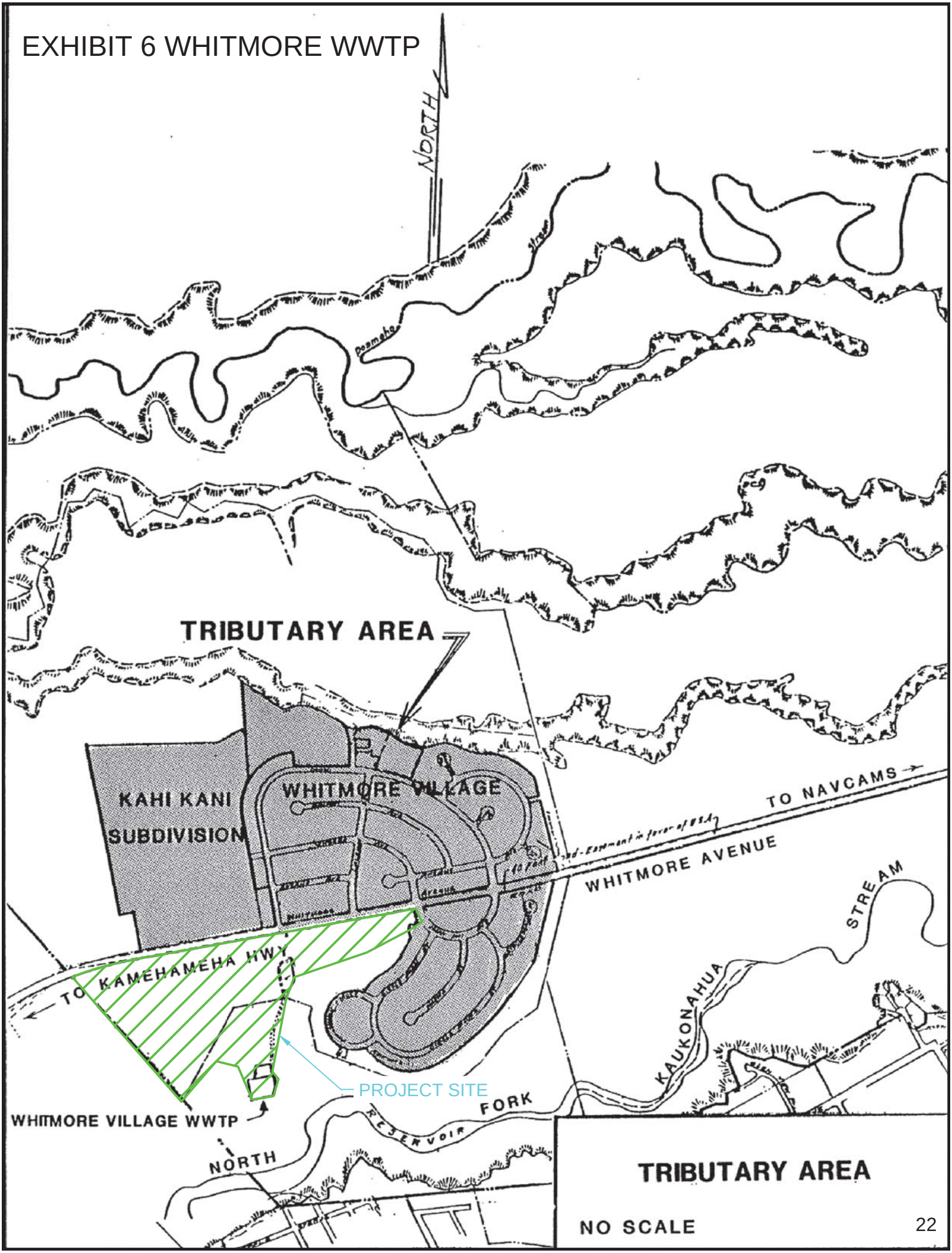



EXHIBIT 7 - WAHIAWA WWTP
PROJECT SITE
DISTANCE=2 MILES
111 California Ave
WAHIAWA WWTP
801
804
80
99
H2
750
Saipan Dr
Whitmore Ave
Kamiane St
Kula St
Ehoeho Ave
Hoiho Ave
Aheane Ave
Ihi Ave
Circle Mauka St
Glen Ave
Clark Pl
Nichols
Nakula
Clark St
Kelog St
Thomas St
Koloa Dr
Valley Ave
KOA St
Lehua St
N Cane St
Mango St
Kukui St
Holoku Pl
Mala St
Iima St
Kaliloa St
Kalihea St
Lauoho Loop
California Ave
Kilani Ave
Cypress Ave
Olive Ave
Makani Ave
Kuahiwi Ave
Mulinui Ave
Lemiwai St
Plum St
Peach St
Inoiho Pl
Circle Dr
Rose St
Hauola Ave
Nanea Ave
Makaweo Ave
Loko Dr
Walker Ave
Little Dr
Charlton Rd
Sperry Loop
Vought Ave
23

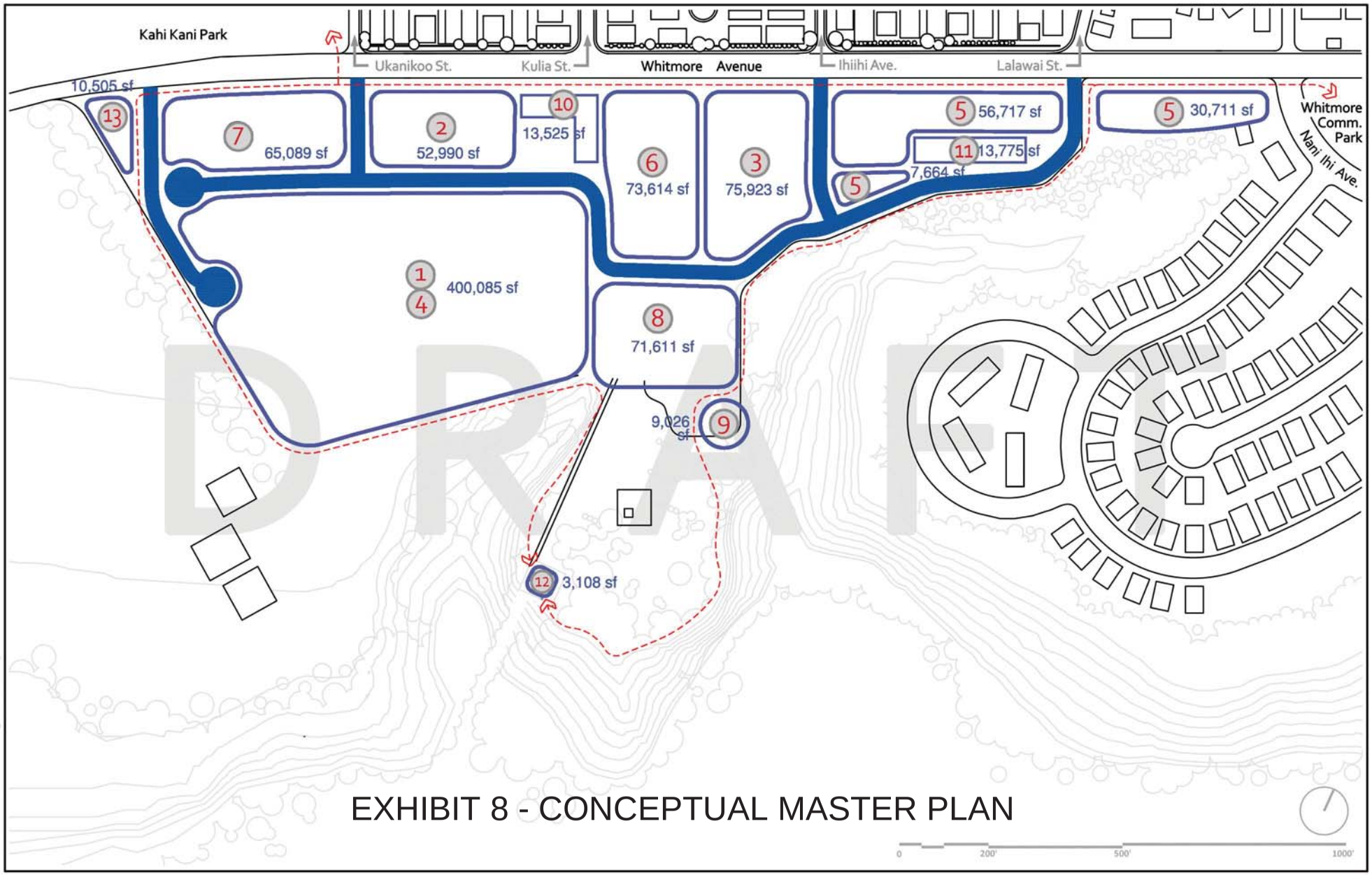


EXHIBIT 8 - CONCEPTUAL MASTER PLAN

Path - Q:\Oahu\Whitmore Project\Photoshop

Whitmore Food Hub Conceptual Master Plan

DRAFT 11/09/2018

1. Food Hub and Warehouse
2. Food Hub Visitor Center
3. Anchor Tenant Food Processing
4. Logistics Yard
5. Research and Innovation Node
6. Tenant Food Producer
7. Farmer's Market / Visitor Parking
8. Workforce Housing / Parking
9. Water Storage Tanks and Treatment Ponds
10. Existing Machine Shop - Renovated
11. Existing Outdoor Shed - Renovated
12. Kaukonahua Stream Overlook
13. Whitmore Food Hub Entry Feature

Whitmore Project

Agribusiness Development Corporation

Island of O'ahu

North

PBR HAWAII & ASSOCIATES, INC.

Source: The University of Arkansas Community Design Center, University of Arkansas Office for Sustainability, University of Arkansas Resiliency Center, 2017. Agribusiness Development Corporation, 2017.
Disclaimer: This Graphic has been prepared for general Planning purposes only and should not be used for boundary Interpretations or other spatial analysis beyond the limitations of the data.



EXHIBIT 9 - EXISTING DRAINAGE CONDITIONS

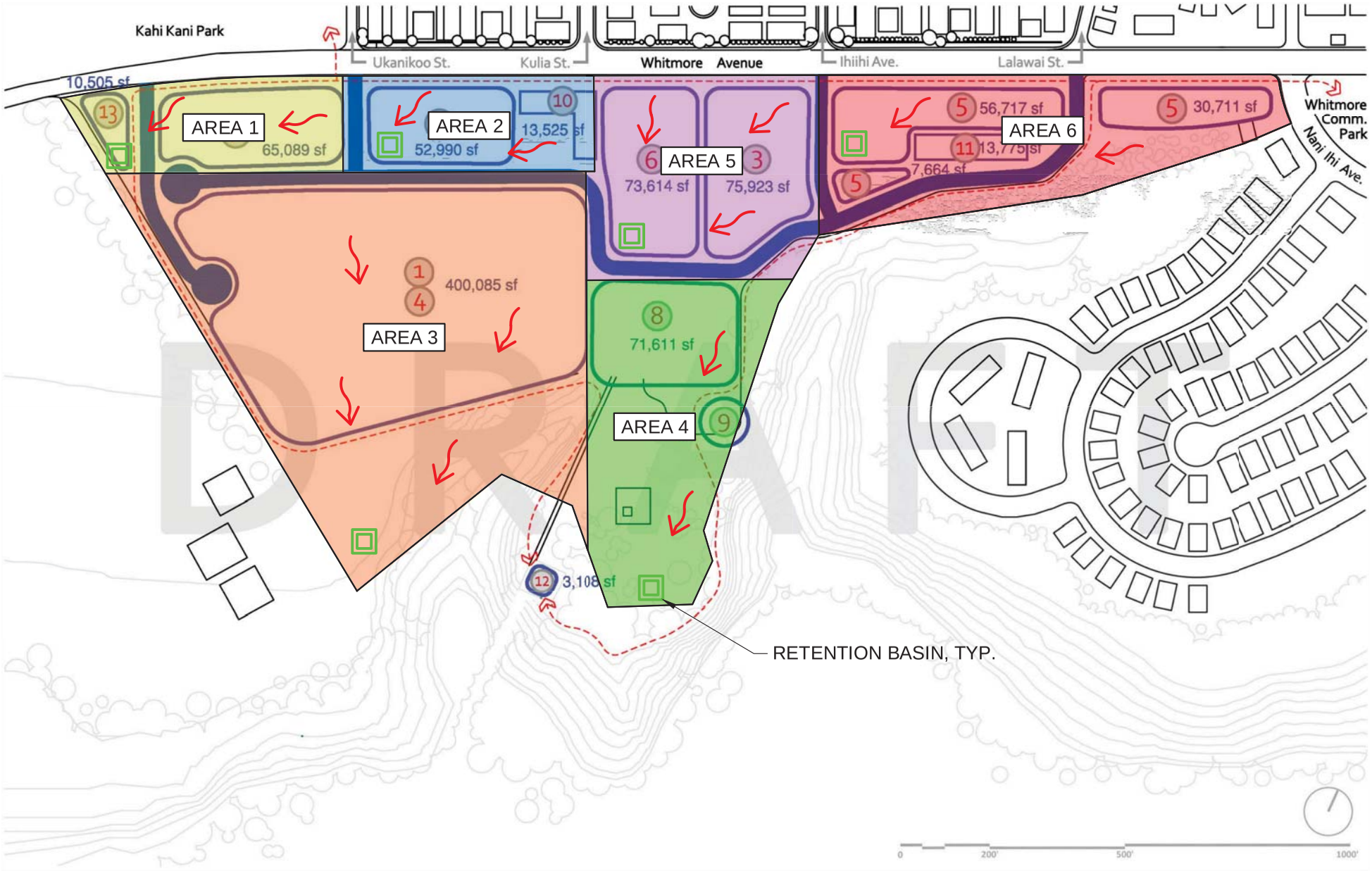


EXHIBIT 10 - PROPOSED DRAINAGE CONDITIONS

DEPARTMENT OF PLANNING AND PERMITTING

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET * HONOLULU, HAWAII 96813

Phone: (808) 768-8209 * Fax: (808) 768-4210

SEWER CONNECTION APPLICATION

APPLICATION NO.: **2018/SCA-1766** STATUS: **Denied**

DATE RECEIVED: **10/12/2018** IWDP APP. NO.:

PROJECT NAME: **2018/SCA-1766 Whitmore Agricultural Project**

LOCATION:

Zone	Section	Plat	Parcel
7	1	002	009

900 WHITMORE AVE Wahiawa 967[illegible] **1,049,448** Sq. Ft.

SPECIFIC LOCATION: **900 Whitmore Avenue**

APPLICANT: **Sam O. Hirota, Inc.**
ATTN. Winston Ing
864 South Beretania
Honolulu, Hawaii 96813

DEVELOPMENT TYPE: **Warehouse**

OTHER USES: **Retail**
General Industry

NON-RESIDENTIAL AREA: s.f.

SEWER CONNECTION WORK DESIRED:

APPROXIMATE DATE OF CONNECTION:

PROPOSED UNITS	EXISTING UNITS	UNITS TO BE DEMOLISHED
No. of New Units: **0**	No. of Existing Units: **0**	No. of Units to be Demolished: **0**
Studios:	Studios:	Studios:
1-Bedroom:	1-Bedroom:	1-Bedroom:
2-Bedroom:	2-Bedroom:	2-Bedroom:
3-Bedroom:	3-Bedroom:	3-Bedroom:
4-Bedroom:	4-Bedroom:	4-Bedroom:
5-Bedroom:	5-Bedroom:	5-Bedroom:
6-Bedroom:	6-Bedroom:	6-Bedroom:

REMARKS **The downstream 15-inch sewers on Whitemore Avenue are inadequate to support the increase in sewage.**

DENIAL DATE: **10/15/2018**

REVIEWED BY: ***Keith Miyashiro***

Site Development Division, Wastewater Branch

ExternalID: **064014900-001** JobId: **64014900**

Initial Print Date: Monday October 15, 2018 1:51 pm

APPENDIX 2 - RUNOFF CALCULATIONS

Whitmore Community Food Hub
Prepared by: Sam O. Hirota Inc.

Date:November 12, 2018

PRE-DEVELOPMENT HYDROLOGY

Area #	Area (sf)	Area (Ac)	C	High Point (ft)	Low Point (ft)	Length (ft)	Slope (ft/ft)	Tc (min)	I (in)	Correction Factor	Total Q (cfs)
1	962,836	**22.104**	0.31	985	935	1500	0.03	40.00	2.75	1.21	**23.10**
2	639,374	**14.678**	0.42	1110	970	1900	0.07	35.00	2.75	1.31	**22.23**
	Total	**36.782**									**45.34**

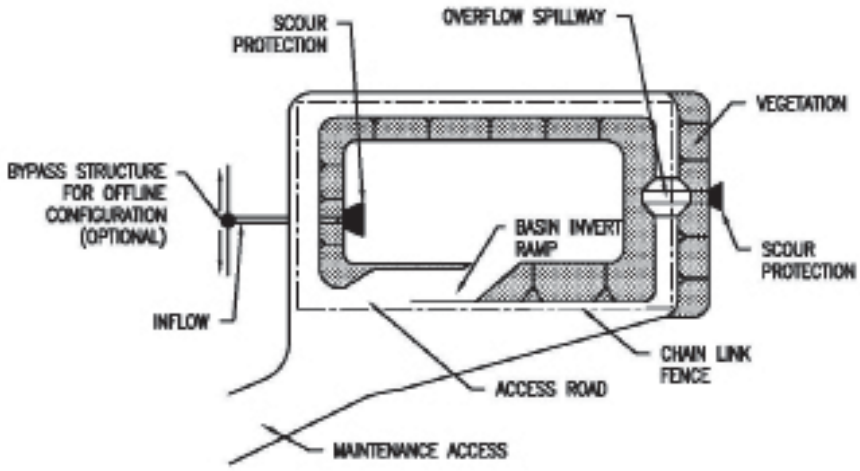
POST-DEVELOPMENT HYDROLOGY

Area #	Area (sf)	Area (Ac)	C	High Point (ft)	Low Point (ft)	Length (ft)	Slope (ft/ft)	Tc (min)	I (in)	Correction Factor	Total Q (cfs)
1	116,851	**2.683**	0.39	980	975	385	0.01	29.00	2.75	1.46	**4.19**
2	117,684	**2.702**	0.39	990.00	980.00	300	0.03	26.25	2.75	1.54	**4.49**
3	644,520	**14.796**	0.69	985.00	935.00	980	0.05	17.75	2.75	1.84	**51.92**
4	233,266	**5.355**	0.30	985.00	970.00	740	0.02	40.00	2.75	1.21	**5.42**
5	224,728	**5.159**	0.43	990.00	985.00	500	0.01	26.25	2.75	1.54	**9.32**
6	265,161	**6.087**	0.31	1010.00	990.00	940	0.02	40.00	2.75	1.21	**6.19**
	Total	**36.782**									**81.53**

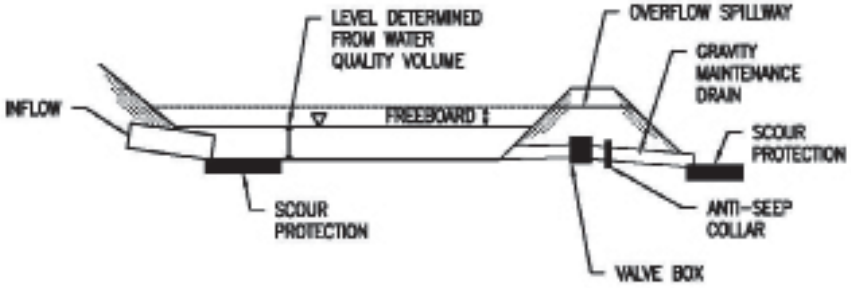
LID Type	WQV (cuft)
Retention Basin	3,000
Retention Basin	3,500
Retention Basin	36,000
Retention Basin	5,500
Retention Basin	6,000
Retention Basin	5,000
Total	59,000

Additional Calculations			
Difference in Flow, Q_{diff}	(Q_{post} - Q_{pre})	36.20	cfs
Total Volume, V_{diff}	Q_{diff} x 3,600 x 0.5	65,153	cf

APPENDIX 3 - RETENTION BASIN SCHEMATIC



PLAN
SCALE: NTS



CROSS-SECTION
SCALE: NTS

Schematic of an Infiltration Basin

APPENDIX G
Assessment Consultation Comment Letters and Responses



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BOARD OF WATER SUPPLY

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

February 4, 2019

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BRYAN P. ANDAYA, Chair
KAPUA SPROAT, Vice Chair
KAY C. MATSUI
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MAX J. SWORD

ROSS S. SASAMURA, Ex-Officio
JADE T. BUTAY, Ex-Officio

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

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer

Ms. Theresa Dean
PBR Hawaii & Associates
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Dean:

Subject: Your Letter Dated September 5, 2018 Requesting Comments on the Environmental Assessment for the Proposed Whitmore Community Food Hub Complex on Whitmore Avenue, Tax Map Key: 7-1-002: 009, Por. 004, 022, and 023

Thank you for the opportunity to comment on the proposed food hub complex.

To aid in our evaluation of the availability of water, the Draft Environmental Assessment (EA) should break down the potable water requirements for the commercial, agricultural, and residential needs of the proposed food hub complex.

The EA should evaluate an on-site well alternative to provide for large process water requirements.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

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

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

THOMAS S. WITTEN, FASLA
Chairman / Principal

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Project Director

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Cultural Sustainability Planner

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Senior Associate

CATIE CULLISON, AICP
Senior Associate

MARC SHIMATSU, ASLA
Senior Associate

DACHENG DONG, LEED® AP
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MICAH McMILLEN, ASLA, LEED® AP
Associate

NATHALIE RAZO
Associate

GRACE ZHENG, ASLA, LEED® GA, SITES® AP
Associate

BRIAN WOLF, ASLA, LEED® AP
Associate

Mr. Ernest Y. W. Lau, P.E., Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, HI 96843

ATTN: Mr. Robert Chun, Project Review Branch

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Lau:

Thank you for your letter dated February 4, 2019 regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge the Board of Water Supply's (BWS) comments and have provided the following responses.

The Draft Environmental Assessment (DEA) will include:

A breakdown of the potable water requirements for the needs of the proposed food complex to aid in your evaluation of the availability of water.

An evaluation of an on-site well alternative to provide for large process or fire flow water requirements.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

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DEPARTMENT OF COMMUNITY SERVICES
CITY AND COUNTY OF HONOLULU

925 DILLINGHAM BOULEVARD, SUITE 200 • HONOLULU, HAWAII 96817
PHONE: (808) 768-7762 • FAX: (808) 768-7792
www.honolulu.gov/dcs

KIRK CALDWELL
MAYOR

PAMELA A. WITTY-OAKLAND
DIRECTOR

REBECCA J.'I. SOON
DEPUTY DIRECTOR

October 4, 2018

Ms. Theresa Dean
PBR Hawaii & Associates
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Ms. Dean:

SUBJECT: Pre-Assessment Consultation for a HRS Chapter 343
Environmental Assessment - Proposed Whitmore Community
Food Hub Complex
Wahiawa, Oahu, Hawaii, TMKs (1) 7-1-002:009, 004 (por.), 022, 023

Thank you for PBR Hawaii's letter dated September 5, 2018, regarding the above matter. As requested, you are seeking the City & County of Honolulu's input on the preparation of the Environmental Assessment, as required by Chapter 343, Hawaii Revised Statutes, on the proposed Whitmore Community Food Hub Complex project.

A review of the documents indicate that the proposed project will have no adverse impacts on any Department of Community Services activities or projects at this time.

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

Sincerely,

Pamela A. Witty-Oakland
Director

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Ms. Pamela A. Witty-Oakland, Director
Department of Community Services
City and County of Honolulu
925 Dillingham Blvd,
Suite 200
Honolulu, HI 96817

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Ms. Witty-Oakland:

Thank you for your letter dated October 4, 2018, regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge the Department of Community Services' (DCS) comment that the proposed project will have no adverse impacts on any DCS activities or projects at this time.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
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Project Director

RAMSAY R. M. TAUM
Cultural Sustainability Planner

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Senior Associate

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MARC SHIMATSU, ASLA
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MICAH McMILLEN, ASLA, LEED® AP
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Associate

GRACE ZHENG, ASLA, LEED® GA, SITES® AP
Associate

BRIAN WOLF, ASLA, LEED® AP
Associate

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

KIRK CALDWELL
MAYOR

ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

September 24, 2018

PBR Hawaii & Associates, Inc.
ATTN: Vincent Shigekuni
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

Dear Mr. Shigekuni,

Subject: Pre-assessment Consultation for a HRS Chapter Environmental Assessment- Prosed Whitmore Community Food Hub Complex, Wahiawa, Oahu, Hawaii, TMKs (1) 7-1-002:009, 004 (por.), 022,023

Thank you for the opportunity to review and comment. The Department of Design and Construction Facilities Division comments that Whitmore Community Park is next to the proposed development and may generate an increase in traffic for the surrounding area. The EA should include a traffic study to assess the impact on Whitmore Avenue and the adjoining areas.

If you have any further questions regarding these comments, Please contact Clifford Lau at 768-8483.

Sincerely,

Robert J. Kroning, P.E.
Director

RJK:ms(743056)

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Mr. Robert J. Kroning, P.E., Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, HI 96813

Attn: Clifford Lau

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Kroning:

Thank you for your letter dated September 24, 2018, regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge the comments by the Department of Design and Construction (DDC) and provide the following response.

We acknowledge your comment that the proposed project may generate an increase in traffic for the surrounding area. A traffic analysis of the potential impact on Whitmore Avenue and adjoining areas will be included in the Draft Environmental Assessment (DEA).

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

THOMAS S. WITTEN, FASLA
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BRIAN WOLF, ASLA, LEED® AP
Associate

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CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
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DIRECTOR

TIMOTHY A. HOUGHTON
DEPUTY DIRECTOR

ROSS S. TANIMOTO, P.E.
DEPUTY DIRECTOR

IN REPLY REFER TO
PRO 18-063

September 14, 2018

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

Dear Ms. Dean:

SUBJECT: Pre-Assessment Consultation for Proposed Whitmore Community Food Hub Complex, Wahiawa, Oahu, Hawaii (TMK 7-1-002:009, 004 (portion), 022, 023)

We reviewed your letter dated September 5, 2018. We have the following comments on the subject document:

1. The project description includes an "onsite wastewater treatment pond". If the project plans to discharge treated effluent and/or solids to City sewer lines, the details of the concentration(s) and discharge quantities and loads should be included in the Environmental Assessment.

2. Commercial projects that require a building permit and have a sewer connection will need to be evaluated for the issuance of an Industrial Wastewater Discharge Permit (IWDP). A copy of the IWDP can be found on the City's Department of Environmental Services website. Complete and return the IWDP application to the Department of Planning and Permitting, Site Development Division, Wastewater Branch, 650 South King Street, 1st floor. The information provided will assist in determining if an IWDP is needed. If required, the form will then be used as an application for the IWDP. Please contact the City Department of Environmental Services, Environmental Quality Division, Regulatory Control at 768-3262 for more information regarding the IWDP.

3. Please consult with the City Department of Planning and Permitting, Site Development Division, Wastewater Branch regarding availability of capacity for any planned connections to City sewer lines.

Should you have other questions regarding our comments, please call Lisa Kimura, Civil Engineer V, at 768-3455.

Sincerely,

Lori M.K. Kahikina, P.E.
Director

cc: DPP, SDD, Wastewater Branch

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

THOMAS S. WITTEN, FASLA
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President / Principal

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Project Director

RAMSAY R. M. TAUM
Cultural Sustainability Planner

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Senior Associate

CATIE CULLISON, AICP
Senior Associate

MARC SHIMATSU, ASLA
Senior Associate

DACHENG DONG, LEED® AP
Senior Associate

MICAH McMILLEN, ASLA, LEED® AP
Associate

NATHALIE RAZO
Associate

GRACE ZHENG, ASLA, LEED® GA, SITES® AP
Associate

BRIAN WOLF, ASLA, LEED® AP
Associate

Ms. Lori M.K. Kahikina, P.E., Director
Department of Environmental Services
City and County of Honolulu
1000 Uluohia Street, Suite 308
Kapolei, HI 96707

Attn: Ms. Lisa Kimura, Civil Engineer V

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Ms. Kahikina:

Thank you for your letter dated September 14, 2018 (your reference number PRO 18-063), regarding the subject project. As the planning consultant for the State of Hawai‘i Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comments and provide the following responses.

1. We acknowledge your comment that if the project plans to discharge treated effluent and/or solids to City sewer lines, the details of the concentration(s) and discharge quantities and loads should be included in the Environmental Assessment. The DEA will include a description of the wastewater treatment plans.

2. The DEA will include a list of the required City and County of Honolulu permits, including whether the project anticipates the need for an Industrial Wastewater Discharge Permit (IWDP).

3. The project will consult with the City Department of Planning and Permitting, Site Development Division, Wastewater Branch regarding the availability of capacity for any planned connections to City sewer lines.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
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DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL
MAYOR

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

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 18-586

October 3, 2018

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

Dear Ms. Dean:

Subject: Pre-Consultation for A HRS, Chapter 343
Environmental Assessment - Proposed Whitmore Community Food Hub Complex, Wahiawa
TMK: (1) 7-1-002:009, 004 (POR.), 022, 023.

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

We have no comments at this time, as we do not have any facilities or easements on the subject property.

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

Sincerely,

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

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
Executive Vice-President / Principal

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Project Director

RAMSAY R. M. TAUM
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Associate

NATHALIE RAZO
Associate

GRACE ZHENG, ASLA, LEED® GA, SITES® AP
Associate

BRIAN WOLF, ASLA, LEED® AP
Associate

Mr. Ross Sasamura, P.E., Director and Chief Engineer
Department of Facility Maintenance
City and County of Honolulu
1000 Ulu‘ohia Street, Suite 215
Kapolei, HI 96707

Attn: Mr. Kyle Oyasato

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Sasamura:

Thank you for your letter dated October 03, 2018 (your reference number DRM 18-586), regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comment that the Department of Facility Maintenance (DFM) has no comment as your Department does not have any facilities or easements on the subject property.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

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DEPARTMENT OF LAND MANAGEMENT
CITY AND COUNTY OF HONOLULU
558 SOUTH KING STREET • HONOLULU, HAWAII 96813
PHONE: (808) 768-4277• FAX: (808) 768-4296 • INTERNET: http://www.honolulu.gov/dlm

KIRK CALDWELL
MAYOR

SANDRA S. PFUND
DIRECTOR

September 12, 2018

Mr. Vincent Shigekuni
Vice-President/Principal
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

SUBJECT: Pre-Assessment Consultation for a HRS Chapter 343 Environmental Assessment – Proposed Whitmore Community Food Hub Complex, Wahiawa, Oahu, Hawaii
TMKs (1) 7-1-002:009, 004 (POR.), 022, 023

Thank you for the opportunity to review and comment at the Pre-Assessment stage of the Environmental Assessment. The Department of Land Management (DLM) currently has no comments as the proposed project will have no impact on any of our programs and facilities. However, DLM would like the opportunity to review and comment on the Draft Environmental Assessment when it becomes available.

If you have any questions, please call Mr. Seiji Ogawa, Project Manager of the Asset Development Division, at 768-4294.

Sincerely,

Sandra S. Pfund
Director

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
Executive Vice-President / Principal

VINCENT SHIGEKUNI
Senior Vice-President / Principal

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KIMI MIKAMI YUEN, LEED® AP BD+C
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Chairman Emeritus

ANN MIKIKO BOUSLOG, PhD
Project Director

RAMSAY R. M. TAUM
Cultural Sustainability Planner

RAYMOND T. HIGA, ASLA
Senior Associate

CATIE CULLISON, AICP
Senior Associate

MARC SHIMATSU, ASLA
Senior Associate

DACHENG DONG, LEED® AP
Senior Associate

MICAH McMILLEN, ASLA, LEED® AP
Associate

NATHALIE RAZO
Associate

GRACE ZHENG, ASLA, LEED® GA, SITES® AP
Associate

BRIAN WOLF, ASLA, LEED® AP
Associate

Ms. Sandra S. Pfund, Director
Department of Land Management
City and County of Honolulu
558 South King Street
Honolulu, HI 96813

Attn: Mr. Seiji Ogawa, Project Manager

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Ms. Pfund:

Thank you for your letter dated September 12, 2018 regarding the subject project. As the planning consultant for the State of Hawaii, Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comment that the Department of Land Management (DLM) has no comments as the proposed project will have no impact on any DLM programs or facilities. As requested, you will have the opportunity to review and comment on the Draft Environmental Assessment (DEA) when it becomes available.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
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DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

September 17, 2018

Mr. Vincent Shigekuni, Vice President/Principal
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

SUBJECT: Pre-Assessment Consultation for a HRS Chapter 343 Environmental Assessment - Proposed Whitmore Community Food HUB Complex Wahiawa, Oahu, Hawaii, TMKs (1) 7-1-002:009, 004 (POR.), 022, 023

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

If it is determined that the 100 unit workforce micro-housing is subject to the requirements of the Park Dedication Ordinance please include in the environmental assessment how the project proposes to meet those requirements.

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

Sincerely,

Michele K. Nekota

Michele K. Nekota
Director

MKN:jr
(743282)

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Michele K. Nekota, Director
Department of Parks and Recreation
City and County of Honolulu
1000 Uluohia Street, Suite 309
Kapolei, HI 96707

Attn: Mr. John Reid, Planner

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Ms. Nekota:

Thank you for your letter dated September 17, 2018, regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comment and offer the following response.

The Draft Environmental Assessment (DEA) will provide an analysis and discussion regarding the applicability of the Park Dedication Ordinance as it relates to the proposed 100 unit workforce micro-housing units.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
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Principal

KIMI MIKAMI YUEN, LEED® AP BD+C
Principal

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Chairman Emeritus

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Project Director

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Cultural Sustainability Planner

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CITY AND COUNTY OF HONOLULU
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KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

October 12, 2018

2018/ELOG-1765(ry)
1645907

PBR Hawaii & Associates, Inc.
Attn: Theresa Dean
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Dean:

SUBJECT: Pre-Assessment for Whitmore Community Food Hub Complex
Wahiawa, Oahu, Tax Map Keys: 7-1-002: 009, 004 (por.), 022, and 023

Thank you for the opportunity to comment on your letter received on September 10, 2018, requesting comments on the subject proposal.

As you are aware that the project is in the State Land Use Agricultural District and zoned AG-1 Restricted agricultural District, we look forward to the Draft Environmental Assessment (DEA) which should provide the following details:

1. Tenant type (e.g., food and beverage, clothing, food and consumables, etc. or their mixes) for any retail space and how products sold will meet Sections 205-2 and 205-4.5, Hawaii Revised Statutes (the State Land Use Law).

2. Tenant type for office space (e.g., finance, property management, security, maintenance, accessory use to the project, etc.) and how these uses meet the State Land Use Law.

3. How the tenants of the housing units will meet the farm dwelling or farm employee housing definitions of the State Land Use Law.

4. A comparison of the project to the policies and guidelines of the current Central Oahu Sustainable Communities Plan (COSCP) and the proposed revised COSCP pursuant to Bill 75 (2017).

5. Describe how the proposed uses may be permitted under Chapter 21, Revised Ordinance of Honolulu (the City's Land Use Ordinance).

6. Describe how the proposed visitors center compares in tenant mix with that of existing visitor centers such as the Dole Plantation Visitors Center.

7. What is the projected number of visitors to the visitors center at start-up, at two years, and at five years after the beginning of operations.

8. What agricultural companies have expressed interest in or are anticipated to utilize the processing facilities at the food hub complex.

Should you have any questions, please contact Raymond Young, of our staff, at 768-8049.

Very truly yours,

Kathy K. Sokugawa
Acting Director

KKS:ah

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Ms. Kathy K. Sokugawa, Acting Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, HI 96813

Attn: Raymond Young

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Ms. Sokugawa:

Thank you for your letter dated October 12, 2018 (your reference number 2018/ELOG-1765(ry) 1645907), regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation (ADC), we acknowledge the comments by the Department of Planning and Permitting (DPP) and as a result, we requested and met with you and your staff on November 9, 2018. At the meeting, ADC Director James Nakatani provided the vision for the proposed Food Hub project (primarily to provide food safety processing services to smaller farmers of former Galbraith Estate lands and other nearby lands), but also noted that both food safety requirements and technology are ever-evolving. As a result of the meeting, we believe the DPP staff present had a better understanding of how the proposed uses may be permitted under Chapter 21, Revised Ordinance of Honolulu, as well as under Chapter 205, Hawaii Revised Statutes.

We value DPP's participation in the environmental review process. Your letter and the information provided by DPP's staff (at the meeting) will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
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DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
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KIRK CALDWELL
MAYOR

WES FRYSZTACKI
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

TP9/18-743562R

October 5, 2018

Mr. Vincent Shigekuni
Vice-President/Principal
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Attention: Ms. Theresa Dean

Dear Mr. Shigekuni:

SUBJECT: Pre-Assessment Consultation Draft Environmental Assessment (DEA) for the Proposed Whitmore Community Food Hub Complex, Wahiawa, Oahu, Hawaii

In response to your letter dated September 5, 2018, we have the following comments:

1. **Transportation Impact Assessment (TIA).**

   a. The 34 acre site with a large post-harvest facility, multiple public spaces, workforce micro-housing, wastewater treatment pond, and water storage infrastructure are likely to attract more people (residents, employees, and visitors) to the site for shopping, recreation, working, and those that live at the micro-housing units. Therefore, a multi-modal TIA should be completed that analyzes the vehicle, pedestrian, bicycle, and public transit stress and comfort levels at the nearby intersections and project access driveways with corresponding improvements to mitigate these impacts by applying Complete Streets principles.

   b. Include a map depicting the various road ownerships of the adjacent roadways.

c. The TIA should identify the locations of all nearby bus stops that residents, employees, and visitors are likely to use.

d. Use person and vehicle trip rates from the Institute of Traffic Engineer's Trip Generation Manual and assign these trips to the transportation system. This will require analysis of crossing treatments using National Cooperative Highway Research Program 562 methodology for pedestrian measures.

e. The calculated and observational Level of Service (LOS) should be provided.

f. Define performance measures for use in the study:

i. V/C ratio targets that are >1 for 1st and/or 2nd highest peak hours;
ii. Identify where vehicle LOS will not be used;
iii. Pedestrian LOS:
iv. Bicycle Level of Traffic Stress
v. Transit Capacity and Quality of Service

2. **Pedestrian and Bicycle Facilities.** A pedestrian and bicycle plan for the facility should be provided that includes internal pedestrian and bicycle sidewalks and paths for the property and how they connect to the external streets and bus stops.

3. **Parking and Service Strategy.**

a. All parking needs for the proposed facility should be handled on-site.

b. The number of parking spaces should be justified and consistent with the trip generation method used in the TIA.

4. **Traffic Management Plan (TMP).** A TMP should be prepared for this project that is jointly reviewed and accepted by the Department of Transportation Services (DTS) and the Department of Planning and Permitting. The TMP shall include the following:

a. A discussion of the traffic impacts that the project may have on any surrounding City roadways and facilities, including short-term impacts during construction and long-term impacts after

construction with corresponding measures to mitigate these impacts by applying Complete Streets principles.

b. Traffic Demand Management strategies to minimize the amount of vehicular trips to the site.

c. Inform residents and employees of the City's vanpool and car share programs to promote alternate modes of transportation.

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

e. Consider providing subsidized transit passes to employees and residents to encourage use of public transit.

f. Coordinate construction schedules with other nearby properties that have planned developments to ensure minimal impacts on City streets.

5. **Complete Streets**. The DEA should contain further discussion of compliance with County and State Complete Streets policies, pursuant to Act 54, Session Laws of Hawaii 2009, HRS §264-20.5 and ROH 12-15. The DEA should elaborate on how it will comply with Complete Streets policies, including specific adherence to the following key Complete Streets principles: safety, Context Sensitive Solutions, accessibility and mobility for all, use and comfort of all users, consistency of design guidelines and standards, energy efficiency, and health and green infrastructure.

6. **Bike and Moped Parking.** On-site bike racks, secure bike storage, and secure moped parking for the residents, employees and visitors should be included and located on the site plan.

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

8. **Driveway Design.** All access driveways to the project site should be designed with the highest pedestrian and bicycle safety measures and constructed to City standards.

9. **Vehicle/Pedestrian Crossing.** Any existing pedestrian, bicycle and vehicle access/crossing shall be maintained with the highest safety measures during construction.

10. **TheHandi-Van Loading and Unloading.** The project should be designed to accommodate TheHandi-Van para-transit vehicles on-site, which require a minimum 31-foot turning radius, a 10-foot, 6-inch height clearance, and the ability to exit the area without reversing onto public roadways.

11. **Priority Guidelines on Sustainability.** In addressing priority guidelines on sustainability through HRS § 226-108, the Project should consider certification by a green building rating system, including but not limited to nationally recognized rating systems such as Leadership in Energy and Environmental Design (LEED), the Living Building Challenge, Green Globes, or another comparable State-approved, nationally recognized, and consensus-based guideline, standard, or system.

    The DTS supports certification such as the LEED for Building Design and Construction Version 4.0 as it mitigates Location and Transportation (LT) impacts including but not limited to: minimizing the environmental harms associated with parking facilities, including automobile dependence, land consumption, and rainwater runoff; reducing pollution by promoting alternatives to conventionally fueled automobiles; increasing access to quality transit; reducing Vehicle Miles Traveled (VMT) through the integration of bicycle facilities; and compact, walkable development that encourages a density and diversity of surrounding uses.

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

13. **Disability and Communication Access Board (DCAB).** Project plans (interior and exterior layouts, vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by DCAB to ensure full compliance with the Americans with Disabilities Act requirements.

We reserve further comment pending review of the DEA.

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

Very truly yours,

Wes Frysztacki
Director

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
Executive Vice-President / Principal

VINCENT SHIGEKUNI
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NATHALIE RAZO
Associate

GRACE ZHENG, ASLA, LEED® GA, SITES® AP
Associate

BRIAN WOLF, ASLA, LEED® AP
Associate

Mr. Wes Frysztacki, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street,
3rd Floor
Honolulu, HI 96813

ATTN: Renee Yamasaki

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Frysztacki:

Thank you for your letter dated October 5, 2018 (your reference number TP9/18-743562R), regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge the Department of Transportation Services' (DTS) comments and have provided the following response.

1. **Transportation Impact Assessment (TIA) –** A TIA is being prepared and will be included in the Draft Environmental Assessment.

2. **Pedestrian and Bicycle Facilities –** The Conceptual Master Plan for the site will show the proposed separated bicycle and pedestrian paths, and how they connect to off-site parks and bus stops along Whitmore Avenue.

3. **Parking and Service Strategy -** We acknowledge your comment that all parking needs for the proposed facility should be handled on-site. We acknowledge that the number of parking spaces should be justified and consistent with the trip generation method used in the TIA.

4. **Traffic Management Plan (TMP) -** We acknowledge your comment that a TMP should be prepared for the project that is jointly reviewed and accepted by the Department of Transportation Services (DTS) and the Department of Planning and Permitting (DPP). The TMP will be submitted to DPP and DTS for review prior to the approval of the Building Permit.

5. **Complete Streets** – As requested, the DEA will include a discussion of compliance with County and State Complete Streets policies, pursuant to Act 54, Session Laws of Hawaii 2009, HRS 264-20.5 and ROH 12-15.

6. **Bike and Moped Parking** – Per DTS' comments, on-site bike racks, secure bike storage, and secure moped parking for the residents, employees and visitors should be included in the development of the project. Detailed site plans are not available at this time.

7. **Public Transit Service Area** - We acknowledge your comment that the project is located in an existing public transit service area. To ensure that the project development does not affect

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public transit services, project plans will be submitted to DTS – Public Transit Division (PTD) for review and approval.

8. **Driveway Design** - We acknowledge your comment that all access driveways to the project site should be designed with the highest pedestrian and bicycle safety measures and constructed to City standards.

9. **Vehicle/ Pedestrian Crossing** - We acknowledge your comment that any existing pedestrian, bicycle and vehicle access crossing shall be maintained with the highest safety measures during construction.

10. **The Handi-Van Loading and Unloading** - We acknowledge your comment that the project should be designed to accommodate The Handi-Van para-transit vehicles on-site, which require a minimum 31-foot turning radius, a 10-foot, 6-inch height clearance, and the ability to exit the area without reversing onto public roadways.

11. **Priority Guidelines on Sustainability -** Per State law, ADC and/or any private partner will build the Proposed Project to achieve the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) "Silver" rating or equivalent.

12. **Neighborhood Impacts** - We acknowledge your comment that the area Neighborhood Board, as well as the area business, emergency personnel, Oahu Transit Services, Inc., etc., should be kept apprised of the details of the proposed project and the impacts that the project may have on the adjoining local street area network. Such outreach will be performed before and during construction.

13. **Disability and Communication Access Board (DCAB) -** We acknowledge your comment that project plans should be reviewed and approved by DCAB to ensure full compliance with the Americans with Disabilities Act requirements. Coordination with DCAB will occur during the design phases of the project.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII



Theresa Dean
Planner

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

September 21, 2018

Mr. Vincent Shigekuni, Vice President
PBR HAWAII and Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Preconsultation for an Environmental Assessment
Whitmore Community Food Hub Complex
Wahiawa, Hawaii
Tax Map Keys: 7-1-002: 009, 004 (Portion), 022, and 023

In response to your letter dated September 5, 2018, regarding the abovementioned subject, the Honolulu Fire Department (HFD) reviewed the submitted information and requires that the following be complied with:

1. Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet from fire department access roads as measured by an approved route around the exterior of the building or facility. (National Fire Protection Association [NFPA] 1; 2012 Edition, Sections 18.2.3.2.2 and 18.2.3.2.2.1.)

   A fire department access road shall extend to within 50 feet of at least one exterior door that can be opened from the outside and that provides access to the interior of the building. (NFPA 1, 2012 Edition, Section 18.2.3.2.1.)

2. A water supply approved by the county, capable of supplying the required fire flow for fire protection, shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet from a water supply on a

fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ [Authority Having Jurisdiction]. (NFPA 1; 2012 Edition, Section 18.3.1, as amended.)

3. The unobstructed width and unobstructed vertical clearance of a fire apparatus access road shall meet county requirements. (NFPA 1; 2012 Edition, Section 18.2.3.4.1.1 and 18.2.3.4.1.2, as amended.)

4. Submit civil drawings to the HFD for review and approval.

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

Sincerely,

Socrates D. Bratakos

SOCRATES D. BRATAKOS
Assistant Chief

SDB/TC:bh

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Mr. Socrates D. Bratakos, Assistant Chief
Honolulu Fire Department
City and County of Honolulu
636 South Street
Honolulu, HI 96813

Attn: Battalion Chief Wayne Masuda

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Bratakos:

Thank you for your letter dated September 21, 2018, regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comments and provide the following response.

The Draft Environmental Assessment (DEA) will:

1. Note that fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet from fire department access roads as measured by an approved route around the exterior of the building or facility. (National Fire Protection Association [NFPA] 1; 2012 Edition, Sections 18.2.3.2.2.1. and 18.2.3.2.2.)

2. Note that a fire department access road shall extend to within 50 feet of at least one exterior door that can be opened from the outside and that provides access to the interior of the building. (NFPA 1, 2012 Edition, Section 18.2.3.2.1)

3. Provide information on the water supply and the capability of supplying the required fire flow for fire protection, the provision of service to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed, or moved into or within the county. The DEA will note when any portion of the facility or building is in excess of 150 feet from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ [Authority Having Jurisdiction]. (NFPA 1; 2012 Edition, Section 18.3.1, as amended.)

4. Note that the unobstructed width and unobstructed vertical clearance of a fire apparatus access road shall meet county requirements. (NFPA 1; 2012 Edition, Section 18.2.3.4.1.1 and 18.2.3.4.1.2, as amended.)

5. Note that preliminary civil drawings which will be provided to the HFD for review and approval.

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
Executive Vice-President / Principal

VINCENT SHIGEKUNI
Senior Vice-President / Principal

GRANT T. MURAKAMI, AICP, LEED® AP BD+C
Vice-President / Principal

TOM SCHNELL, AICP
Principal

KIMI MIKAMI YUEN, LEED® AP BD+C
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ANN MIKIKO BOUSLOG, PhD
Project Director

RAMSAY R. M. TAUM
Cultural Sustainability Planner

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NATHALIE RAZO
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GRACE ZHENG, ASLA, LEED® GA, SITES® AP
Associate

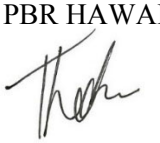
BRIAN WOLF, ASLA, LEED® AP
Associate

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We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII



Theresa Dean
Planner

HOUSE OF REPRESENTATIVES
STATE OF HAWAII
STATE CAPITOL
415 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813

October 11, 2018

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

Dear Ms. Dean,

Thank you for your contacting me in regard to the proposed Whitmore Community Food Hub Complex and its impacts on any existing or proposed projects, plans, policies, or programs within District 46. The proposed Food Hub Complex does not have any impact on any particular "projects, plans, policies, or programs" of which I am aware, but as the proposed complex will substantially impact the community within my District, I would like to include my thoughts about the proposed Food Hub.

The Whitmore project was originally meant to save the Galbraith Land for agriculture and preserve it against purchase by a developer for use as a housing development, such as Mililani. As a former Member of the Wahiawa-Whitmore Village Neighborhood Board, I am concerned that the Agribusiness Development Corporation (ADC) has not informed the community as to what has been happening in Whitmore. The information that has been available has been coming in spurts. Over a year ago, I attended a meeting of ADC at the State Capitol. That was the first time I heard more details about the plan. Efforts to invite the ADC to make a presentation at a meeting of the Neighborhood Board have been unsuccessful.

The following are some points of information and questions that I have that should be considered:

1. COMMUNICATION:

- I initially had a question of when the Whitmore and Wahiawa communities would be able to attend an informational forum/meeting and have the opportunity to ask questions and give input on the design and goal of the project. I recently received an invitation on October 3, 2018, and an e-mail on October 5, 2018, from WEDG and Wahiawa Fresh to attend a community meeting in Whitmore on October 12, 2018, at Helemano Elementary School Cafeteria regarding the proposed Food Hub Complex. It is unclear to me whether the ADC has, in fact, finalized plans for the site and, if so, whether community input can and will be

sincerely considered. If there are changes to the July 2017 Master Plan, will the community be consulted?

2. ROADS AND BRIDGES:

- This is concerning Whitmore Avenue becoming a pedestrian mall. Aside from the residents of Whitmore, there are currently some military facilities in Whitmore. There is an existing traffic problem in the morning and in the late afternoon. I have the following questions: How will the pedestrian mall and streets work for the residents and others? Could there be an increase in pedestrian and car accidents?

- The Master Plan shows parking for customers and tourists. Where will the employees of the processing plant and workforce housing residents park?

- At the last meeting I attended, we were told there will be 40 trucks daily coming in and going out of Whitmore. How will this affect traffic? Is the road suitable for that? Will they be going over Karsten Thot Bridge?

- Will the pedestrian bridge be handicapped friendly? Will there also be a zip line? Who will maintain the bridge and zip line, and who will be responsible should there be an accident on or involving either? Where will the bridge come into Wahiawa? Is there an option for a bridge for both pedestrians and cars? Has there been a survey of residents regarding the bridge?

3. FARMERS:

I have several questions and concerns regarding the farming industry within the area of the proposed Food Hub Complex.

- Have all the leased lands been rented out? Will those who are renting the leased lands be paying a lease rent, water, and other utilities to the State?

- Will the farmers be charged to have their products processed and put in cold storage?

- Will the project also serve as a wholesale warehouse so that restaurants, markets, and other businesses would have to come to Whitmore to get their products? Will the products be transported elsewhere to wholesale warehouses?

- With the project using so much water, what will it do to the water supply for the rest of the community? I have a concern that the project needs to use so much water that it requires its own large water tank. I am also concerned about

possible contamination of the water table by greywater and non-potable water produced or used by the project.

- How noisy will the processing plants be? Will there be noise caused by entertainment and other activities from the tourist mall? How will noise from both of these enterprises affect close neighbors?

4. WORKFORCE HOUSING: BUILDINGS AND OTHER CONCERNS:

- The height of the proposed buildings, including for workforce housing, does not seem compatible with that of existing residential units. Should there be a height limitation of, for example, 3 to 4 stories for the proposed buildings?

- All workforce housing proposed in the current Master Plan is single-occupancy only. If a single person residing in the housing gets a partner, becomes married, or has a child, will they then be required to vacate the housing unit? Is there an assumption that workers will be transient residents and not integrated members of the immediate and neighboring communities of the complex, like Wahiawa, Whitmore, Wailua, Haleiwa, and Mililani? Will there also be temporary or permanent workers from foreign countries?

- Who will manage the workforce units? Will the tenants pay rent and maintenance fees?

- Will the State of Hawaii pay for maintenance of all the common elements, security, utilities, and other costs needed to run and maintain the workforce housing facilities?

Thank you again for contacting me and keeping me apprised of plans for the proposed Whitmore Community Food Hub Complex in Wahiawa. Should you have any further questions, please do not hesitate to contact me.

Sincerely,

Lei R. Learmont
State Representative District 46

cc: Vincent Shigekuni

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
Executive Vice-President / Principal

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Associate

BRIAN WOLF, ASLA, LEED® AP
Associate

The Honorable Lei R. Learmont, State Representative District 46
House of Representatives
State of Hawaii
415 South Beretania Street
Honolulu, HI 96813

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Honorable Ms. Learmont:

Thank you for your letter dated October 11, 2018, regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comments and have provided the following response.

Communication

ADC appreciates your comments and is updating its website as one means to provide the public with greater access to information about the project.

Roads and Bridges

Please be assured that unlike the earlier plans prepared by students of the University of Arkansas, there are currently no plans to convert Whitmore Avenue into a pedestrian mall. Please also note that all parking required for farmers, employees, businesses, researchers and visitors will be accommodated on-site. The Draft Environmental Assessment (DEA) will include a transportation impact study, which will include an estimate of traffic (including trucks) that might be generated by the proposed project.

We acknowledge your questions regarding a pedestrian bridge. Please note that the pedestrian bridge is not part of the current Whitmore Community Food Hub proposed project. Neither are there plans for a zip line.

Farmers

In response to your following question: "Have all the leased lands been rented out?" Please note that, to date, approximately 600 of the 1,207 acres of acquired Galbraith Estate lands have been leased to farmers, however, not all of the leased land is currently productive.

We can report that those who have leased lands are paying lease rent, and are charged for water usage. No other utilities (such as municipal wastewater collection treatment or electricity) are provided to the lessees.

We can also confirm that farmers will be charged to have their products processed and put in cold storage, but obviously, at a lower cost than farmers can build and properly operate individual processing and cold storage facilities.

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The food hub will also serve food wholesalers, who are mostly located in Honolulu. Typically, these businesses make deliveries around the island, and as they head back to their businesses it will be convenient for some delivery routes to include a stop at the Food Hub to pick up produce (for further processing and packaging by individual food wholesalers).

In addition to the above, the DEA will address water demand and the potential impact from operational noise.

Workforce Housing: Buildings and Other Concerns

We acknowledge your questions and want to note that all farmers of former Galbraith Estate lands will require manpower. To address the anticipated workforce demand for affordable housing, ADC anticipates the project site may be able include affordable rental workforce housing. ADC does not intend to build such housing but will likely seek a private developer/operator to do so. County and State regulations that pertain to affordable housing will be observed.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
DIRECTOR
OFFICE OF PLANNING

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

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

DTS 201809270912BE

September 28, 2018

Mr. Vincent Shigekuni
Vice-President / Principal
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Attn.: Theresa Dean

Dear Mr. Shigekuni:

Subject: Pre-Assessment Consultation for a HRS Chapter 343 Draft Environmental Assessment, Proposed Whitmore Community Food Hub Complex Wahiawa, Oahu, Hawaii; TMKs: (1) 7-1-002: 004 (por), 009, 022, and 023

The Office of Planning (OP) appreciates the opportunity to provide comments on the pre-consultation request for the preparation of a Draft Environmental Assessment (Draft EA) for the Whitmore Community Food Hub Complex.

It is our understanding that the proposed Whitmore Food Hub project will be located within the Whitmore Agricultural Tech Park in Whitmore Village, Oahu. The development will have a large post-harvest facility with production and cold storage areas, warehouses, research and incubator space, public spaces, workforce micro-housing, visitor center and retail operations, a wastewater treatment pond, and water storage facilities.

The concept for this project is to pool services for the aggregation, processing, storage, marketing, and distribution of locally produced foods by small growers in Central Oahu. Objectives for this project include creating a facility that meets the requirements of the Food Safety Modernization Act, integrating mixed uses and community space, and connecting the Complex to Whitmore Village and surrounding neighborhoods.

OP has reviewed the transmitted material and has the following comments to offer:

1. Hawaii State Planning Act
   Hawaii Administrative Rules (HAR) § 11-200-10(4) requires Draft and Final Environmental Assessments to provide a general description of the action's technical,

economic, social, and environmental characteristics. The Hawaii State Planning Act, Hawaii Revised Statutes (HRS) Chapter 226, is divided into Part I - Overall Themes, Goals, Objectives, and Policies; Part II - Planning Coordination and Implementation; and Part III - Priority Guidelines. HRS Chapter 226 serves as a guide for long-range development of the State, provides guidance for growth, development, and the allocation of resources throughout the state.

In this regard, the Draft EA should discuss the project and its consistency with State goals and priorities set forth in HRS Chapter 226. This analysis should examine the project's consistency with all three parts of HRS Chapter 226, or clarify where the project conflicts with them. If any of the policy provisions are not applicable to the project, the analysis should affirmatively state such determination, along with an explanation.

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

The proposed action should conform with all of the objectives and supporting policies of the Hawaii CZM program, as listed in HRS § 205A-2. Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall give full consideration to ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As this project will require the approval of a government agency, the Draft EA should contain analysis on the project's consistency with HRS § 205A-2.

3. Drainage / Stormwater Runoff Mitigation / Erosion Control
Pursuant to HAR § 11-200-10(6) – identification and summary of impacts and alternatives considered, in order to ensure that the surface water and marine resources of Oahu remain protected, the effects of potential stormwater runoff caused by the proposed development activities should be evaluated in the Draft EA.

Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, open spaces, the potential vulnerability of surface water resources, drainage infrastructure currently in place, soil absorption characteristics of the area, and examining the amount of permeable versus impervious surfaces in the project area. These items should be considered when developing mitigation measures for the protection for surface water resources and the coastal ecosystem, pursuant to HAR § 11-200-10(7).

Based on the information provided, due to the project's size and the potential increase of impervious surfaces, this proposed action may be subject to the City and County of Honolulu, Department of Planning and Permitting (DPP) rules on drainage and onsite stormwater management. Please contact DPP on the application and necessity of incorporating low impact development (LID) post-construction elements in this project.

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

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

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

4. Conformance with State and County Land Use Designations / Anticipated Entitlements or Permits Required
   While the project appears to advance State objectives for increasing agricultural viability, agricultural diversification, agricultural self-sufficiency, and food security, the proposed mix of uses—particularly the visitors center, retail components, and worker housing—may not conform to the uses permitted of right in the State Agricultural Land Use District and underlying county zoning. As a matter of State land use policy, higher-valued, non-agricultural uses are discouraged in the State Agricultural District to promote the long-term affordability of agricultural land for farmers.

Therefore, the Draft EA should clearly delineate the proposed siting of uses with respect to the underlying State land use district and City and County of Honolulu (City) zoning, the acreage of the area proposed for various uses with respect to the underlying districts, and discuss the conformity of proposed uses to those allowed in the respective underlying districts. We recommend consultation with the City Department of Planning and Permitting regarding any potential use, entitlement, and permitting issues, to ensure that the retail, visitor attractions, and housing elements truly serve agricultural producers over the long-term. The Draft EA list of permits required should reflect any City's concerns or comments in this regard.

5. Other Impacts and Mitigation Measures to be Considered in the Draft EA
We also recommend the Draft EA include discussion and analysis of the following:

- Anticipated level of visitor trips and traffic generated by the proposed visitor center and retail operations, and the potential impacts on surrounding neighborhoods as well as agricultural operations;
- Potential for water reuse within Complex's water and wastewater systems;
- Access to public transportation, goods, and services for occupants of the proposed agricultural worker housing; and
- Discussion of the management systems to be used to ensure viability and sustainability of the Food Hub Complex so that it maintains its agricultural use and serves farmers and agricultural producers over the long-term.

Thank you for the opportunity to provide these comments. If you have any questions regarding this comment letter, please contact Ruby Edwards, (808) 587-2817.

Sincerely,

Leo R. Asuncion
Director

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
Executive Vice-President / Principal

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NATHALIE RAZO
Associate

GRACE ZHENG, ASLA, LEED® GA, SITES® AP
Associate

BRIAN WOLF, ASLA, LEED® AP
Associate

Mr. Leo R. Asuncion, Director
Office of Planning
State of Hawaii
235 South Beretania Street, 6th Floor
Honolulu, HI 96813

Attn: Ms. Ruby Edwards

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Asuncion:

Thank you for your letter dated September 28, 2018 (your reference number DTS 201809270912BE), regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge the comments from the Office of Planning and provide the following responses.

1. We acknowledge your comment that the Draft Environmental Assessment (DEA) should discuss the project and its consistency with State goals and priorities set forth in HRS Chapter 226. An analysis of the project's consistency with HRS Chapter 226 will be included in the forthcoming DEA.
2. We acknowledge your comment that the proposed action should conform to all of the objectives and supporting policies of the Hawaii Coastal Zone Management (CZM) program, as listed in HRS Chapter 205A-2. An analysis of the project's consistency with HRS Chapter 205A-2 will be included in the forthcoming DEA.
3. We acknowledge your comment that, pursuant to HAR 11-200-10(6), the effects of potential stormwater runoff caused by the proposed development activities should be evaluated in the DEA. We appreciate the information provided in your letter on onsite stormwater management strategies which include: Stormwater Impact Assessments, and Low Impact Development (LID), A Practitioners Guide. An analysis of the project's potential impact to surrounding areas as a result of potential stormwater runoff will be included in the forthcoming DEA.
4. As recommended in your letter, an analysis of the project's compliance with all City and County of Honolulu rules and regulations will be included in the forthcoming DEA.
5. We acknowledge that the DEA should include discussion and analysis of the following:
   a. anticipated level of visitor trips and traffic generated by the proposed visitor center and retail operations, and the potential impacts on surrounding neighborhoods as well as agricultural operations;
   b. potential for water reuse within Complex's water and wastewater systems;
   c. access to public transportation, goods, and services for occupants of the proposed agricultural worker housing;
   d. discussion of the management systems to be used to ensure viability and sustainability of the Food Hub Complex so that it maintains its agricultural use and serves farmers and agricultural producers over the long-term.

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We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII



Theresa Dean
Planner

DAVID Y. IGE
GOVERNOR

RODERICK K. BECKER
COMPTROLLER

AUDREY HIDANO
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

(P)1524.8

SEP 25 2018

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

Dear Ms. Dean:

Subject: Pre-Assessment Consultation for a HRS Chapter 343 Environmental Assessment
Proposed Whitmore Community Food Hub Complex
Wahiawa, Oahu, Hawaii
TMK: (1) 7-1-002: 009, 004 (por), 022, and 023

Thank you for the opportunity to provide comments for the subject project. We have no comments to offer at this time as the proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities.

If you have any questions, your staff may call Ms. Gayle Takasaki of the Public Works Division at 586-0584.

Sincerely,

RODERICK K. BECKER
Comptroller

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
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BRIAN WOLF, ASLA, LEED® AP
Associate

Mr. Roderick K. Becker, Comptroller
Department of Accounting and General Services
State of Hawaii
P.O. Box 119
Honolulu, HI 96810-0119

Attn: Ms. Gayle Takasaki

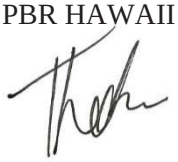
SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Becker:

Thank you for your letter dated September 25, 2018 (your reference number (P) 1524.8), regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comment that the Department of Accounting and General Services (DAGS) has no comments to offer at this time as the proposed project does not impact any of DAGS' projects or existing facilities.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII



Theresa Dean
Planner

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DAVID Y. IGE
Governor

DOUGLAS S. CHIN
Lt. Governor

SCOTT E. ENRIGHT
Chairperson, Board of Agriculture

PHYLLIS SHIMABUKURO-GEISER
Deputy to the Chairperson

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 South King Street
Honolulu, Hawaii 96814-2512
Phone: (808) 973-9600 FAX: (808) 973-9613

October 5, 2018

PBR Hawaii & Associates, Inc.
Attention: Ms. Theresa Dean
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Dean:

Subject: Pre-Assessment Consultation for a Chapter 343 Environmental Assessment
Proposed Whitmore Community Food Hub Complex
Agribusiness Development Corporation
TMK: 7-1-02: 9, por. 4, 22, 23 Wahiawa, Oahu
Area: 34 acres (parcel 9 – 24.092 acres; parcel 22 – 0.767 acres; parcel 23 – 0.287 acre; portion of parcel 4 – 9 acres of 258 acres)

The Department of Agriculture has reviewed the subject description of the proposed project and offers the following comments.

The purpose of the proposed project is to "...pool services for the aggregation, processing, storage, marketing and distribution of locally produced foods by small growers throughout the Oahu central plain."

The Department of Agriculture supports the concept of food hubs to the extent that it offers agricultural operations the opportunity to sell their products at price points that appropriately reflect the demand for locally grown fresh products that will be compliant with both the Food Safety Modernization Act (FSMA) and the voluntary but tougher Good Agricultural Practices (GAP) certification required by certain buyers. Successful establishment and growth of the Whitmore Community Food Hub as envisioned can help to strengthen agricultural production on former sugar and pineapple plantation lands on Oahu.

We recommend the EA address the following issues:

1. Describe the current state of or plans for licensing and establishment of agricultural operations on the Galbraith agricultural lands.

2. When will the Food Hub's agricultural product-related functions be fully operational?

3. Describe how the Food Hub will be managed and what role the agricultural operators will have.

4. Describe the business and management relationships anticipated between agricultural operators and the Food Hub.

5. Explain how the Food Hub concept will help farmers achieve FSMA compliance and implement Good Agricultural Practices.

Should you have any questions, please contact Earl Yamamoto at 973-9466, or by email at earl.j.yamamoto@hawaii.gov.

Sincerely,

Scott E. Enright, Chairperson
Board of Agriculture

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Mr. Scott E. Enright, Chairperson
Department of Agriculture
State of Hawaii
1428 South King Street
Honolulu, HI 96814-2512

Attn: Mr. Earl Yamamoto

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Enright:

Thank you for your letter dated October 05, 2018, regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation (ADC), we acknowledge your comments and provide the following responses.

As ADC is under the Department of Agriculture, we appreciate that the Department of Agriculture supports the concept of food hubs to the extent that it offers agricultural operations the opportunity to sell their products at price points that appropriately reflect the demand for locally grown fresh products that will be compliant with both the Food Safety Modernization Act (FSMA) and the voluntary but tougher Good Agricultural Practices (GAP) certification required by certain buyers. We acknowledge your comment that the successful establishment and growth of the Whitmore Community Food Hub as envisioned can help strengthen agricultural production on former sugar and pineapple plantation lands on Oahu. ADC is planning the proposed the food hub to be supportive of the Galbraith agricultural lands and the establishment of replacement agricultural operations on this land.

When the food hub will be fully operational, how it will be managed, and how the food hub concept will help farmers achieve FSMA compliance and implement Good Agricultural Practices are unknown at this time.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
Executive Vice-President / Principal

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KIMI MIKAMI YUEN, LEED® AP BD+C
Principal

W. FRANK BRANDT, FASLA
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ANN MIKIKO BOUSLOG, PhD
Project Director

RAMSAY R. M. TAUM
Cultural Sustainability Planner

RAYMOND T. HIGA, ASLA
Senior Associate

CATIE CULLISON, AICP
Senior Associate

MARC SHIMATSU, ASLA
Senior Associate

DACHENG DONG, LEED® AP
Senior Associate

MICAH McMILLEN, ASLA, LEED® AP
Associate

NATHALIE RAZO
Associate

GRACE ZHENG, ASLA, LEED® GA, SITES® AP
Associate

BRIAN WOLF, ASLA, LEED® AP
Associate

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

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DAVID Y. IGE
GOVERNOR

ARTHUR J. LOGAN
MAJOR GENERAL
ADJUTANT GENERAL

KENNETH S. HARA
BRIGADIER GENERAL
DEPUTY ADJUTANT GENERAL

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

September 12, 2018

PBR Hawaii & Associates, Inc.
Attn: Theresa Dean
1001 Bishop Street
Honolulu, Hawaii 96813-3484

Dear Ms. Dean:

Subject: Pre-Assessment Consultation for A HRS Chapter 343 Environmental Assessment – Proposed Whitmore Community Food Hub Complex, Wahiawa, O'ahu, Hawai'i, TMKs (1) 7-1-002:009, 004 (POR.), 022, 023.

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

If you have any questions or concerns, please have your staff contact Mr. Wade Ishii, Acting Assistant Chief Engineering Officer at (808) 733-8441.

Sincerely,

NEAL S. MITSUYOSHI
COL, Hawaii National Guard
Chief Engineering Officer

Cc: Mr. David Kennard, Hawaii Emergency Management Agency
Ms. Havinne Okamura, Hawaii Emergency Management Agency

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
Executive Vice-President / Principal

VINCENT SHIGEKUNI
Senior Vice-President / Principal

GRANT T. MURAKAMI, AICP, LEED® AP BD+C
Vice-President / Principal

TOM SCHNELL, AICP
Principal

KIMI MIKAMI YUEN, LEED® AP BD+C
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ANN MIKIKO BOUSLOG, PhD
Project Director

RAMSAY R. M. TAUM
Cultural Sustainability Planner

RAYMOND T. HIGA, ASLA
Senior Associate

CATIE CULLISON, AICP
Senior Associate

MARC SHIMATSU, ASLA
Senior Associate

DACHENG DONG, LEED® AP
Senior Associate

MICAH McMILLEN, ASLA, LEED® AP
Associate

NATHALIE RAZO
Associate

GRACE ZHENG, ASLA, LEED® GA, SITES® AP
Associate

BRIAN WOLF, ASLA, LEED® AP
Associate

First Lt. Shao Yu Lee, Contracting and Engineering Officer
Department of Defense
State of Hawaii
3949 Diamond Head Road
Honolulu, HI 96816-4495

Attn: Mr. Wade Ishii, Acting Assistant Chief Engineering Officer

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear First Lt. Lee:

Thank you for your letter dated September 12, 2018 regarding the subject project. As the planning consultant for the State of Hawaii, Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comment that the Department of Defense (DOD) has no comments to offer relative to the project.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

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DAVID Y. IGE
GOVERNOR

PANKAJ BHANOT
DIRECTOR

CATHY BETTS
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF HUMAN SERVICES
Benefit, Employment and Support Services Division
1010 Richards Street, Suite 512
Honolulu, Hawai'i 96813

September 21, 2018

Re: 18-0498

PBR HAWAII & Associates, Inc.
Attn: Theresa Dean
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Dean:

SUBJECT: Pres-Assessment Consultation For A HRS Chapter 343 Environmental Assessment - Proposed Whitmore Community Food Hub Complex, Wahiawa, Oahu, Hawaii, TMKs (1) 7-1-002:009, 004 (POR.) , 022, 023.

The Department of Human Service (DHS) has reviewed the general plan for the Whitmore Food Hub Complex and has no comment at this time.

If you should have any question regarding this matter, please contact Ms. Lisa Galino, Child Care Program Specialist at (808) 586-5712.

Sincerely,

for Scott Nakasone
Assistant Division Administrator

C: Pankaj Bhanot, Director

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
Executive Vice-President / Principal

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Vice-President / Principal

TOM SCHNELL, AICP
Principal

KIMI MIKAMI YUEN, LEED® AP BD+C
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ANN MIKIKO BOUSLOG, PhD
Project Director

RAMSAY R. M. TAUM
Cultural Sustainability Planner

RAYMOND T. HIGA, ASLA
Senior Associate

CATIE CULLISON, AICP
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MARC SHIMATSU, ASLA
Senior Associate

DACHENG DONG, LEED® AP
Senior Associate

MICAH McMILLEN, ASLA, LEED® AP
Associate

NATHALIE RAZO
Associate

GRACE ZHENG, ASLA, LEED® GA, SITES® AP
Associate

BRIAN WOLF, ASLA, LEED® AP
Associate

Mr. Scott Nakasone, Assistant Division Administrator
Department of Human Services
State of Hawaii
1010 Richards Street, Suite 512
Honolulu, HI 96813

Attn: Ms. Lisa Galino, Child Care Program Specialist

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Nakasone:

Thank you for your letter dated September 21, 2018 (reference number 18-0498), regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comment that the Department of Human Services (DHS) has reviewed the general plan for the Whitmore Food Hub Complex and has no comment at this time.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
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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

October 3, 2018

PBR HAWAII & Associates, Inc.
Attention: Ms. Theresa Dean
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Dean:

SUBJECT: Pre-Assessment Consultation for Proposed **Whitmore Community Food Hub Complex**

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

At this time, enclosed are comments from the (a) Engineering Division, (b) Land Division – Oahu District, (c) Division of Aquatic Resources and (d) Commission on Water Resource Management on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

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September 11, 2018

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LAND DIVISION
2018 SEP 12 PM 1:40
DEPT OF LAND & NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM

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

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for Proposed **Whitmore Community Food Hub Complex**
LOCATION: Wahiawa, Island of Oahu; TMKs: (1) 7-1-002:009, 004 (por.), 022 & 023
APPLICANT: Department of Agriculture, Agribusiness Development Corporation

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments by **October 3, 2018**.

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

( ) We have no objections.
(x) We have no comments.
( ) Comments are attached.

Signed: Darlene Bryant-Takamatsu

Print Name: Darlene Bryant-Takamatsu
Date: 9/12/18

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

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STATE OF HAWAII

September 11, 2018

MEMORANDUM

TO: FROM

DLNR Agencies:
X Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
__Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
__Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: TO
Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for Proposed **Whitmore Community Food Hub Complex**
LOCATION: Wahiawa, Island of Oahu; TMKs: (1) 7-1-002:009, 004 (por.), 022 & 023
APPLICANT: Department of Agriculture, Agribusiness Development Corporation

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments by **October 3, 2018**.

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

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

Signed: _____

Print Name: Carty Chang
Date: 9/17/18

Attachments
cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji

Ref: Pre-Assessment Consultation for Proposed Whitmore Community Food Hub Complex, Wahiawa, Island of Oahu; TMKs: (1) 7-1-002:009, 004 (por.), 022 & 023

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). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR 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 Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).

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) 270-7253.
- Kauai: County of Kauai, Department of Public Works (808) 241-4846.

The applicant should include water demands and infrastructure required to meet project needs. Please note that the projects within State lands requiring water service from their local Department/Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

The applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 9/12/18

DAVID Y. IGE
GOVERNOR OF HAWAII

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

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SEP 12 2018
Division of Aquatic Resources
DAR 5786

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

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September 11, 2018

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LAND DIVISION
2018 SEP 18 AM 10:42
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM

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

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for Proposed **Whitmore Community Food Hub Complex**
LOCATION: Wahiawa, Island of Oahu; TMKs: (1) 7-1-002:009, 004 (por.), 022 & 023
APPLICANT: Department of Agriculture, Agribusiness Development Corporation

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments by **October 3, 2018**.

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

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

Signed: _____

Print Name: Brian J Neilson, Acting DAR Administrator
Date: _____

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

JEFFREY T. PEARSON, P.E.
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 AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

Date: 9/14/18
DAR # 5786

MEMORANDUM

TO: Brian J. Neilson
Acting DAR Administrator

FROM: Ryan Okano, PhD RO, Aquatic Biologist

SUBJECT: Pre-Assessment Consultation for Proposed Whitmore Community Food Hub Complex

Request Submitted by: Russell Tsuji, Land Division Administrator

Location of Project: Whitmore Village, Oahu

Brief Description of Project:

The Whitmore Food Hub Complex is proposed on the parcel currently occupied by the Whitmore Agricultural Tech Park, formerly the Dole Company Operation Facility, in Whitmore Village. The development centers on a large post-harvest facility and will include a number of public spaces, workforce micro-housing, an onsite wastewater treatment pond, and water storage infrastructure. The complex is designed to pool services for the aggregation, processing, storage, marketing and distribution of locally produced foods by small growers throughout the Oahu central plain.

(continued on next page)

Comments:
☐ No Comments ☒ Comments Attached

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

Comments Approved: _____ Date: 9/14/18
Brian J. Neilson
Acting DAR Administrator

DAR# 5786

Comments

The North fork of Kaukonahua Stream is adjacent to the proposed Whitmore Community Food Hub Complex. Due to the presence of this stream the Division of Aquatic Resources (DAR) does have concerns about this project.

Erosion, runoff, and sedimentation can compromise the water quality in streams and ultimately the aquatic resources that inhabit these streams. The North fork of Kaukonahua Stream flows into the state managed Wahiawa Public Fishing Area, a highly utilized body of water that is patronized by freshwater anglers. With that being said poor water quality can also reduce the fishing opportunities within the Wahiawa Public Fishing Area. Due to the threats mentioned above and the implications of these threats, DAR recommends that Best Management Practices (BMPs) be adhered to during the construction and operational phases of this project, in an effort to prevent erosion, runoff, and sedimentation and the synergistic detrimental impacts to water quality and aquatic resources in the North fork of Kaukonahua Stream and Wahiawa Public Fishing Area. BMPs should be detailed in engineering plans and explain how they are reducing events of erosion, runoff, and sedimentation into the adjacent waterways.

Additionally DAR is concerned about the on site wastewater treatment pond. We would like to see efforts and plans the prevent the overflow of the wastewater treatment pond. Similarly to the threats mentioned above wastewater entering the stream environment can compromise water quality and ultimately the aquatic resources that inhabit these streams. Wastewater entering the North fork of Kaukonahua Stream and Wahiawa Public Fishing Area is deemed unacceptable by our agency, thus actions, efforts, and plans that prevent such occurrences is of up most importance.

Within the proposed Draft Environmental Assessment DAR would appreciate a section demonstrating how the threats of erosion, runoff, sedimentation, and wastewater to water quality and aquatic resources are addressed and prevented.

In closing DAR recognizes the benefits that projects such as these, which promote farming and the consumption of locally grown produce, has to the health and well being of Hawaii's people, and the overall global natural environment. Therefore we look forward to the development of the proposed Draft Environmental Assessment, and our role in providing comments throughout this process.

DAVID Y. IGE
GOVERNOR OF HAWAII

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

2018 SEP 12 PM 2:40

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

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HONOLULU, HAWAII 96809

September 11, 2018

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LAND DIVISION
2018 OCT -3 A 11:05
DEPT OF LAND & NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM

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

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for Proposed **Whitmore Community Food Hub Complex**
LOCATION: Wahiawa, Island of Oahu; TMKs: (1) 7-1-002:009, 004 (por.), 022 & 023
APPLICANT: Department of Agriculture, Agribusiness Development Corporation

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments by **October 3, 2018.**

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

( ) We have no objections.
( ) We have no comments.
(x) Comments are attached.

Signed: /s/ Jeffrey T. Pearson, P.E.

Print Name: Deputy Director

Date: September 28, 2018

Attachments
cc: Central Files

FILE ID: RFD-4933.3
DOC ID: 20509

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON

BRUCE S. ANDERSON, PH.D.
WILLIAM D. BALFOUR, JR.
KAMANA BEAMER, PH.D.
MICHAEL G. BUCK
NEIL J. HANNAHS
PAUL J. MEYER

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

September 28, 2018

REF: RFD.4933.3

TO: Mr. Russell Tsuji, Administrator
Land Division

FROM: Jeffrey T. Pearson, P.E., Deputy Director
Commission on Water Resource Management

SUBJECT: Pre-Assessment Consultation for Proposed Whitmore Community Food Hub Complex

FILE NO.: RFD.4933.3
TMK NO.: (1) 7-1-002:009, 004 (por.), 022 & 023

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://dlnr.hawaii.gov/cwrm.

Our comments related to water resources are checked off below.

☐ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☐ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EAP as having high water efficiency can be found at http://www.epa.gov/watersense.

☐ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/

☐ 6. We recommend the use of alternative water sources, wherever practicable.

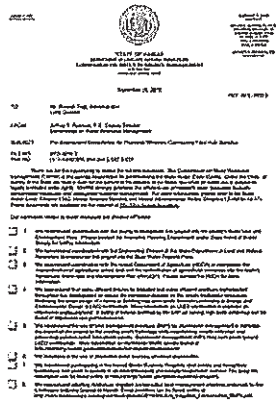
☐ 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at http://energy.hawaii.gov/green-business-program.

☐ 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at http://www.hawaiiscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf.

- [ ] 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.
- [ ] 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.
- [ ] 11. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.
- [ ] 12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.
- [ ] 13. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.
- [ ] 14. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- [X] 15. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.
- [X] 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.
- [X] 17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.
- [ ] 18. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

- [X] OTHER: The DEA should discuss the projected water demands for the project, both potable and non-potable, and provide the calculations used to estimate demands. The DEA should identify the proposed water source(s) to support the project, and include a discussion of the potential impacts on water resources, other public trust uses of water, and describe any proposed mitigation measures. Alternative water sources to meet non-potable water demands should be identified. Water conservation and efficiency measures to be implemented should also be discussed.

If you have any questions, please contact Lenore Ohye of the Planning Branch at 587-0216 or Dean Uyeno of the Stream Protection and Management Branch at 587-0234.



Doc Review RFD.4933.3 Whitmore Community Food Hub Complex

Adobe Sign Document History 10/01/2018

Created:	09/28/2018
By:	Kathy Yoda (kathy.s.yoda@hawaii.gov)
Status:	Signed
Transaction ID:	CBJCHBCAABAAsymsGMXBYQR102XCieO-EAev7Sk3htjn

"Doc Review RFD.4933.3 Whitmore Community Food Hub Complex" History

Document created by Kathy Yoda (kathy.s.yoda@hawaii.gov)
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Signature Date: 10/01/2018 - 9:58:36 AM HST - Time Source: server- IP address: 132.160.239.30

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ETS
STATE OF HAWAI'I

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Mr. Russell Y. Tsuji, Land Administrator
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, HI 96809

Attn: Lydia Morikawa

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Tsuji:

Thank you for your letter dated October 03, 2018, regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comments and provide the following response.

Department of Land and Natural Resources, Land Division
We acknowledge that the Department of Land and Natural Resources, Land Division – Oahu District has no comments.

Department of Land and Natural Resources, Engineering Division
PBR Hawaii acknowledges the Engineering Division's comments that:

1. The project would be subject to the rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), if development falls within a Special Flood Hazard Area (high risk areas);
2. State projects are required to comply with 44CFR regulations as stipulated in Section 60.12;
3. 44CFR reflects the minimum standards and that local community flood ordinances may be more stringent;
4. The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project (According to the Flood Hazard Assessment Report, the project is located in Zone D);
5. That projects within State lands requiring water service from their local Department/ Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage;
6. The applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Project Plan Update projections.

The Draft Environmental Assessment (DEA) will include information on the estimated water demands and infrastructure required to meet the project needs.

Department of Land and Natural Resources, Division of Aquatic Resources
PBR Hawaii acknowledges DAR's comments that:

1. Erosion, runoff, and sedimentation can compromise the water quality in streams and ultimately the aquatic resources that inhabit these streams. The North fork of Kaukonahua Stream flows into the State managed Wahiawa Public Fishing Area, a highly utilized body

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of water that is patronized by freshwater anglers and poor water quality can reduce fishing opportunities within the area, however, the proposed action does not involve any fill or dredging of Kaukonahua Stream;

2. DAR recommends that Best Management Practices (BMPs) be adhered to during the construction and operational phases of this project, in an effort to prevent erosion, runoff, and sedimentation and the synergistic detrimental impacts to water quality and aquatic resources in the North fork of Kaukonahua Stream and Wahiawa Public Fishing Area. This will be stated in the Draft EA.
3. DAR is concerned about the onsite wastewater treatment pond and would like to see efforts and plans that prevent the overflow of the wastewater treatment pond. We acknowledge the comment that wastewater entering the stream environment can compromise water quality and ultimately the aquatic resources that inhabit these streams. The Draft EA will clarify that wastewater treatment pond will only store water from washing of produce that will be processed at the Food Hub.
4. It is acknowledged that wastewater entering the North fork of Kaukonahua Stream and Wahiawa Public Fishing Area is deemed unacceptable by the agency and actions, efforts, and plans that prevent such occurrences is of up most importance.

The DEA will include information on how the threats of erosion, runoff, sedimentation and wastewater will be addressed and prevented.

Department of Land and Natural Resources, Commission on Water Resource Management
PBR Hawaii acknowledges the Commission on Water Resource Management's comments that:

1. The DEA should discuss the projected water demands for the project, both potable and non-potable, and provide the calculations used to estimate demands. The DEA should identify the proposed water source(s) to support the project, and include a discussion of the potential impacts on water resources, other public trust uses of water, and describe any proposed mitigation measures.
2. Alternative water sources to meet non-potable water demands should be identified.
3. Water conservation and efficiency measures to be implemented should be discussed.
4. Since the proposed project does not involve the alteration and/or diversion of Kaukonahua Stream, it is expected that a Stream Channel Alteration Permit, a Stream Diversion Works Permit, or a Petition to Amend the Interim Instream Flow Standard will not be required.

The DEA will include information on the estimated water demand and wastewater generated from the proposed project. The DEA will also include potable and non-potable water sources, any impacts and any proposed mitigation measures.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII



Theresa Dean
Planner

UNIVERSITY of HAWAI'I MĀNOA

Water Resources Research Center

September 11, 2018

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

Theresa Dean:

This is to acknowledge receipt of your letter for review of an Environmental Assessment.

Unfortunately, the Water Resources Research Center does not have the capacity to review the environmental impact statement at this time due to the faculty position vacancy.

While we continue to explore filling the current vacancy, the Center will exclude itself from commentary on this specific environmental assessment study.

Sincerely,

Darren T. Lerner, PhD
Interim Director

2540 Dole Street, Holmes Hall 283
Honolulu, Hawai'i 96822
Telephone: (808) 956-7847
Fax: (808) 956-5044
An Equal Opportunity/Affirmative Action Institution

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Mr. Darren T. Lerner, PhD, Interim Director
Water Resources Research Center
University of Hawai‘i at Mānoa
2540 Dole Street, Holmes Hall 283
Honolulu, HI 96822

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Dr. Lerner:

Thank you for your letter dated September 11, 2018, regarding the subject project. As the planning consultant for the State of Hawai‘i Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comment that the Water Resources Research Center will exclude itself from commentary on this specific environmental assessment.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

THOMAS S. WITTEN, FASLA
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United States Department of the Interior

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

In Reply Refer To:
01EPIF00-2018-TA-0586

September 24, 2018

Ms. Theresa Dean
PBR Hawai‘i & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813-3484

Subject: Technical Assistance for the Pre-Assessment Environmental Assessment for the Proposed Whitmore Community Food Hub Complex, Wahiawa, Island of O‘ahu

Dear Ms. Dean,

Thank you for your recent correspondence requesting technical assistance on species biology, habitat, or life requisite requirements. 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. We provide the following information for your consideration under the authorities of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 *et seq*.), as amended.

Due to significant workload constraints, PIFWO is currently unable to specifically address your information request. The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. Based on your project location and description, we have noted the species most likely to occur within the vicinity of the project area, in the **‘Occurs In or Near Project Area’** column. Please note this list is not comprehensive and should only be used for general guidance. We have added to the PIFWO website, located at https://www.fws.gov/pacificislands/promo.cfm?id=177175840 recommended conservation measures intended to avoid or minimize adverse effects to these federally protected species and best management practices to minimize and avoid sedimentation and erosion impacts to water quality.

If you are representing a federal action agency, please use the official species list on our web-site for your section 7 consultation. You can find out if your project occurs in or near designated critical habitat here: https://ecos.fws.gov/ipac/.

Under section 7 of the ESA, it is the Federal agency’s (or their non-Federal designee) responsibility to make the determination of whether or not the proposed project “may affect” federally listed species or designated critical habitat. A “may affect, not likely to adversely affect” determination is appropriate when effects to federally listed species are expected to be discountable (*i.e*., unlikely to occur), insignificant (minimal in size), or completely beneficial.

This conclusion requires written concurrence from the Service. If a “may affect, likely to adversely affect” determination is made, then the Federal agency must initiate formal consultation with the Service. Projects that are determined to have “no effect” on federally listed species and/or critical habitat do not require additional coordination or consultation.

Implementing the avoidance, minimization, or conservation measures for the species that may occur in your project area will normally enable you to make a “may affect, not likely to adversely affect” determination for your project. If it is determined that the 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 the ESA compliance. If the proposed project is funded, authorized, or permitted by a Federal agency, then that agency should consult with us pursuant to section 7(a)(2) of the ESA. If no Federal agency is involved with the proposed project, the applicant should apply for an incidental take permit under section 10(a)(1)(B) of the ESA. A section 10 permit application must include a habitat conservation plan that identifies the effects of the action on listed species and their habitats, and defines measures to minimize and mitigate those adverse effects.

We appreciate your efforts to conserve endangered species. We regret that we cannot provide you with more specific protected species information for your project site. If you have questions that are not answered by the information on our website, you can contact PIFWO at (808) 792-9400 and ask to speak to the lead biologist for the island where your project is located.

Sincerely,

Island Team Manager
Pacific islands Fish and Wildlife Office

The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. For your guidance, we‘ve marked species that may occur in the vicinity of your project, this list is not comprehensive and should only be used for general guidance.

Scientific Name	**Common Name / Hawaiian Name**	**Federal Status**	**Occurs In or Near Project Area**
Mammals			
Lasiurus cinereus semotus	Hawaiian hoary bat/ ‘ōpe‘ape‘a	E	☒
Reptiles			
Chelonia mydas	Green sea turtle/honu - Central North Pacific DPS	T	☐
Erectmochelys imbricata	Hawksbill sea turtle/ Honu ‘ea	E	☐
Birds			
Anas wyvilliana	Hawaiian duck/ koloa	E	☐
Branta sandvicensis	Hawaiian goose/ nēnē	E	☐
Fulica alai	Hawaiian coot/ ‘alae kea	E	☐
Gallinula galeata sandvicensis	Hawaiian gallinule/ ‘alae ‘ula	E	☐
Himantopus mexicanus knudseni	Hawaiian stilt/ Ae‘o	E	☐
Oceanodroma castro	Band-rumped storm-petrel/ ‘akē‘akē	E	☒
Pterodroma sandwichensis	Hawaiian petrel/ ‘ua‘u	E	☒
Puffinus auricularis newelli	Newell’s shearwater/ ‘a‘o	T	☒
Ardenna pacificus	Wedge-tailed Shearwater/ ‘ua‘u kani	MBTA	☐
Gygis alba	White Tern/ manu-o-kū	MBTA	☐
Buteo solitarius	Hawaiian hawk/ ‘io	E	☐
Insects			
Manduca blackburni	Blackburn’s sphinx moth	E	☐
Megalagrion pacificum	Damselfly, Pacific Hawaiian	E	☐
M. xanthomelas	Damselfly, Orangeblack Hawaiian	E	☐
M. nigrohamatum nigrolineatum	Damselfly, Blackline Hawaiian	E	☐

Plants				
Scientific Name	**Common name**	**Status**	**Locations**	**May Affect**
Abutilon menziesii	Koʻoloaʻula	E	O, L, M, H	☐
Achyranthes splendens var. *rotundata*	ʻEwa hinahina	E	O	☐
Bonamia menziesii	No common name	E	K, O, L, M, H	☐
Canavalia pubescens	ʻĀwikiwiki	E	Ni, K, L, M	☐
Colubrina oppositifolia	Kauila	E	O, M, H	☐
Cyperus trachysanthos	Puʻukaʻa	E	K, O	☐
Gouania hillebrandii	No common name	E	Mo, M	☐
Hibiscus brackenridgei	Maʻo hau hele	E	O, Mo, L, M, H	☐
Ischaemum byrone	Hilo ischaemum	E	K, O, Mo, M, H	☐
Isodendrion pyrifolium	Wahine noho kula	E	O, H	☐
Marsilea villosa	ʻIhiʻihi	E	Ni, O, Mo	☐
Mezoneuron kavaiense	Uhiuhi	E	O, H	☐
Nothocestrum breviflorum	ʻAiea	E	H	☐
Panicum fauriei var. *carteri*	Carter's panicgrass	E	Molokini Islet (O), Mo	☐
Panicum niihauense	Lauʻehu	E	K	☐
Peucedanum sandwicense	Makou	E	K, O, Mo, M	☐
Pleomele (Chrysodracon) hawaiiensis	Halapepe	E	H	☐
Portulaca sclerocarpa	ʻIhi	E	L, H	☐
Portulaca villosa	ʻIhi	E	Le, Ka, Ni, O, Mo, M, L, H, Nihoa	☐
Pritchardia affinis (maideniana)	Loulu	E	H	☐
Pseudognaphalium sandwicensium var. *molokaiense*	ʻEnaʻena	E	Mo, M	☐
Scaevola coriacea	Dwarf naupaka	E	Mo, M	☐
Schenkia (*Centaurium*) *sebaeoides*	ʻĀwiwi	E	K, O, Mo, L, M	☐
Sesbania tomentosa	ʻŌhai	E	Ni, Ka, K, O, Mo, M, L, H, Necker, Nihoa	☐
Tetramolopium rockii	No common name	T	Mo	☐
Vigna o-wahuensis	No common name	E	Mo, M, L, H, Ka	☐

Location key: O=Oʻahu, K=Kauaʻi, M=Maui, H=Hawaiʻi Island, L=Lānaʻi, Mo=Molokaʻi, Ka=Kahoʻolawe, Ni=Niʻihau, Le=Lehua

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Mr. Aaron Nadig, Island Team Manager
Pacific Islands Fish and Wildlife Office
U.S. Fish and Wildlife Service
300 Ala Moana Blvd, Suite 3-122
Honolulu, HI 96850

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Nadig:

Thank you for your letter dated September 24, 2018 (your reference number 01EPIF00-2018-TA-0586), regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comments and provide the following response.

The Draft Environmental Assessment (DEA) will include an analysis and discussion of any protected or endangered species that are most likely to be encountered by the proposed project. The DEA will also discuss all proposed avoidance, minimization or conservation measures for the species that may occur in the proposed project area.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

THOMAS S. WITTEN, FASLA
Chairman / Principal

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Theresa Dean

From: Fukawa, Janice A CIV CNRH, N4A <janice.fukawa@navy.mil>
Sent: Thursday, February 07, 2019 2:37 PM
To: Theresa Dean
Cc: Vincent Shigekuni; Muraoka, John T CIV NAVFAC HI, EV13
Subject: RE: Proposed Whitmore Food Hub

Aloha Theresa,

Thanks for following up with us on this project. Based on the preliminary information you provided, we offer the following suggestions and comments:

- Although you may have already passed this milestone - State of Hawaii should request pre-assessment consultation/early consultation for its EA (per HRS 343 and HAR 11-200) with the Navy via formal correspondence (letter) in order to get coordinated environmental and general planning input.

- Vehicular Traffic Concern - The Navy is preparing a traffic study and assessed the need for signalization at points along Whitmore Road, due to anticipated Navy personnel increases at Wahiawa Annex. Recommend that the cumulative effects of this and other planned projects be assessed.

- Pedestrian Traffic - Increase in the number of pedestrians and pedestrian safety in the vicinity of the project is of concern currently. There have already been reports of impaired visibility of pedestrians crossing near the intersection of Whitmore Avenue and Saipan Road. Per the proposed site plan, pedestrians coming from Whitmore Village will have to cross Whitmore Ave to get to the Food Hub Complex. The draft site plan is a bit unclear, but from a safety standpoint, a more robust connection between the two should be made; rather than just the one painted crosswalk at Ukanikoo St. Additionally, the effect of the un-signalized pedestrian crossing to overall traffic should be investigated.

Our Navy point of contact for review of the DEA is Mr. John Muraoka, cc'd on this e-mail. He can be reached at 471-1171, ext. 210. If you have any questions on these comments, please let me know. Thank you very much!

Very Respectfully,

Janice Fukawa, AICP
Community Planning and Liaison Officer
Navy Region Hawaii Encroachment Management Program
850 Ticonderoga Street, Suite 110
JBPHH, HI 96860
Phone: (808) 473-0729
janice.fukawa@navy.mil

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Ms. Janice Fukawa, AICP
Community Planning and Liaison Officer
Navy Region Hawaii Encroachment Management Program
850 Ticonderoga Street, Suite 110
JBPHH, HI 96860

ATTN: Mr. John Muraoka

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Ms. Fukawa:

Thank you for your email dated February 7, 2019 regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge the Joint Base Pearl Harbor Hickam, Wahiawa Annex's comments and have provided the following response.

We acknowledge your comment that the State of Hawaii should request pre-assessment consultation / early consultation for its EA (per HRS 343 and HAR 11-200) with the Navy via formal correspondence (letter) in order to get coordinated environmental and general planning input. Per our initial formal letter consultation request sent December 28, 2018 and January 15, 2019, the pre-Assessment comment period was allotted without a specific deadline. The request from JBPHH was to allow for time to submit comments on the first week of February and we received your comments at that time. Please note that JBPHH will be notified when the Draft Environmental Assessment (DEA) is published to allow for an additional 30 day comment period on the entirety of the proposed project.

We acknowledge your comment that the Navy is preparing a traffic study and assessed the need for signalization at points along Whitmore Road, due to anticipated Navy personnel increases at Wahiawa Annex. We acknowledge your recommendation that cumulative effects of this and other planned projects be assessed. As a result, on February 12, 2019 via email, we requested a copy of the Navy's traffic study (which we have not yet received).

We acknowledge your comment that increase in the number of pedestrians and pedestrian safety in the vicinity of the project is of concern currently, and we have relayed this and the above comments to our transportation engineering consultant,

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

THOMAS S. WITTEN, FASLA
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Theresa Dean

From: Yonezawa, Dean <Dean.Yonezawa@charter.com>
Sent: Thursday, September 27, 2018 11:28 AM
To: Theresa Dean
Subject: PRE-ASSESSMENT FOR PROPOSED WHITMORE COMMUNITY FOOD HUB COMPLEX *CATV *
Attachments: CATV MAP.pdf

Hi Theresa-

Thank-you for sending information on the project.

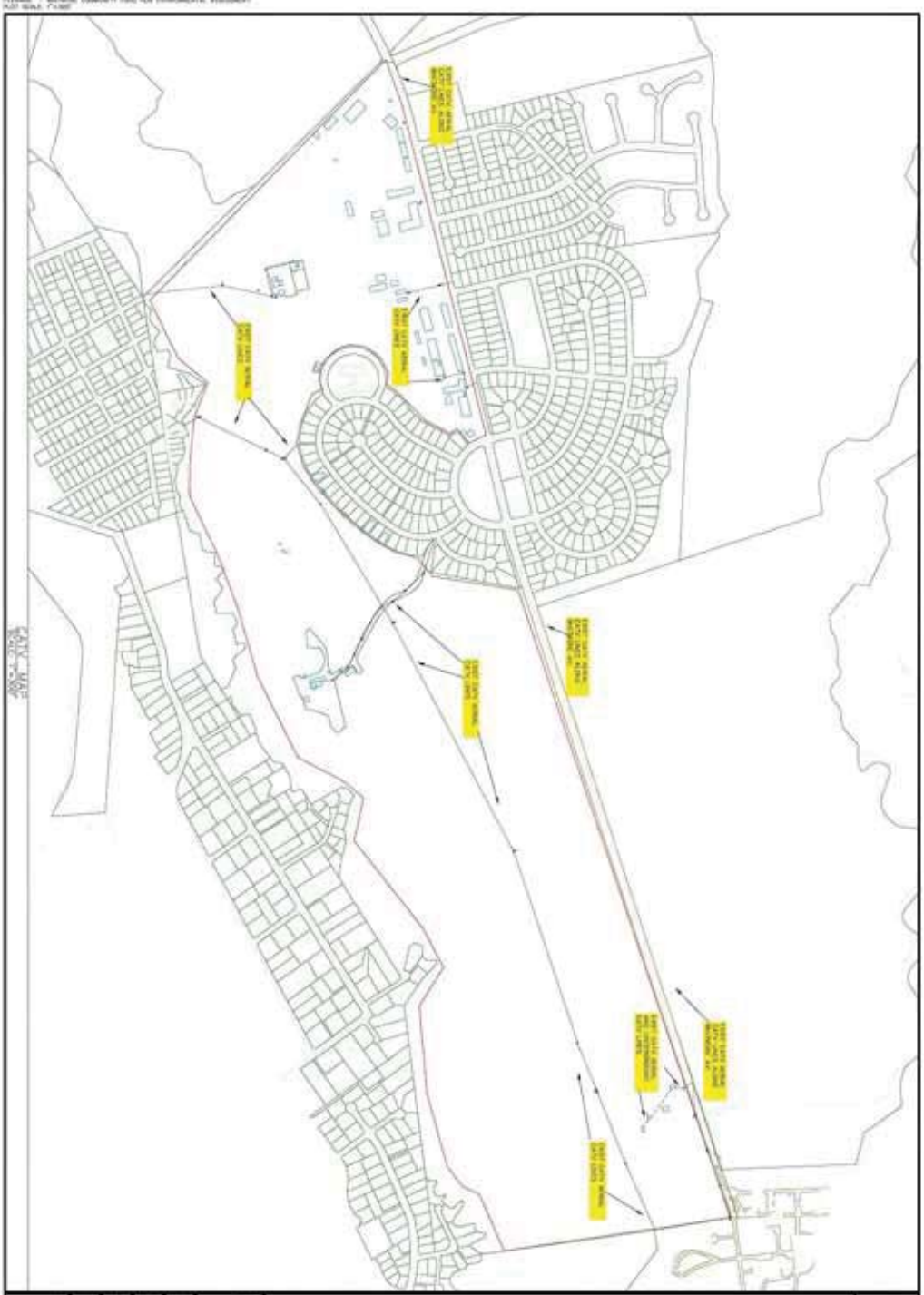
Pls find attached PDF map of the project area. I have indicated where we have existing system near and in the subject area.

Should you have any questions, pls let me know and mention reference# E-36688.

Dean Yonezawa | OSP Engineer| 808.625-8456
200 Akamainui Street | Mililani, Hawaii 96789

Charter
Spectrum

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ENVIRONMENTAL ASSESSMENT

WHITMORE COMMUNITY FOOD HUB COMPLEX

WAHIAWA, OAHU

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Mr. Dean Yonezawa, OSP Engineer
Spectrum
200 Akamainui Street
Mililani, HI 96789

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Yonezawa:

Thank you for your response dated September 27, 2018 (your reference number E-36688), regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge your comments and provide the following response.

The Draft Environmental Assessment (DEA) will include an analysis and discussion regarding any impacts the proposed project may have on the existing Spectrum system.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII



Theresa Dean
Planner

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Chairman / Principal

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BRIAN WOLF, ASLA, LEED® AP
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WAHIAWĀ-WHITMORE VILLAGE NEIGHBORHOOD BOARD NO. 26

NEIGHBORHOOD COMMISSION • 925 DILLINGHAM BOULEVARD, SUITE 160 • HONOLULU, HAWAII, 96817
PHONE (808) 768-3710 • FAX (808) 768-3711 • INTERNET http://www.honolulu.gov/nco

October 18, 2018

PBR Hawaii & Associates, Inc.
ATTN: Ms. Theresa Dean
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

SUBJECT: Pre-Assessment for the Whitmore Community Food Hub Complex
Wahiawa, Oahu (TMK 7-1-002; 009; 004 (por.), 002, and 023

Dear Ms. Dean:

Thank you for allowing the Wahiawa-Whitmore Village Neighborhood Board No. 26 (NB26) an extension of up to October 19, 2018, to comment on the Pre-Assessment for the Whitmore Community Food Hub Complex. This extension is greatly appreciated as our NB26 meeting was held on Monday, October 15, 2018, and the extension allowed our Board and the community to engage in a lively discussion on the subject proposal.

There were about 100 people in attendance at Monday night's meeting; it is important to note the main concerns of the Whitmore Village community is PBR Hawaii's (PBR) perceived lack of communication, outreach, and transparency about this proposal. The questions repeated over and over, were "why weren't we told about this; was there a community meeting on this; who said we wanted this in our community; and why are they asking you (NB26) to comment but not us (community) to comment?" There is also a stronger sense of distrust of the Agribusiness Development Corporation (ADC) as well.

From the NB26's point of view, it was difficult to discuss this subject with only the location map and the Whitmore Community Food Hub complex diagram to review, and no one to have a discussion with. It did not cast PBR in a favorable light, and your clients, the Department of Agriculture and/or the Agribusiness Development Corporation, should remedy this lack of "transparency" immediately. Frankly, it was inadequate and not in the spirit of public comment under HRS 343. Furthermore, at the NB26's Monday night meeting, many questions asked to the ADC representative(s) were left unanswered, or were responded to with vague responses such as, "this is just a concept" or "nothing has been finalized yet." These vague or meaningless answers only raises further questions and undermines any credibility of the ADC and its genuine interest in the immediately affected communities (Whitmore Village, Poamoho, Wahiawa, etc.).

Consequently, the NB26 was forced into a difficult position, and voted unanimously to not support this proposal of a Whitmore Community Food Hub Complex due to ADC's lack of information, transparency, and communication with the Whitmore community residents.

Here are some of the comments and concerns expressed by community members about the proposed Whitmore Community Food Hub Complex Plan:

1. Food Hub Retail and Visitor Center: Who determined that Whitmore Village should become a tourist destination? How many people/visitors are anticipated to stop by?

2. What is the expected traffic, pedestrian and visitor volume, and the impact to this village?

3. What is the reason a for a "shared street" concept along Whitmore Avenue?
(Residents: Dangerous for our seniors and kids who are always walking on this road.)

4. Why is there a proposal for a bridge between Whitmore and Wahiawa?
(Residents: What a waste of money! Will there be security guards because otherwise, it'll just be another hangout for individuals, strangers, illegal activity, etc.)

5. Have our neighbors, the U.S. Navy and the U. S. Marines component located at NCTAMS in Whitmore, been notified about this possible project?
(Residents: Traffic is already bad, and this Whitmore Food Hub proposal will only make it worse.)

6. What kind of impact will this proposed Whitmore Food Hub Retail and Visitor Center have on our neighboring Dole Plantation operation?

7. How does this proposed plan fit in with the policies and guidelines of the Central O`ahu Sustainable Communities Plan?

8. Who or what type of businesses are being sought? What type of work opportunity will there be for residents? Good, paying jobs or retail like food and beverage businesses?
(Residents: What about food safety and DOH requirements (food traps, fry oils, soapy water, etc.? How will this waste product be handled and disposed of?)

9. Who will be using the processing facilities at the Food Hub? Open to anyone? What safety measures will be in place for them to succeed? What kind of impact would this have on our neighboring Kunia Village which also has a packing plant?

10. This facility is located near residential neighborhoods; what kind of research would be performed at the facility? What kind of chemicals will be on site and what safety measures will be in place? Will there be security around the existing facilities?

11. What kind of machinery will be on site, what will the noise level, smells, and wastewater or other bio impacts be and how will these issues be addressed for the safety of the community? What about the environmental concerns regarding fuel, motor oils, rags, etc. What safety measures will be taken?

12. What kind of office spaces will be offered, and to who?

13. Does visitor parking mean tour busses and vans stopping on their way to the North Shore?
(Residents: Too much noise, traffic, we don't want to be like Haleiwa, too many cars and people walking along Kamehameha Highway.)

14. Who will work in the fields? Are you building housing for the workers? Why don't you build housing for people already here?
(Residents: Look around, we are older, retired residents. We cannot work, would like better elderly housing.)

15. How large will the water storage tanks be, and what will the security measures be to ensure no unexpected flooding. Will the current water and sewage infrastructure be able to manage this project?

16. Overall, the residents wanted assurances the DRAFT Environmental Assessment (EA) process will follow procedures, that there will not be any "short-cuts" and that the DRAFT EA will be shared with the community for them to comment on, with the FINAL EA incorporating the public's comments and the responses to those comments.

The overwhelming concerns were about increased traffic (both vehicle and pedestrians), forcing this quiet Whitmore Village to become a new "destination stop" with tour busses and vans. Other issues focused on public health and safety concerns regarding the current water and sewage infrastructure, status of water supply, and the influx of machinery and waste water processing, cooking/food eateries, industrial noise factors (refrigeration, compressors, and pumps.), 24/7 lighting, security, and who will be working in the fields? This all boils down to one thing...CHANGE, BUT FOR WHO? What happens to the lifestyle of these long-time Whitmore Village residents?

Mahalo again, for extending the opportunity to provide comments on the subject of the Pre-Assessment for Whitmore Community Food Hub Complex Wahiawa, Oahu (TMK 7-1-002; 009; 004 (por.), 002, and 023.

We look forward to receiving the DRAFT Environmental Assessment (DEA) and participating in the public comment and hearing period pursuant to HRS 343. Please let me know if NB26 may be of any assistance in making meeting room arrangements for these meetings. I imagine these will be well attended by attentive and interested community members.

Sincerely,

Jeanne C. Ishikawa
Chair, WWV NB26

cc: Senator Donovan Dela Cruz
Representative Lei Learmont
James Nakatani, Executive Director, ADC
Board of Directors, ADC
Members, WWV NB26
Neighborhood Commission Office

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Ms. Jeanne C. Ishikawa, Chair
Neighborhood Board No. 26
City and County of Honolulu
415 South Beretania Street
Honolulu, HI 96813

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Ms. Ishikawa:

Thank you for your letter dated October 18, 2018, regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation (ADC), we acknowledge your comments and have provided the following response.

We acknowledge the comments that the main concern of the Whitmore Village community is the perceived lack of communication, outreach, and transparency about the proposed project. The Draft Environmental Assessment (DEA) will include a detailed description of prior community outreach events and the results from those engagement efforts. Please note that the community is invited and highly encouraged to participate in the DEA comment period to provide input on the proposed project.

We acknowledge the comments that the overwhelming concerns from the neighborhood board meeting were about increased traffic, forcing the quiet Whitmore Village to become a new 'destination stop' with tour busses and vans, public health and safety regarding the current water and sewage infrastructure, status of water supply and the influx of machinery and waste water processing, cooking/ food eateries, industrial noise factors, lighting, security, and farm workers.

We acknowledge that the NB26 voted unanimously to not support this proposal of a Whitmore Community Food Hub Complex due to the perceived lack of information, transparency, and communication with the Whitmore community residents.

The community comments and concerns attached to your letter are addressed in the DEA

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

THOMAS S. WITTEN, FASLA
Chairman / Principal

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President / Principal

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WAHIAWA

Community Based Development Organization (WCBDO)

PO Box 861191, Wahiawa HI 96786 info@wahiawaCBDO.org

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October 24, 2018

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

Ms. Dean,

Wahiawa Fresh! is a grassroots community organization that works to improve the economic outlook of historic Wahiawa town. Our board is made up of residents, business owners, and service providers. Our group serves within the Wahiawa NRSA (Neighborhood Revitalization Strategy Area) which includes Wahiawa town, Whitmore Village, parts of Schofield Barracks, and the surrounding agricultural lands. Wahiawa Fresh! advocates for sensible economic development projects in the area and therefore stands in support of the projected Whitmore Project.

We recognize the project's potential as a major economic driver for our community, and we believe the project will bring job opportunities, career development, tourism and infra-structure/community design improvements, while preserving the historic agricultural nature of the area. Without doubt, the Whitmore Project will be a driving factor that will allow our residents to better live and work in Wahiawa.

In addition, the Whitmore project represents the state's strong commitment to food sustainability. The food hub concept will attract farmers to the area by providing shared supports and infrastructure to make processing, packing and selling cost effective and efficient.

As you continue your assessment, we would only urge that any design and development reflect what the community has for years supported--the historic plantation nature and culture that makes our community unique. We would refer you to the Wahiawa Urban Design Plan as a good starting point.

Thank you for your consideration of our feedback and we look forward to hearing the results of the assessment.

Sincerely,

Darin Uesugi,
Board President
Wahiawa Community Based
Development Organization

PBR HAWAII
& ASSOCIATES, INC.

March 12, 2019

Mr. Darin Uesugi, Board President
Wahiawa Community Based Development Organization
Wahiawa Fresh!
P.O. Box 861191
Wahiawa, HI 96786

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT – WHITMORE COMMUNITY FOOD HUB COMPLEX, WAHIAWA, OAHU, HAWAII TMKS (1) 7-1-002:009, 004 (POR), 022, 023

Dear Mr. Uesugi:

Thank you for your letter dated October 24, 2018 regarding the subject project. As the planning consultant for the State of Hawaii Department of Agriculture, Agribusiness Development Corporation, we acknowledge the Wahiawa Community Based Development Organization's (WCBDO) comments and have provided the following response.

We acknowledge the comments that the WCBDO advocates for sensible economic development projects in the Wahiawa area and therefore stands in support of the Whitmore Project. We also appreciate that the organization recognizes the project's potential as a major economic driver for the Wahiawa community and that the project represents the State's strong commitment to food sustainability.

We recognize the WCBDO's request to reflect the historic plantation culture of Wahiawa when planning for the design and development of the Whitmore Project. The Draft Environmental Assessment (DEA) will discuss how the proposed project intends to reflect the plantation-era aesthetic as detailed in the Wahiawa Urban Design Plan.

We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft EA.

Sincerely,
PBR HAWAII

Theresa Dean
Planner

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