



UNIVERSITY  
of HAWAII  
SYSTEM

FILE COPY  
MAR 23 2021

Jan S. Gouveia  
Vice President for Administration

March 15, 2021

Keith Kawaoka, Acting Director  
State of Hawai'i, Department of Health  
Office of Environmental Quality Control  
235 South Beretania Street, Room 702  
Honolulu, Hawai'i 96813

Subject: Final Environmental Assessment and Findings of No Significant Impact (FEA-FONSI) for the Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus  
Tax Map Keys (TMK): (1) 2-8-023:009  
Honolulu, O'ahu, Hawai'i

Dear Mr. Kawaoka:

The University of Hawai'i (UH) herewith transmits the subject Final Environmental Assessment for a Finding of No Significant Impact (FEA-FONSI). The FEA-FONSI has been prepared pursuant to Chapter 343, Hawai'i Revised Statutes and Chapter 11-200.1, Hawai'i Administrative Rules (HAR).

In the Draft Environmental Assessment (DEA), the Proposed Action was named "Mixed-Use Affordable Housing Project at the University of Hawai'i at Mānoa Campus." However, the Proposed Action has subsequently been renamed "Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus." This change was implemented in order to better reflect the Project and avoid confusion regarding the term "affordable." While the primary purpose of the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty, the rental units are not for the general public nor will they be income restricted.

Attached as appendices to the FEA-FONSI are graduate student and faculty housing data; a flora and fauna survey; an archaeological review and field inspection report; reconnaissance level architectural surveys; a traffic impact report; a cultural impact assessment; and copies of the comments received during the pre-assessment consultation and public comment period for the DEA with the corresponding responses regarding the subject project.

We respectfully request the publication of this FEA-FONSI in the upcoming issue of OEQC's *The Environmental Notice*. Please contact our consultant Mr. Allen Kam, Belt Collins Hawai'i, at (808) 521-5361 if you have any questions.

Sincerely,

Jan Gouveia  
Vice President for Administration  
University of Hawai'i

cc: Ethen Thacher, Greystar Development Services, LLC  
Allen Kam, Belt Collins Hawai'i

21-134

**From:** [webmaster@hawaii.gov](mailto:webmaster@hawaii.gov)  
**To:** [HI Office of Environmental Quality Control](#)  
**Subject:** New online submission for The Environmental Notice  
**Date:** Tuesday, March 16, 2021 9:26:25 AM

---

**Action Name**

Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus --FEA (FONSI)

**Type of Document/Determination**

Final environmental assessment and finding of no significant impact (FEA-FONSI)

**HRS §343-5(a) Trigger(s)**

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

**Judicial district**

Honolulu, O'ahu

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

(1) 2-8-023:009

**Action type**

Agency

**Other required permits and approvals**

See document

**Proposing/determining agency**

University of Hawai'i at Mānoa

**Agency contact name**

Jan Gouveia

**Agency contact email (for info about the action)**

[jgouveia@hawaii.edu](mailto:jgouveia@hawaii.edu)

**Email address or URL for receiving comments**

[jgouveia@hawaii.edu](mailto:jgouveia@hawaii.edu)

**Agency contact phone**

(808) 956-6405

**Agency address**

2444 Dole Street  
Bachman 109H  
Honolulu, HI 96822  
United States  
[Map It](#)

**Was this submittal prepared by a consultant?**

Yes



**Consultant**

Belt Collins Hawaii

**Consultant contact name**

Allen Kam

**Consultant contact email**

[akam@bchdesign.com](mailto:akam@bchdesign.com)

**Consultant contact phone**

(808) 521-5361

**Consultant address**

2153 North King Street  
Suite 200  
Honolulu, HI 96819  
United States  
[Map It](#)

**Action summary**

The proposing agency is submitting the FEA (FONSI) for the proposed action. The University of Hawai'i at Mānoa has partnered with Greystar Development Services, LLC to design, build, finance, operate and maintain a multi-family mixed-use rental housing project for graduate students and faculty on its campus. The Proposed Action will demolish three existing structures at the Project Site and construct a new building that includes 2 adjoining towers connected by a 2-story podium ranging from 12 to 18 stories in height. The project will be comprised of up to 400 individual housing units, placed within with a mix of studios, one-, two- and three-bedroom apartment units. The first 2 floors of the housing complex will be dedicated to childcare center, retail and circulation. The name of the Proposed Action has been revised to avoid confusion regarding the term "affordable", as the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty.

**Reasons supporting determination**

A FONSI determination is determined for the Proposed Action. No short- or long-term significant impacts have been anticipated, and therefore, an Environmental Impact Statement (EIS) would not be required. Please refer to Section 7 "Findings and Determinations" for additional details on the thirteen significance criteria pursuant to HAR §11-200.1-13.

**Attached documents (signed agency letter & EA/EIS)**

- [Vol-2-of-2-UHM-FEA.pdf](#)
- [Vol-1-of-2-UHM-FEA.pdf](#)
- [UHM-Cover-Letter-for-OEQC-revised-3.15.2021.pdf](#)

**Shapefile**

- The location map for this Final EA is the same as the location map for the associated Draft EA.

**Action location map**

- [Project\\_Location.zip](#)

**Authorized individual**

Allen Kam

**Authorization**

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



UNIVERSITY of HAWAI'I®

and

GREYSTAR™

The Global Leader in Rental Housing

Mixed-Use ~~Affordable~~ Housing Project  
at the University of Hawai'i at Mānoa Campus



FINAL ENVIRONMENTAL ASSESSMENT

December 2020 March 2021

*(This page intentionally left blank)*



## TABLE OF CONTENTS

Summary .....	12
1 Introduction.....	17
1.1 Background.....	17
1.2 Project Location.....	17
1.3 Project Description.....	22
1.4 Purpose and Need.....	26
1.5 Land Tenure .....	26
1.6 Development Schedule .....	29
1.7 Estimated Cost.....	29
2 Description of the Existing Environment, Impacts and Mitigation.....	31
2.1 Existing Land Use.....	31
2.2 Regional Setting.....	31
2.3 Physiography .....	39
2.3.1 Geology.....	39
2.3.2 Topography.....	39
2.3.3 Soils.....	39
2.3.3.1 Impacts and Mitigation .....	43
2.4 Hydrology.....	43
2.4.1 Rainfall .....	43
2.4.2 Groundwater.....	43
2.4.2.1 Impacts and Mitigation .....	44
2.4.3 Surface Water.....	44
2.4.3.1 Impacts and Mitigation .....	44
2.4.4 Coastal Water .....	48
2.4.4.1 Impacts and Mitigation .....	48
2.5 Natural Hazards.....	48
2.5.1 Climate Change .....	48
2.5.1.1 Impacts and Mitigation .....	50
2.5.2 Flood.....	50

2.5.2.1 Impacts and Mitigation ..... 53

2.5.3 Tsunami ..... 53

2.5.3.1 Impacts and Mitigation ..... 53

2.5.4 Hurricane ..... 53

2.5.4.1 Impacts and Mitigation ..... 53

2.5.5 Earthquake ..... 53

2.5.5.1 Impacts and Mitigation ..... 55

2.6 Hazardous Materials..... 55

2.6.1 Building Hazards..... 55

2.6.1.1 Asbestos..... 55

2.6.1.2 Lead ..... 56

2.6.1.3 Arsenic..... 57

2.6.1.4 Chemicals ..... 57

2.6.1.5 Impacts and Mitigation ..... 57

2.6.2 Soil Hazards..... 58

2.6.2.1 Impacts and Mitigation ..... 58

2.7 Natural Environment..... 58

2.7.1 Flora ..... 58

2.7.1.1 Impacts and Mitigation ..... 59

2.7.2 Fauna..... 60

2.7.2.1 Impacts and Mitigation ..... 60

2.8 Air Quality..... 61

2.8.1.1 Impacts and Mitigation ..... 62

2.9 Acoustic Environment..... 62

2.9.1.1 Impacts and Mitigation ..... 62

2.10 Scenic Resources ..... 63

2.10.1.1 Impacts and Mitigation ..... 63

3 Historic, Archaeological and Cultural Resources..... 71

3.1 Historic Properties ..... 71

3.1.1.1 Impacts and Mitigation ..... 71

---

3.2	Cultural Resources .....	71
3.2.1	Impacts and Mitigation .....	73
3.3	Archaeological Resources.....	73
3.3.1	Impacts and Mitigation .....	79
4	Public Resources.....	81
4.1	Emergency Services .....	81
4.1.1	Honolulu Fire Department .....	81
4.1.1.1	Impacts and Mitigation .....	81
4.1.2	Honolulu Police Department .....	81
4.1.2.1	Impacts and Mitigation .....	81
4.1.3	University Department of Public Safety .....	82
4.1.3.1	Impacts and Mitigation .....	82
4.1.4	University Health Services.....	82
4.1.4.1	Impacts and Mitigation .....	83
4.1.5	Honolulu Emergency Services Department.....	83
4.1.5.1	Impacts and Mitigation .....	83
4.2	Public Facilities .....	83
4.2.1	Education .....	83
4.2.1.1	Impacts and Mitigation .....	84
4.2.2	Recreation.....	84
4.2.2.1	Impacts and Mitigation .....	85
4.3	Infrastructure and Utilities.....	85
4.3.1	Water .....	85
4.3.1.1	Impacts and Mitigation .....	85
4.3.2	Wastewater .....	88
4.3.2.1	Impacts and Mitigation .....	88
4.3.3	Drainage.....	88
4.3.3.1	Impacts and Mitigation .....	90
4.3.4	Solid Waste.....	90
4.3.4.1	Impacts and Mitigation .....	90

---

4.3.5 Power and Communications..... 90

    4.3.5.1 Impacts and Mitigation ..... 90

4.4 Transportation and Circulation ..... 91

    4.4.1 Traffic..... 91

        4.4.1.1 Impacts and Mitigation ..... 93

    4.4.2 Access and Circulation..... 94

        4.4.2.1 Impacts and Mitigation ..... 95

    4.4.3 Parking Facilities ..... 95

        4.4.3.1 Impacts and Mitigation ..... 96

    4.4.4 Transit Facilities..... 96

        4.4.4.1 Impacts and Mitigation ..... 96

    4.4.5 Bicycle Facilities..... 100

        4.4.5.1 Impacts and Mitigation ..... 100

    4.4.6 Pedestrian Connectivity..... 100

        4.4.6.1 Impacts and Mitigation ..... 100

5 Relationship to Land Use Plans, Policies and Controls ..... 105

    5.1 State of Hawai‘i ..... 105

        5.1.1 Hawai‘i State Plan..... 105

        5.1.2 Hawai‘i State Functional Plan..... 130

        5.1.3 State Land Use Law..... 132

        5.1.4 Hawai‘i Coastal Zone Management Plan..... 133

        5.1.5 Long Range Development Plan..... 139

    5.2 City and County of Honolulu ..... 140

        5.2.1 O‘ahu General Plan..... 140

        5.2.2 Primary Urban Center Development Plan ..... 159

        5.2.3 Land Use Ordinance..... 166

        5.2.4 Plan Review Use ..... 166

    5.3 Permits and Approvals ..... 166

6 Alternatives Considered ..... 169

    6.1 No Action Alternative..... 169



6.2 Alternative Project Site..... 169

6.3 Alternative Project Design ..... 169

6.4 Excluding the Childcare Facility ..... 170

7 Findings and Determinations..... 171

7.1 Determination of FONSI..... 171

7.2 Findings and Reasons Supporting Determination..... 171

8 References ..... 175

## LIST OF FIGURES

Figure 1-1: Location Map .....	18
Figure 1-2: Tax Map Key.....	19
Figure 1-3: Campus Location Map .....	21
Figure 1-4: Project Site.....	21
Figure 1-5: Conceptual Design Renderings.....	23
Figure 1-6: Proposed Site Plan .....	25
Figure 1-7: Zoning Map.....	27
Figure 1-8: State Land Use Map .....	28
Figure 2-1: Existing Land Use .....	32
Figure 2-2: Topography Map.....	41
Figure 2-3: Soil Map .....	42
Figure 2-4: Map of Ala Wai Watershed .....	46
Figure 2-5: Inland Water Classification Map .....	47
Figure 2-6: Water Quality Classification Map .....	49
Figure 2-7: Sea Level Rise Exposure Map .....	51
Figure 2-8: Revised Flood Insurance Rate Map.....	52
Figure 2-9: Tsunami Hazard Map.....	54
Figure 2-10: Key Observation Point (Dole Street x St Louis Drive).....	65
Figure 2-11: Key Observation Points (Dole Street x Mānoa Stream) .....	66
Figure 2-12: Key Observation Points (Dole Street x University Avenue) .....	67
Figure 2-13: Key Observation Points (Dole Street x East-West Road) .....	68
Figure 2-14: Key Observation Points (Alphonse Place x Wa‘ahila Ridge) .....	69
Figure 3-1: Previous Archaeological Studies Map.....	76
Figure 3-2: Historic Properties Map .....	77
Figure 3-3: Field Inspection Photo Map .....	78
Figure 4-1: Map of Nearby Facilities and Services .....	86
Figure 4-2: Civil Utilities Assessment Map.....	87
Figure 4-3: Civil Utilities Assessment Photos .....	89
Figure 4-4: Existing Roadway System .....	92

Figure 4-5: Parking Facilities ..... 98  
Figure 4-6: Transit Facilities ..... 99  
Figure 4-7: Bicycle Facilities ..... 102  
Figure 4-8: Revised Pedestrian Connectivity ..... 103

## LIST OF TABLES

Table 2-1: Summary of Asbestos Sample Collection Results..... 55  
Table 2-2: Summary of Lead Sample Collection Results ..... 56  
Table 2-3: Summary of Arsenic Sample Collection Results..... 57  
Table 2-4: Summary of Soil Sample Collection Results..... 58  
Table 3-1: Summary of Previous Archaeological Studies ..... 74  
Table 4-1: Summary of Traffic Impact Analysis..... 93  
Table 5-1: Consistency with Hawai'i State Plan ..... 105  
Table 5-2: Consistency with Hawai'i State Plan Part III ..... 127  
Table 5-3: Consistency with Hawai'i State Functional Plans..... 130  
Table 5-4: Consistency with the Hawai'i Coastal Zone Management Program ..... 134  
Table 5-5: Consistency with O'ahu General Plan ..... 141  
Table 5-6: Consistency with Primary Urban Center Development Plan ..... 159  
Table 5-7: Permits and Approvals..... 167

## LIST OF APPENDICES

Appendix A: Graduate Student and Faculty Housing Data  
Appendix B: Flora and Fauna Survey  
Appendix C: Archaeological Literature Review and Field Inspection Report  
Appendix D: Reconnaissance Level Surveys  
Appendix E: Traffic Impact Report  
Appendix F: Pre-Consultation Letters and Responses  
Appendix G: Draft EA Letters and Responses

Appendix G- Appendix H: UH 2007 LRDP Cultural Impact Assessment

## ACRONYMS AND ABBREVIATIONS

AAS	Atomic Absorption Spectrophotometry
ACM	Asbestos Containing Materials
amsl	above mean sea level
AQI	Air Quality Index
<b>ALRFI</b>	<b>Archaeological Literature Report and Field Inspection</b>
AsCM	Arsenic Containing Materials
BDPS	Building Design and Performance Standards
BMP	Best Management Practice
BWS	Board of Water Supply
CFR	Code of Federal Regulations
<b>CHS</b>	<b>Cultural Surveys Hawai'i</b>
<b>CIA</b>	<b>Cultural Impact Assessment</b>
City	City and County of Honolulu
Cl	chlorine
COPC	Contaminants of Potential Concern
CWA	Clean Water Act
CZM	Coastal Zone Management
DAR	Department of Land and Natural Resources, Division of Aquatic Resources
DOH	Department of Health
EALs	Environmental Actional Levels
EHE	Environmental Hazard Evaluation
EHMP	Environmental Hazard Management Plan
EPA	Environmental Protection Agency
F	Fahrenheit
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
ft	feet
HAR	Hawai'i Administrative Rules
HECO	Hawaiian Electric Company
HED	High Energy Discharge
HID	High-Intensity Discharge
HIOSH	Hawai'i Occupational Safety and Health
HRS	Hawai'i Revised Statutes



HUD	Housing and Urban Development
IBC	International Building Code
ICP	Inductively Coupled Plasma
in	inches
KOP	Key Observation Point
LBP	lead-based paint
LEED	Leadership in Energy and Environmental Design
LRDP	Long Range Development Plan
m	meter
MBTA	Migratory Bird Treaty Act
mg/kg	milligrams per kilograms
mg/l	milligrams per liter
MIA	Makiki stony clay loam
mm	millimeters
mph	miles per hour
NAAQS	National Ambient Air Quality Standards
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
P3	Private-public partnership
PCBs	Polychlorinated biphenyls
PLM	Polarized Light Microscopy
PRU	Plan Review Use
PUC DP	Primary Urban Center Development Plan
rRk	Rock land
SCS	Soil Conservation Service
sf	square feet
SLR-XA	sea level rise exposure area
State	State of Hawai'i
TOD	Transit-Oriented Development
TDMP	Transportation Demand Management Plan
UBC	Uniform Building Code
UHM	University of Hawai'i at Mānoa
USDA	United States Department of Agriculture

## SUMMARY

PROPOSING AGENCY:	University of Hawai'i
APPROVING AGENCY:	University of Hawai'i
RECORDED FEE OWNER:	University of Hawai'i
DEVELOPER:	Greystar Development Services, LLC
LOCATION:	Mānoa Valley, Waikīkī Ahupua'a, Honolulu, Island of O'ahu
TAX MAP KEY:	(1) 2-8-023:009
PROJECT SUMMARY:	<p>The University of Hawai'i at Mānoa (UHM) has partnered with Greystar Development Services, LLC to design, build, finance, operate and maintain a multi-family mixed-use rental housing project on its campus. The primary purpose of the proposed action is to provide below-market rate housing units to UHM graduate students and junior faculty.</p> <p>The Proposed Action will demolish three existing structures at the Project Site and construct a new building that includes two adjoining towers connected by a two-story podium ranging from twelve to eighteen stories in height. The project will be comprised of up to 400 individual housing units, placed within a mix of studios, one-, two- and three-bedroom apartment units.</p> <p>The first two floors of the housing complex will be dedicated to childcare center, retail and circulation. The proposed childcare facility will replace the existing "UH Mānoa Children's Center," located at <b>2320 Dole Street</b> <del>2600 Campus Road</del> which currently serves over 100 children of UHM students and employees between the ages of two and five years old.</p>
PROJECT SITE:	<p>The proposed building will be constructed on buildable area of the 2.21-acre site of the former National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) located on the UHM Campus at 2570 Dole Street. The Project Site is bound by Dole Street to the South, Mānoa Stream to the East, Burns Hall to the West and the East-West Center to the North.</p>

EXISTING USE:	The Project Site is currently used by UHM for temporary parking, storage and surge space.
CITY AND COUNTY ZONING:	R-5: Residential
STATE LAND USE DISTRICT:	Urban
PERMITS AND APPROVALS:	<p>A Minor Modification Permit to UHM’s Plan Review Use (PRU) Permit No. 2009/PRU-3 (Resolution No. 09-341, CD1, FD1) will be required based on consultation with the City &amp; County of Honolulu Department of Planning and Permitting (DPP).</p> <p>Because the Project Site is owned by UHM, which is a State of Hawai‘i entity, compliance with Chapter 343, Hawai‘i Revised Statutes (HRS) is required. <i>See</i> HRS §343-5(a)(1).</p>
CONSISTENCY WITH LAND USE PLANS AND POLICIES:	<p><b><u>City and County of Honolulu</u></b>                  O‘ahu General Plan                  Primary Urban Center Development Plan                  Land Use Ordinance                  Plan Review Use</p> <p><b><u>State of Hawai‘i</u></b>                  Hawai‘i State Plan State Functional Plans                  State Land Use Law                  State Coastal Zone Management (CZM)                  Long Range Development Plan</p>
ANTICIPATED DETERMINATION:	Finding of No Significant Impact (FONSI)
<u>PRELIMINARY CONSULTATION PARTIES</u> <u>CONSULTED:</u>	<p><b><u>Federal Agencies</u></b>                  U.S. Army Corps of Engineers                  U.S. Fish and Wildlife Services</p> <p><b><u>State Agencies</u></b>                  Department of Land and Natural Resources                  Engineering Division                  Land Division                  Division of Aquatic Resources  <u>Division of Forestry and Wildlife</u>                  Division of Water Resource Management                  Division of Boat and Ocean Recreation</p>

	<p><b><u>Hawai'i State Aha Moku</u></b> Historic Preservation Division O'ahu Island Burial Council Office of Conservation and Coastal Lands Department of Health Environmental Health Administration Clean Water Branch Environmental Management Division Department of Education Department of Business, Economic Development and Tourism Office of Hawaiian Affairs <b><u>Ka Papa Lo'i 'O Kānewai</u></b></p> <p><b><u>State Legislative Branch</u></b> Senator Brian Taniguchi—Senate District 11 <b><u>Representative Dale Kobayashi—House District 23</u></b> Representative Della Au Belatti—House District 24</p> <p><b><u>City &amp; County Agencies</u></b> Honolulu Fire Department Honolulu Police Department Board of Water Supply Department of Transportation Services Department of Environmental Services Department of Parks and Recreation Department of Facility Maintenance Department of Planning and Permitting Department of Design and Construction <b><u>Honolulu Authority for Rapid Transportation</u></b> Mānoa Neighborhood Board No. 7 McCully/ Mō'ili'ili Neighborhood Board No. 8 Diamond Head/ Kapahulu/ St. Louis Heights Neighborhood Board No. 5</p> <p><b><u>City Council</u></b> Council Member Ann Kobayashi</p> <p><b><u>Community Groups</u></b> Ala Wai Watershed Association <b><u>Mālama Mānoa</u></b> <b><u>Mānoa Outdoor Circle</u></b></p>
--	---



**Other Organizations**

Hawaiian Electric Company, Inc.

**Hawaiian Regional Council of Carpenters**

'Iolani School

**Pacific Resource Partnership**

**Other Interested Parties**

2121 Ala Wai

411 Kaiolu Inc.

Ala Wai Cove

Ala Wai Plaza

Ala Wai Skyrise

Aloha Towers

AOAO The Twin Towers Inc.

Ariali Realty Inc.

Au, Robert D.M. & Au, Audrey M.

Chen, Francis & Edna Trust

Four Paddle

Gayer, Donna L. & Gayer, John J.D.

Hale Moani

Kaimana Lanais

**Kaiolu Sunrise**

Kapi'olani Gardens

Kapiolani Real Estate LLC

La Casa

Lanikea at Waikiki

N T P Lynn's Investment Corp.

Pacific Living Trust

Ramos, Juan I.

Rosalei Ltd.

The Promenade

WBL Inc.

Wheeler, Family Trust

*(This page intentionally left blank)*

# 1 INTRODUCTION

## 1.1 BACKGROUND

The University of Hawai‘i at Mānoa (UHM) is an R1: Research University, internationally recognized as one of the nation’s leading land-, sea- and space-grant institutions, offering undergraduate, graduate and professional degrees. UHM is renowned for its unique, multicultural educational experience in a Hawaiian place of learning, with a long history of adherence to the principles of sustainability and the essence of aloha. The 305+ acre campus is located in Mānoa Valley on the island of O‘ahu and currently serves over 12,600 undergraduate students and 4,800 graduate students (MIRO, 2019). The campus currently offers seven dorm-style residence halls, one graduate and multi-family apartment complex and three faculty apartment/condominium complexes (*see* Appendix A). The new housing facility is identified as one of several projects in the UHM Long Range Development Plan (LRDP) Update intended to support UHM’s goal of providing a “live-work-play” environment that fosters inclusivity and connectivity for campus community members.

The latest update to the LRPD was completed in 2007 and the Plan Review Use (PRU) permit for the LRDP was approved by the Honolulu City Council in 2010. The PRU identified eighteen campus projects. A number of these projects have not yet been or were only partially completed, as UHM has shifted their focus primarily to address deferred maintenance and renovation projects to modernize their existing physical plant. By repurposing and renovating their current facilities the UHM has been able to maximize the use of existing space and work well within the projected square footage set forth within their PRU.

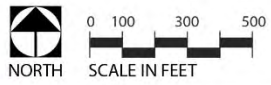
## 1.2 PROJECT LOCATION

UHM’s campus is located in lower Mānoa Valley, approximately one mile north of the Waikīkī and Ala Moana neighborhoods and three miles east and inland of Downtown Honolulu (*see* Figure 1-1: Location Map). The proposed building will be constructed on buildable area of the 2.21-acre site of the former National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) which is located at 2570 Dole Street [TMK: (1) 2-8-023:009] at the southeast boundary of UHM’s “Upper Campus” (the “Project Site”) (*see* Figure 1-2). The 2.21-acre parcel is bounded by Dole Street to the south, the Mānoa Stream to the east, Burns Hall building to the west and Hawaiian Electric Company (HECO) “Substation M” to the north (*see* Figure 1-3). The existing structures on the Project Site include two single-story buildings (approximately 3,500 and 8,400 sf) in the northern section of the parcel and one two-story building (19,920 sf) on the southern boundary of the property (WCIT, 2017; Mason, 2020; DPP, 2020). (*see* Figure 1-4).



Figure 1-1: Location Map

©2020 Belt Collins Hawaii LLC P:/2020.70.0200/001.ai A 10Mar2021 5

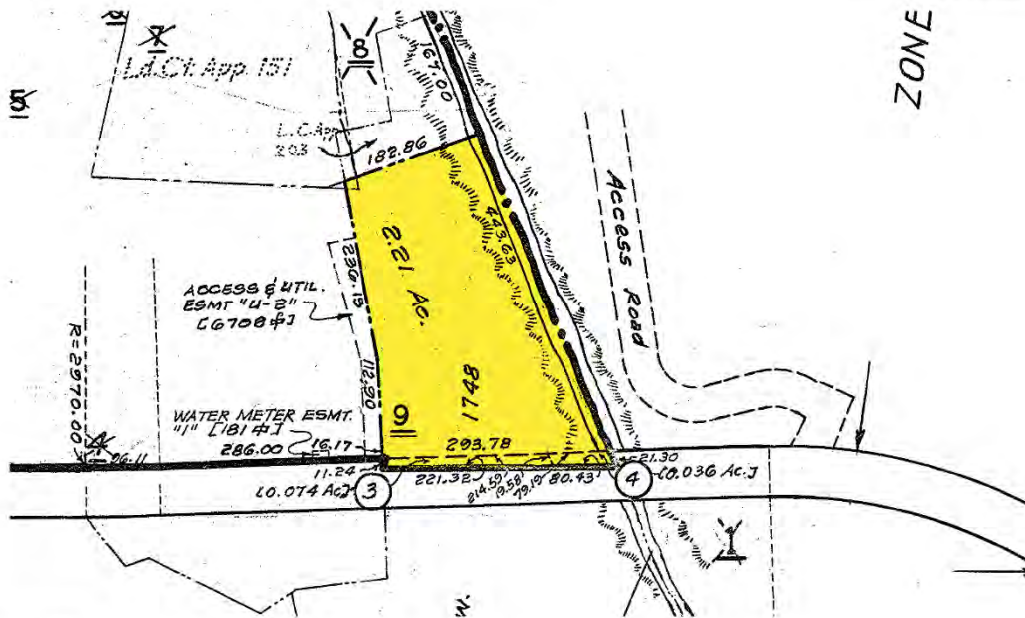
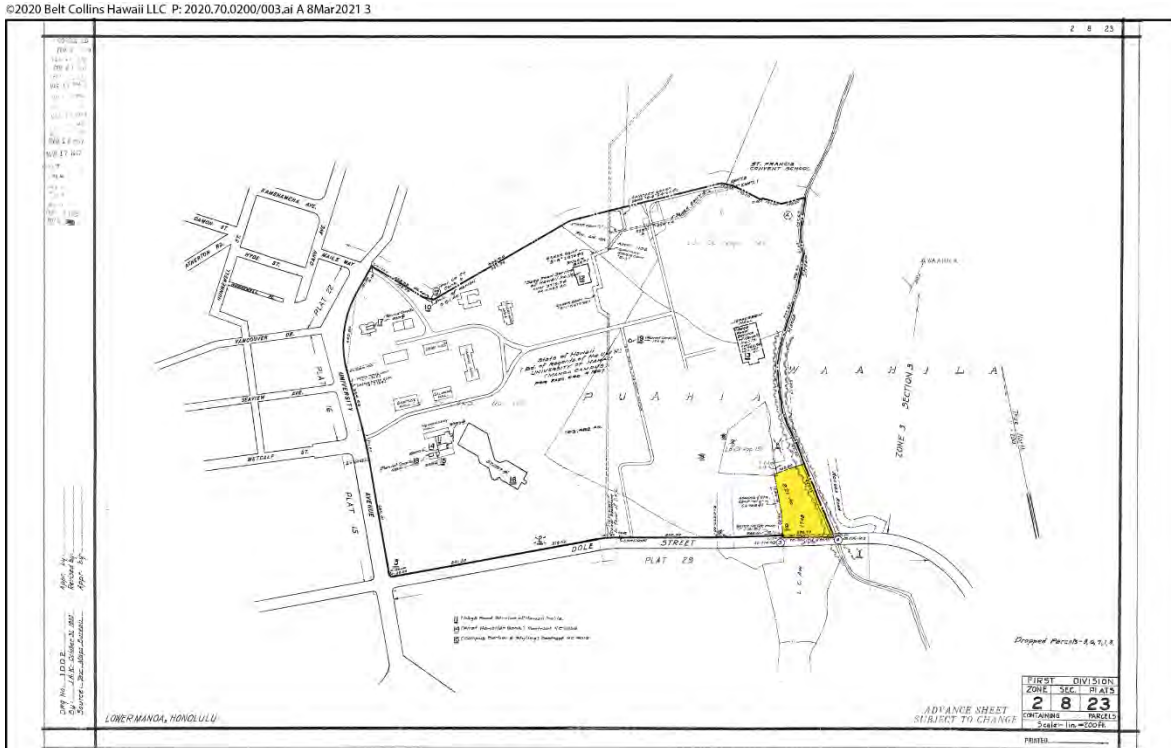


**Figure 1-1**  
**LOCATION MAP**

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021



**Figure 1-2: Tax Map Key**



Source: Land Use Commission



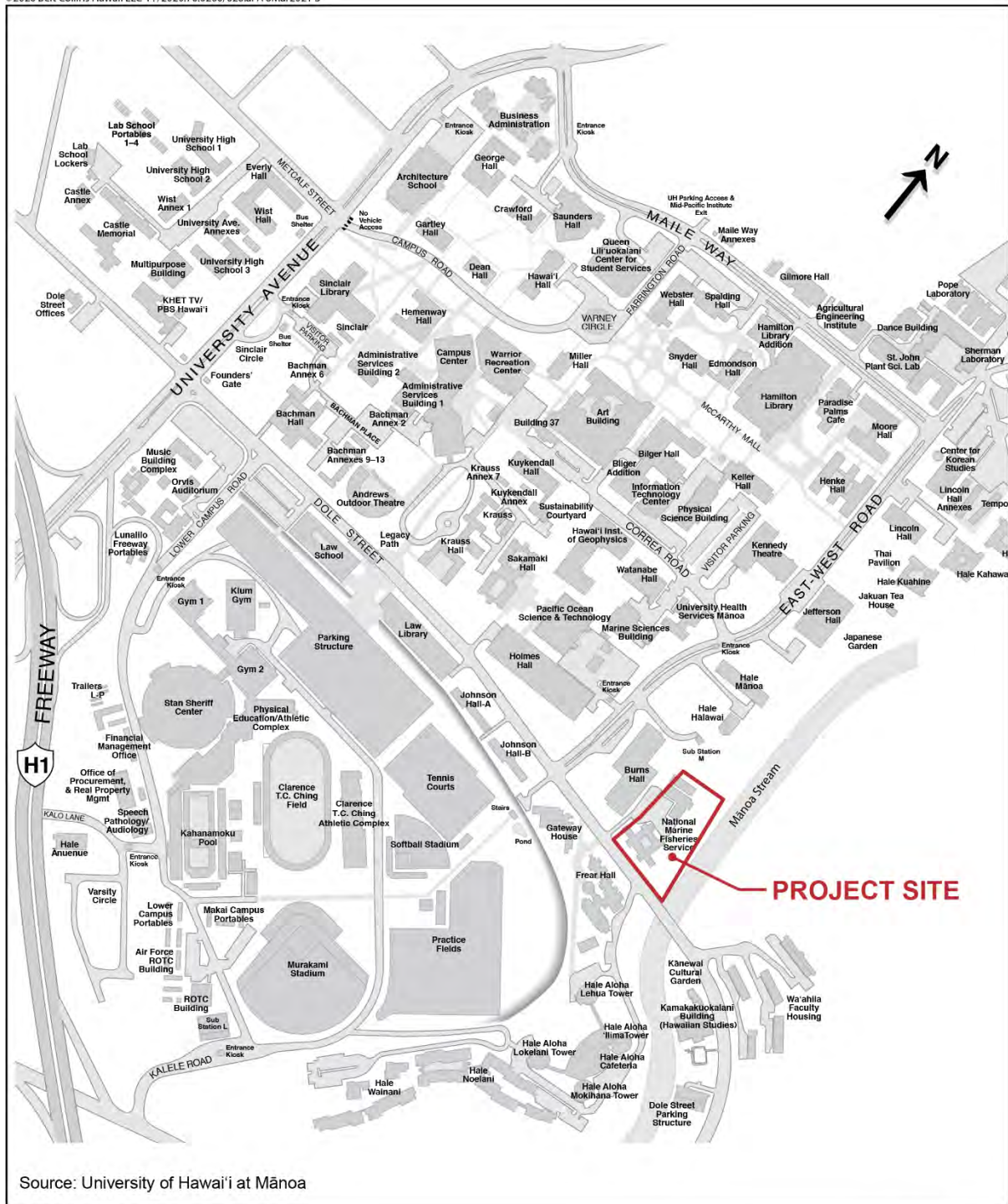
**Figure 1-2**  
**TAX MAP KEY**

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
 March 2021

Source: Land Use Commission

**Figure 1-3: Campus Location Map**

©2020 Belt Collins Hawaii LLC P: /2020.70.0200/028.ai A 8Mar2021 3



Source: University of Hawai'i at Mānoa

**BELT COLLINS**

**NORTH**

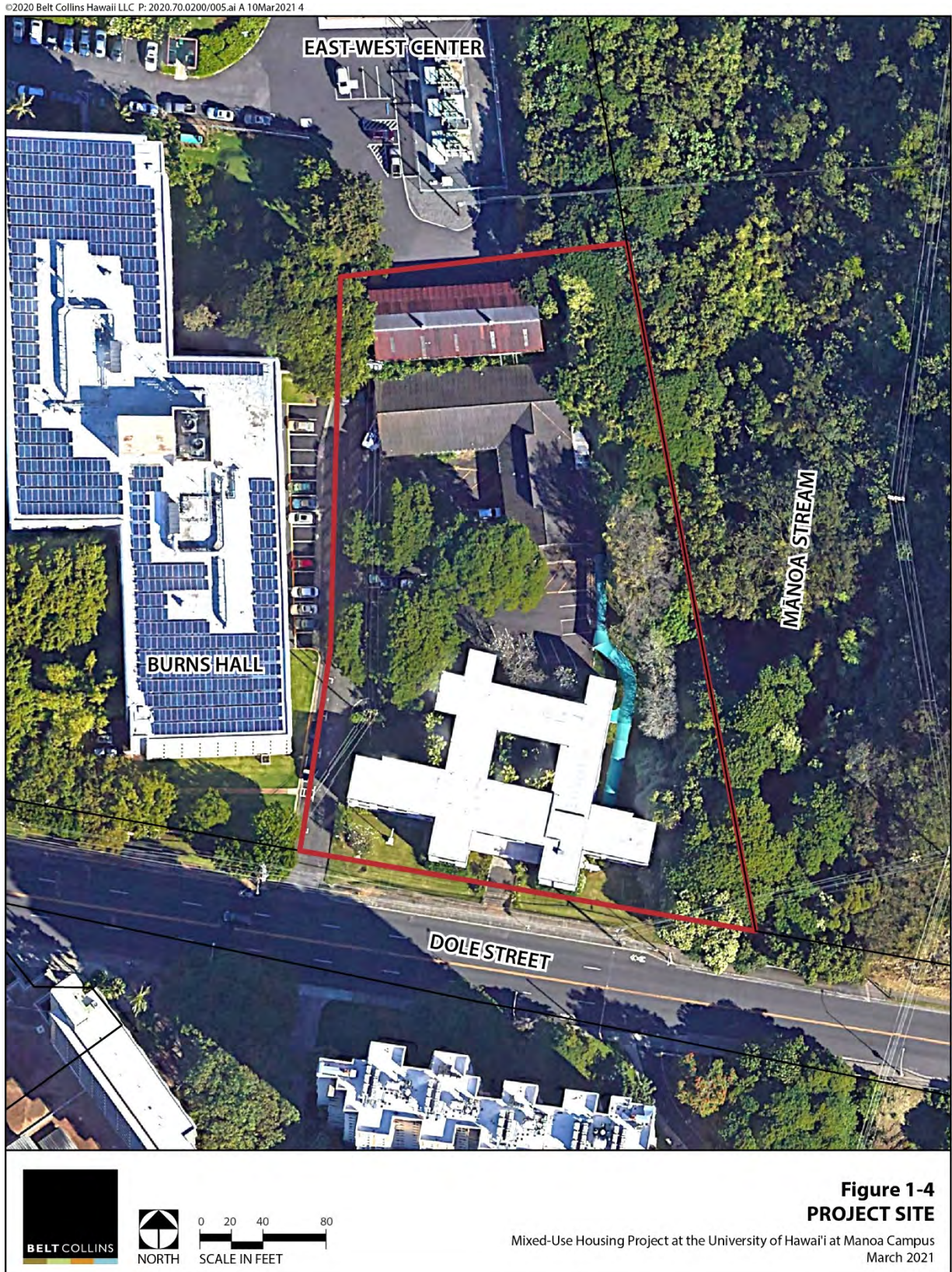
0 100 300 500  
SCALE IN FEET

**Figure 1-3**  
**CAMPUS LOCATION MAP**

Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus  
 March 2021



Figure 1-4: Project Site





### 1.3 PROJECT DESCRIPTION

UHM has entered a public-private partnership (P3) with Greystar Development Services, LLC (the “Developer”) to design, build, finance, operate and maintain a multi-family mixed-use rental housing project for UHM students and junior faculty that will provide rental rates below the market of the areas surrounding the UHM campus (the “Proposed Action”). The Proposed Action aims to achieve a “live, work, play” environment for students and residents and support long-term sustainability and connectivity goals for UHM by reducing the number of students commuting to campus each day and expanding the campus’ rental pool. Design elements aim to reflect the traditions, history and spiritual significance of Mānoa Valley and Hawaiian culture, with shaded common areas that visually connect pedestrians and residents to Mānoa Stream and green corridors between the “Upper Campus” and “Lower Campus.” These design features are also consistent with the energy efficiency status of Leadership in Energy and Environmental Design (LEED) Silver Certification, aiming to set a precedent for ecologically sensitive and sustainable campus development (*see* Figure 1-5).

The Proposed Action will demolish three existing structures on the 2.21-acre property and construct a new building that consists of two adjoining towers, a makai tower of no less than twelve stories and a mauka tower not to exceed eighteen (18) stories in height, connected by a two-story podium. The mixed-use, multi-family housing facility will include up to 400 individual housing units with a mix of studio, one-, two- and three-bedroom units. The bottom floors of the complex will be dedicated to childcare, retail, circulation and gathering spaces (*see* Figure 1-6). The childcare facility will replace the existing “UH Mānoa Children’s Center,” located at 2320 Dole Street ~~2600 Campus Road, Queen Lili’uokalani Center for Student Services #414B~~, which currently serves over 100 children of UHM students and employees between the ages of two and five years old. A small retail space is intended to promote gathering and circulation and will be accessible to residents and campus users. The Project Site is located in close proximity to the majority of campus amenities, including the existing athletic fields, dining centers, the UHM campus center and Warrior Recreation Center.

The Proposed Action was originally named “University of Hawai’i-Mānoa Campus Student and Faculty Multi-Family Housing” during the pre-assessment consultation process, and then “Mixed-Use Affordable Housing Project at the University of Hawai’i at Mānoa Campus” during the Draft Environmental Assessment (DEA) process. However, the Proposed Action has subsequently been renamed “Mixed-Use Housing Project at the University of Hawai’i at Mānoa Campus.” This change was implemented in order to better reflect the Project and avoid confusion regarding the term “affordable.” While the primary purpose of the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty, the rental units are not for the general public nor will they be income restricted.

**Figure 1-5: Conceptual Design Renderings**



Source: NAC Architecture. All of the images are for illustrative purpose only and subject to change.





Source: NAC Architecture. All of the images are for illustrative purpose only and subject to change.



Figure 1-6: Proposed Site Plan

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/008.ai A 10Mar2021 5



Source: NAC Architecture

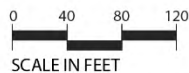
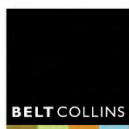


Figure 1-6  
PROPOSED SITE PLAN

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021

## 1.4 PURPOSE AND NEED

The primary purpose of the Proposed Action is to provide ~~affordable~~, family-oriented housing to UHM graduate students and junior faculty that are unable to utilize existing rental housing on the UHM campus or afford market rental housing in surrounding neighborhoods. UHM has identified the need for housing as a priority for future growth on the UHM campus. Due to the high cost of living in Hawai‘i, especially in the areas surrounding the UHM campus, many UHM students are forced to reside in other regions of the island and commute each day. The existing supply of subsidized housing is in high demand and therefore can only accommodate students and faculty that meet specific eligibility criteria (*see* Appendix A).

Existing residential facilities on the UHM campus only accommodate 21% of the total student body, while housing demand continues to increase. UHM aims to grow on-campus housing options in the long-term and achieve the themes of creating a “Globally Connected Hawaiian Place of Learning, Leadership and Service; Livable Urban Campus; and Outdoor Spaces for Living and Learning (UHM 2007).”

The Proposed Action is consistent with the planning and design guidelines set forth in the current 2007 LRDP and is one of several projects identified in the forthcoming 2019 LRDP update. It is in alignment with the guiding principles of the UHM Framework for the Future and Building Design and Performance Standards (BDPS) for the campus. The proposed structures will be developed in accordance with applicable standards of the Primary Urban Center Development Plan (PUC DP) and all applicable laws, rules and ordinances of the City and County of Honolulu (the “City”) and the State of Hawai‘i (the “State”).

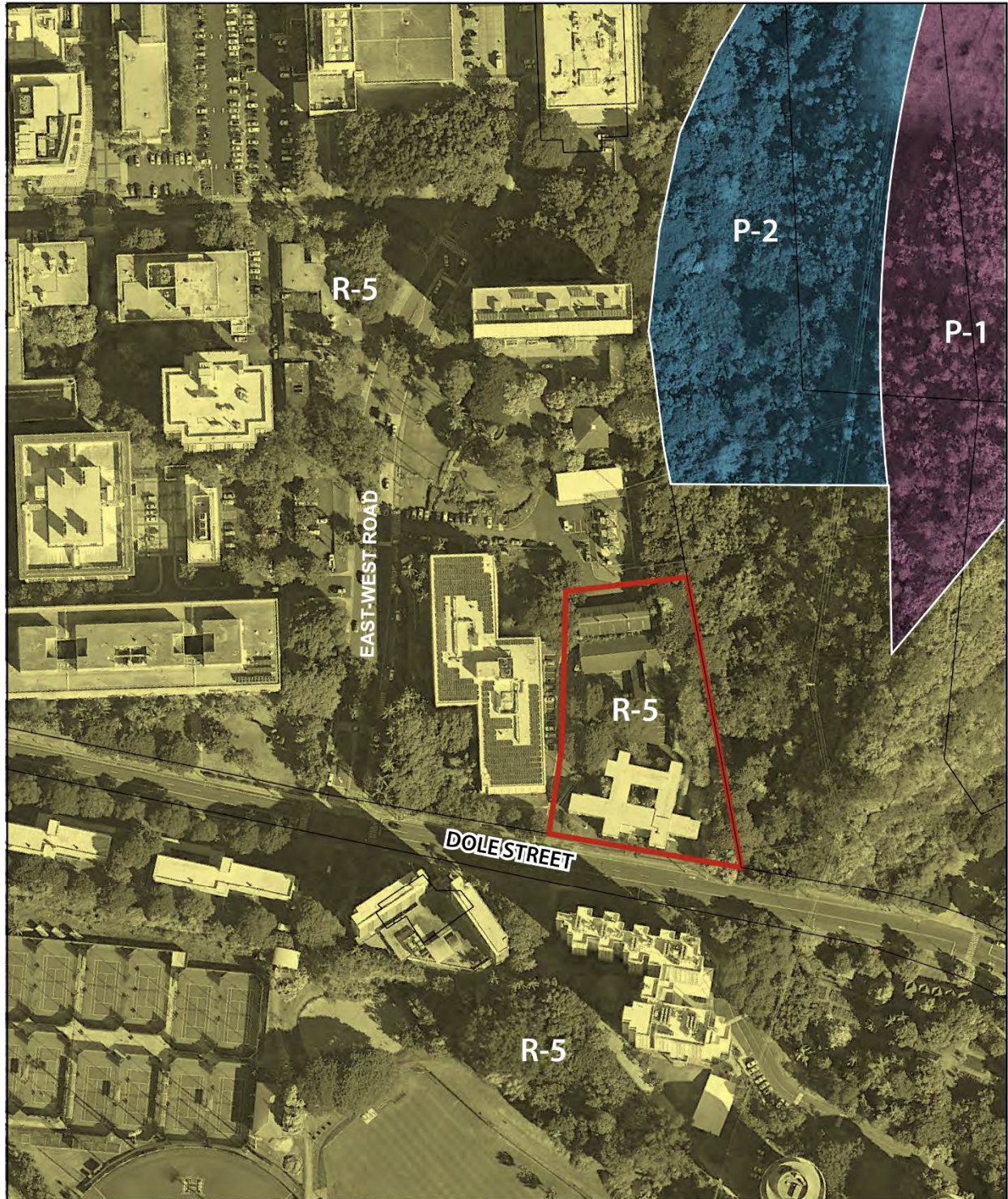
## 1.5 LAND TENURE

The Project Site is located on land currently owned by UHM. Previously, the land was held by NOAA as part of the Pacific Islands Fisheries Science Center Facilities. Upon the departure of NOAA after determining the facilities were not feasible to renovate or transform, the land was conveyed to UHM (WCIT 2017). The Developer will hold the sole-responsibility to design, build, finance, operate and maintain the proposed mixed-use, multi-family housing project under a long-term ground lease and property management arrangement. Upon the expiration of the long-term ground lease, ownership of the building will revert back to UHM, unless otherwise agreed by the parties. The Project Site is zoned as R-5 (residential) under the City ordinances and classified as Urban under the State Land Use statute (*see* Figure 1-7: Zoning Map and Figure 1-8: State Land Use Map). The Proposed Action will be permitted under a Minor Modification to the existing PRU (2009/PRU-3) following an environmental review in compliance with HRS §343.



Figure 1-7: Zoning Map

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/006.ai A 10Mar2021 3



0 50 100 200  
SCALE IN FEET

Figure 1-7  
ZONING MAP

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021



Figure 1-8: State Land Use Map

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/007.ai A 10Mar2021 3

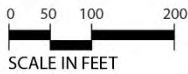
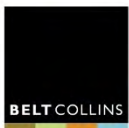
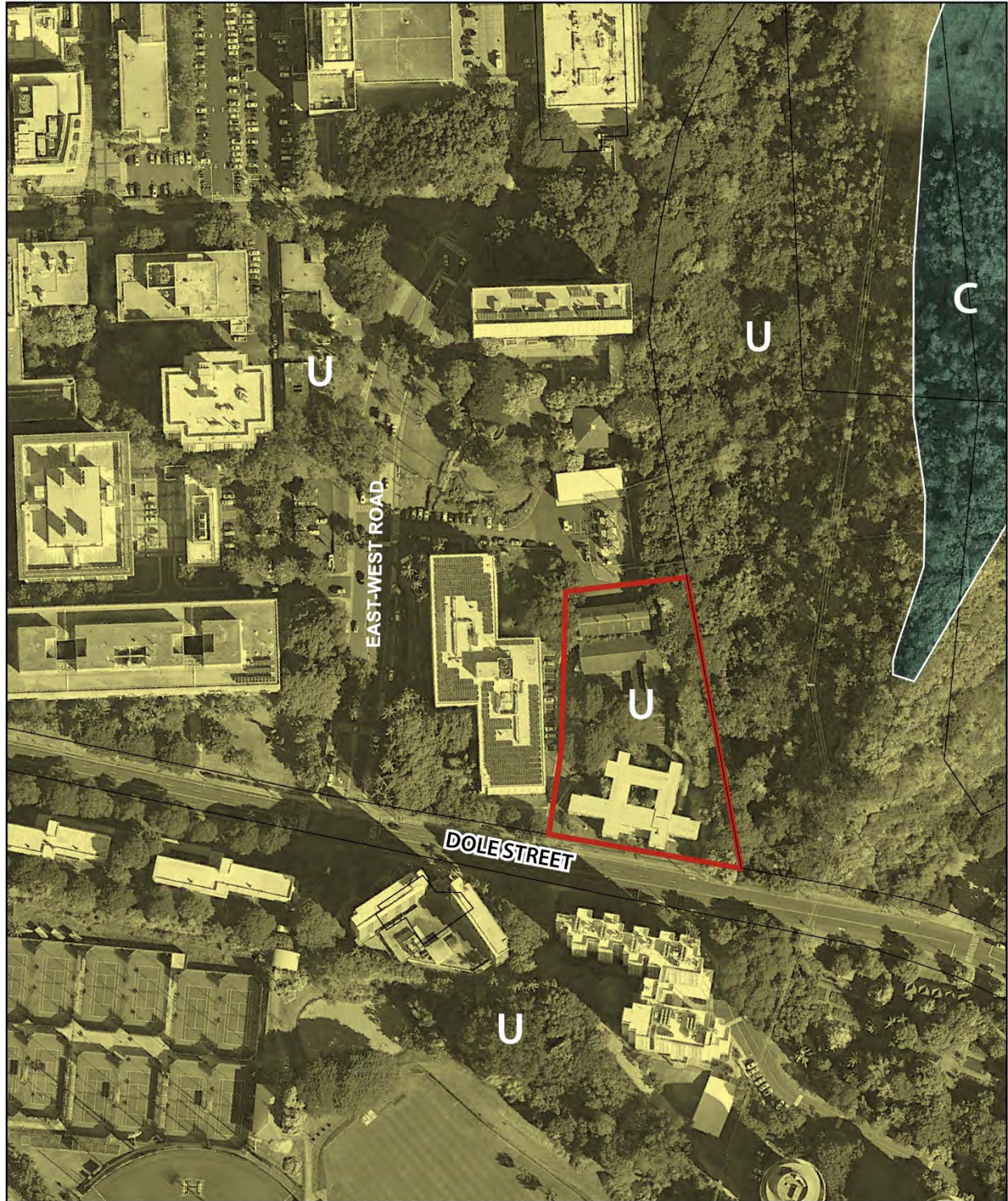


Figure 1-8  
STATE LAND USE MAP

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021

## **1.6 DEVELOPMENT SCHEDULE**

Construction of the project is anticipated to begin by Spring 2023 and end by Summer 2025. The housing facility is anticipated to open for the Fall 2025 semester.

## **1.7 ESTIMATED COST**

The project is anticipated to cost approximately \$85 million.



*(This page intentionally left blank)*

## 2 DESCRIPTION OF THE EXISTING ENVIRONMENT, IMPACTS AND MITIGATION

### 2.1 EXISTING LAND USE

The Project Site was formerly occupied by the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) (*see* Figure 2-1). Upon their departure, the site was conveyed to UHM. The existing structures include two single-story buildings (approximately 3,500 and 8,400 sf) in the northern section of the parcel and one two-story building (19,920 sf) on the southern boundary of the property (WCIT 2017; Mason 2020; DPP 2020). The main entrance of the southern-most building leads onto Dole Street by a stairway flanked by two basalt rock walls with cement adhesive. The site is currently used by UHM for temporary parking, storage and surge space, as permitted by its existing PRU.

The majority of ground surface around the three buildings is paved for parking and walking paths. Landscaping on the property is limited to grasses, manicured hedgerows, a single plumeria tree at the front entrance and various palm tree species in the center courtyard. Mānoa Stream runs along the east portion of the parcel, limiting the amount of buildable land at the Project Site. A rip-rap embankment leads down to the stream from the east facing structure. A bridge crosses over the stream along Dole Street.

### 2.2 REGIONAL SETTING

The UHM campus spans approximately 305+ acres of land in Mānoa Valley, located in the moku (district) of Kona (renamed to Honolulu in 1859) and the Mānoa/Waikīkī Ahupua‘a (USGS 1998). Mānoa is a wide, generally flat valley floor that is within the PUC DP of Honolulu. The valley extends back approximately three or more miles from the Project Site until it meets the Ko‘olau Mountain range. Residential neighborhoods, public facilities and commercial shopping centers reaching into the back of the valley serve nearly eleven-thousand residents, according to 2010 census data (Upper Mānoa - 3,335 | East Mānoa - 2,415 | UHM Campus - 5,093).<sup>1</sup>

The climate of Mānoa Valley is characterized by relatively stable tropical temperatures, ranging from an average low of 70.9 degrees Fahrenheit (F) in January, to an average high of 77.7 degrees F in August. The summer season, from May through September, is generally warm and dry with predominant northeast trade winds that range between eight to fifteen miles per hour (mph). The winter season, from October to April, is generally characterized by higher rainfall and less prevalent trade winds (SCS 2020).

---

<sup>1</sup> [https://census.hawaii.gov/census\\_2010/demographic/demo\\_profile\\_ct\\_oahu/](https://census.hawaii.gov/census_2010/demographic/demo_profile_ct_oahu/) (DEBT 2010)

**Figure 2-1: Existing Land Use**



*Aerial front view*



*Front view*

Source: University of Hawai'i at Mānoa





*Side front view*



*Side Elevation, Left Side of Dole Street*





*Side Elevation, Right Side of Dole Street*



*Front Elevation, Left Side*





*Front Elevation, Right Side*



*Center Courtyard*





*Rear Elevation, North Wing*



*Rear View, Shared parking area and existing structures*



*Annex Building*





*Mānoa Stream, East Property Boundary*



*Mānoa Stream, Rip-Rap Embankment*





*Dole Street Bridge at Mānoa Stream*

## 2.3 PHYSIOGRAPHY

### 2.3.1 Geology

Mānoa Valley is located at the base of the Ko‘olau Mountains, formed over several hundred thousand years of eruption and erosion activity known as the Honolulu Volcanic series. Lava and sedimentation flowing through the valley formed hard basalt underlying the valley floor.

### 2.3.2 Topography

The regional topography of Mānoa Valley generally slopes down around five degrees towards the ocean. The Project Site slopes down south towards Dole Street and east towards Mānoa Stream. A lava rock retaining wall, built in 1953, fronts the south side of the building. There is an approximate six-foot difference in elevation from the building finish floor to the sidewalk along Dole Street. The Dole Street roadway alignment has a vertical crest curve at approximately the driveway along the west side of the property, thus the frontage of the site along Dole Street slopes to the east (see Figure 2-2: Topography Map).

Elevations at the eastern portion of the Project Site drop abruptly where the existing structures meet the embankment edge of Mānoa Stream. Stream topographic elevations are 65 feet (ft) and 62 ft above mean sea level (amsl) to the east of the NOAA Building, with the top of the bank at elevations of 78 ft to 84 ft. The stream elevation at the Dole Street Bridge is at 57 ft (WCIT 2017). To avoid impacts to Mānoa Stream from grading, the design of the pedestrian path, which is currently proposed to be located near the eastern side of the property, will be sited with considerations for the Stream’s natural contours and topographic features.

### 2.3.3 Soils

According to the United States Department of Agriculture (USDA) Soil Conservation Service’s (SCS) *Soil Survey of Islands of Kaua‘i, O‘ahu, Maui, Moloka‘i and Lāna‘i, State of Hawai‘i*, there are two distinct soils in the Project Site: Makiki stony clay loam (MIA) and Rock land (rRk) (USDA SCS, 2019)(see Figure 2-3: Soil Map).

The majority of the Project Site is composed of Makiki stony clay loam, which is characterized by zero to three percent slopes with a high concentration of angular stones, making up approximately fifteen percent of the soil by volume (Foote et al. 1972:92). This soil is typically characterized as well drained and level in topography, but often contains enough stones to hinder cultivation. Basalt cinders typically reach depths of twenty to sixty inches; basalt outcrops are common. The soil is neutral to slightly acid. The Capability Classification is IIIs, non-irrigated, which indicates severe limitations for cultivation due to stony and shallow conditions, unfavorable texture and low water-holding capacity.

The eastern edge of the property, bordered by the Mānoa Stream, consists of Rock land. This land typically consists of twenty-five to ninety percent exposed rock, with forty to seventy



Figure 2-2: Topography Map

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/016.ai A 10Mar2021 4

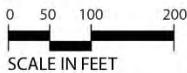
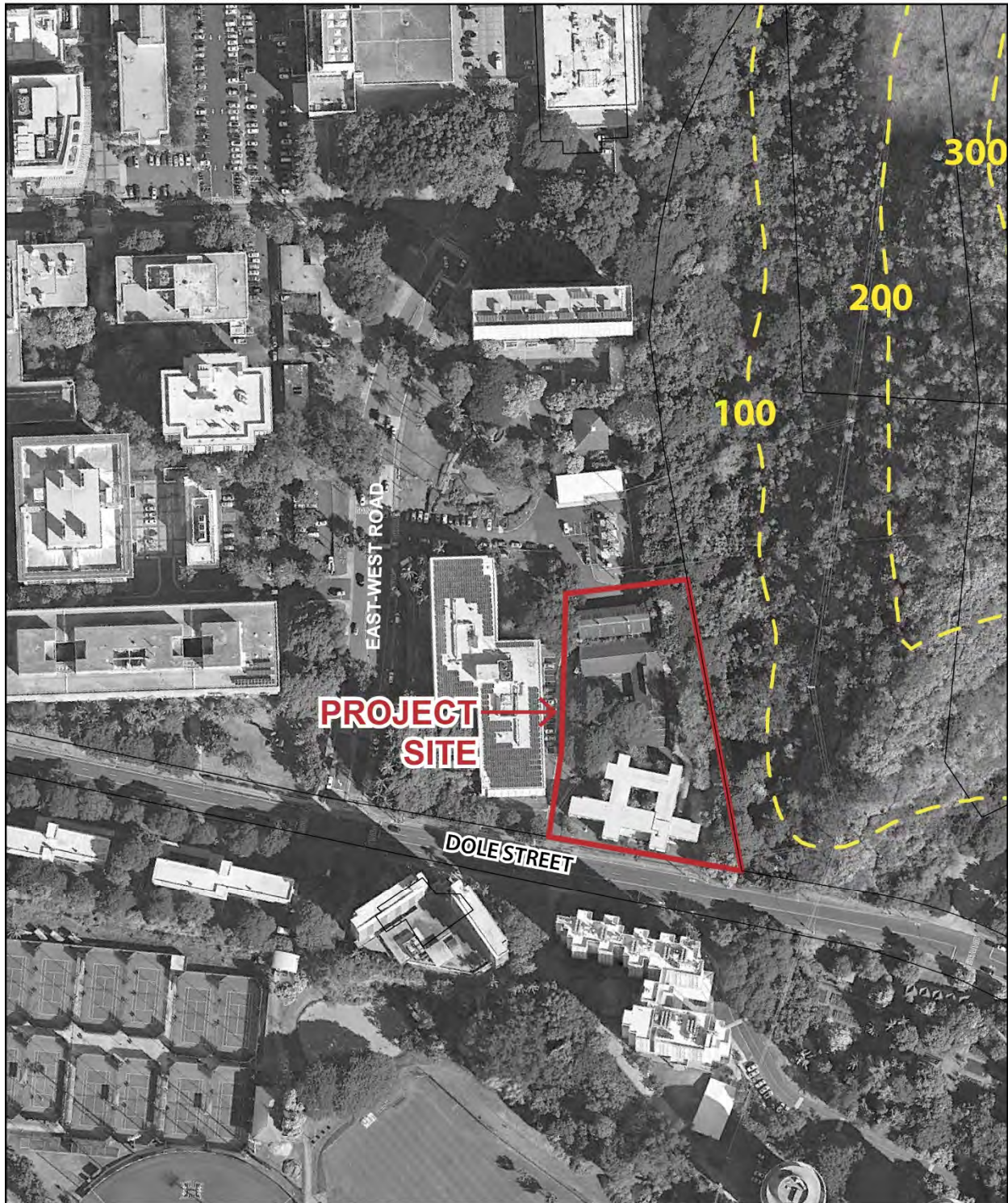


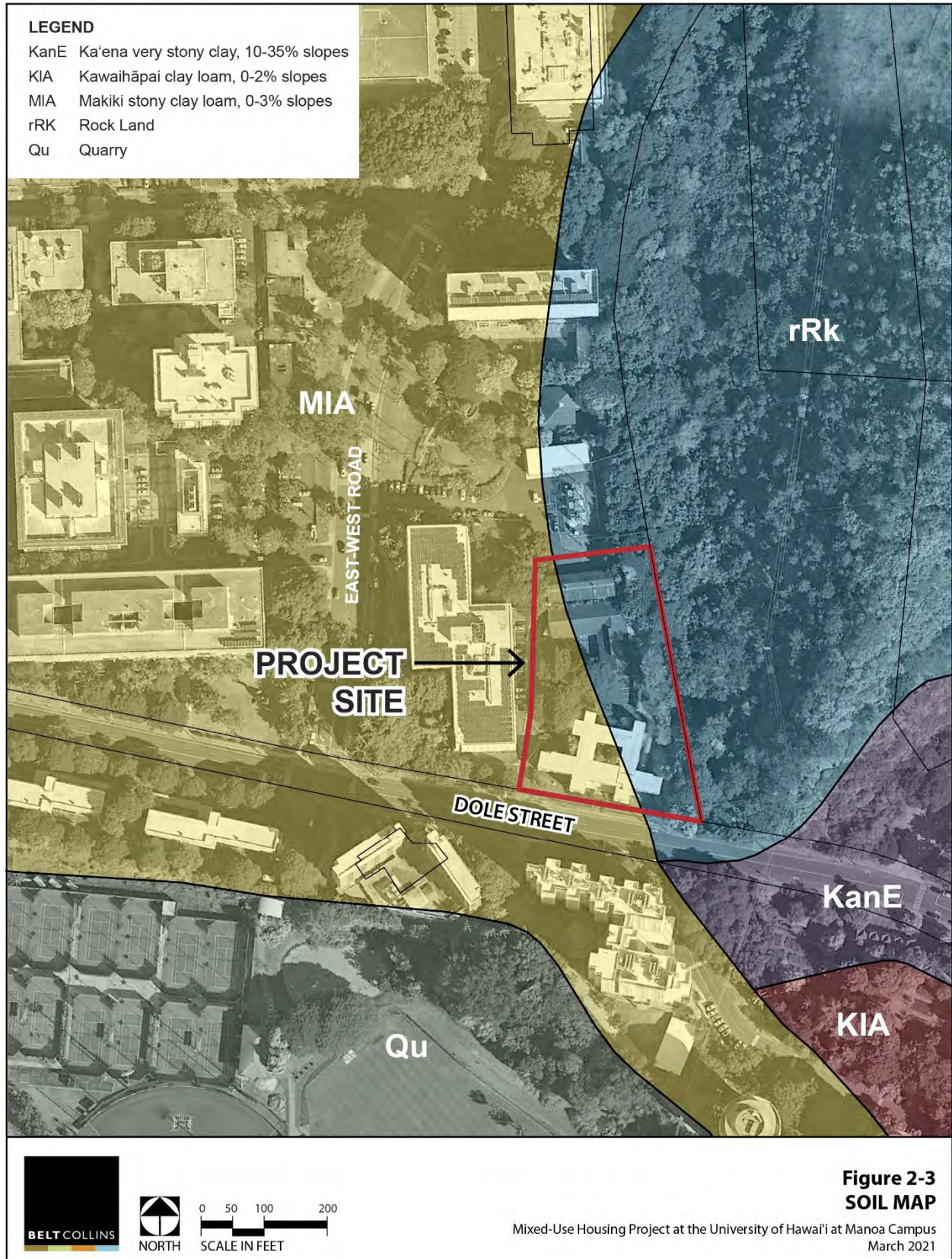
Figure 2-2  
TOPOGRAPHY MAP

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021



**Figure 2-3: Soil Map**

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/011.ai A 10Mar2021 5



percent slopes and soils less than a few inches deep. Stones are common and can roll to lower areas when loosened (Foot et al. 1972:30).

### 2.3.3.1 Impacts and Mitigation

The Proposed Action would implement construction and planting phases to limit the potential for surface disturbance during construction. All excavation and grading activities will be regulated by applicable provisions of the City's grading ordinances (Hawaii Administrative Rules (HAR) Chapter 14, Articles 13 through 16) and any SHPD requirements for archaeological monitoring. Excavation and grading activities will incorporate erosion control best management practices (BMPs) to preserve existing conditions of nearby surface waters, such as:

- Temporary sediment basins;
- Temporary diversion berms and swales to intercept runoff;
- Silt fences;
- Dust fences;
- Slope protection;
- Stabilized construction vehicle entrance;
- Grate inlet protection;
- Truck wash down areas; and
- Use of compost filter socks.

Permanent sediment control measures will be used once construction is complete. No short- or long-term significant impacts to soils are anticipated during construction or operation of the Proposed Action, and no additional mitigation is required.

## 2.4 HYDROLOGY

### 2.4.1 Rainfall

The mean annual rainfall in the vicinity of the Project Site is approximately 864 millimeters (mm) or 34 inches (in), ranging from an average low of about 36.5 millimeters (mm) (1.4 in) in June to an average high of about 118.8 mm (4.7 in) in December (SCS 2020).

### 2.4.2 Groundwater

The Project Site is located in the Honolulu Sector, Palolo Aquifer System (Geologic Code 3010111), in which the groundwater is unconfined basal in flank lava. The aquifer is currently used to supply fresh drinking water (with less than 250 milligrams per liter [mg/l] of chlorine), that is considered irreplaceable and highly vulnerable to contamination (Status Code 11111). According to Mink and Lau (1987), the water table in all unconfined basal aquifers is forty ft or less amsl.



### 2.4.2.1 Impacts and Mitigation

The Proposed Action would adhere to stringent BMPs during construction and operation to preserve groundwater resources. No wastewater injection wells, contaminated materials or wastes would be released into the ground. Any materials or wastes produced during construction or operations would be handled in compliance with the necessary City or State regulatory requirements. No short- or long-term significant impacts to groundwater are anticipated during construction or operation of the Proposed Action, and no additional mitigation is required.

### 2.4.3 Surface Water

Surface waters near the Project Site include Mānoa Stream, which is located within the Ala Wai Watershed (see Figure 2-4 **Error! Reference source not found.**). Surface waters of Mānoa Stream descend from the Koʻolau Mountains (3,105 ft), run through Mānoa Valley and eventually discharge into the Ala Wai Canal. According to the 2016 report by AECOS entitled *Biological and Water and Sediment Quality Surveys in Mānoa Stream, Honolulu, Hawaiʻi*, the Project Site is located within the “middle reach” of Mānoa Stream, which is classified as Class 2 inland waters (AECOS 2016) (see Figure 2-5: Inland Water Classification Map). HAR §11-54 defines Class 2 waters as follows:

*“The objective of Class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping and navigation. The uses to be protected in this class of waters are all uses compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation on and in these waters. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class. No new treated sewage discharges shall be permitted within estuaries.”*

Data from the 2014 *State of Hawaiʻi Water Quality Monitoring and Assessment Report* (HDOH, 2014a) determined that Mānoa Stream was not meeting criteria for its designated beneficial uses, as described above, and is therefore considered “impaired” on the Clean Water Act (CWA) §303(d) list.

### 2.4.3.1 Impacts and Mitigation

The Proposed Action would adhere to stringent BMPs during construction and operation to preserve surface water resources. There would be no encroachment on any waters of the United States (U.S.), and therefore additional permitting with the Army Corps of Engineers would not be required. Any discharges related to the construction or operation of the Proposed Action would comply with applicable State Water Quality Standards as specified in HAR §11-54 and HAR §11-55. A National Pollutant Discharge Elimination System (NPDES)

permit would be obtained for storm water runoff during construction activities if soil disturbances exceed one acre of land at the Project Site. Because of the Project's close proximity to Mānoa Stream, the Developer will coordinate with Ka Papa Lo'i 'O Kanewai to monitor the water quality of Mānoa Stream entering the lo'i. There are no anticipated impacts to aquatic resources, however in the extremely unlikely event that accidental discharges occur the Department of Land and Natural Resources, Division of Aquatic Resources (DAR) will be notified immediately. No short- or long-term significant impacts to surface waters are anticipated during construction or operation of the Proposed Action, and no additional mitigation is required.



Figure 2-4: Map of Ala Wai Watershed

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/017.ai A 10Mar2021 3



Source: DOH 2002

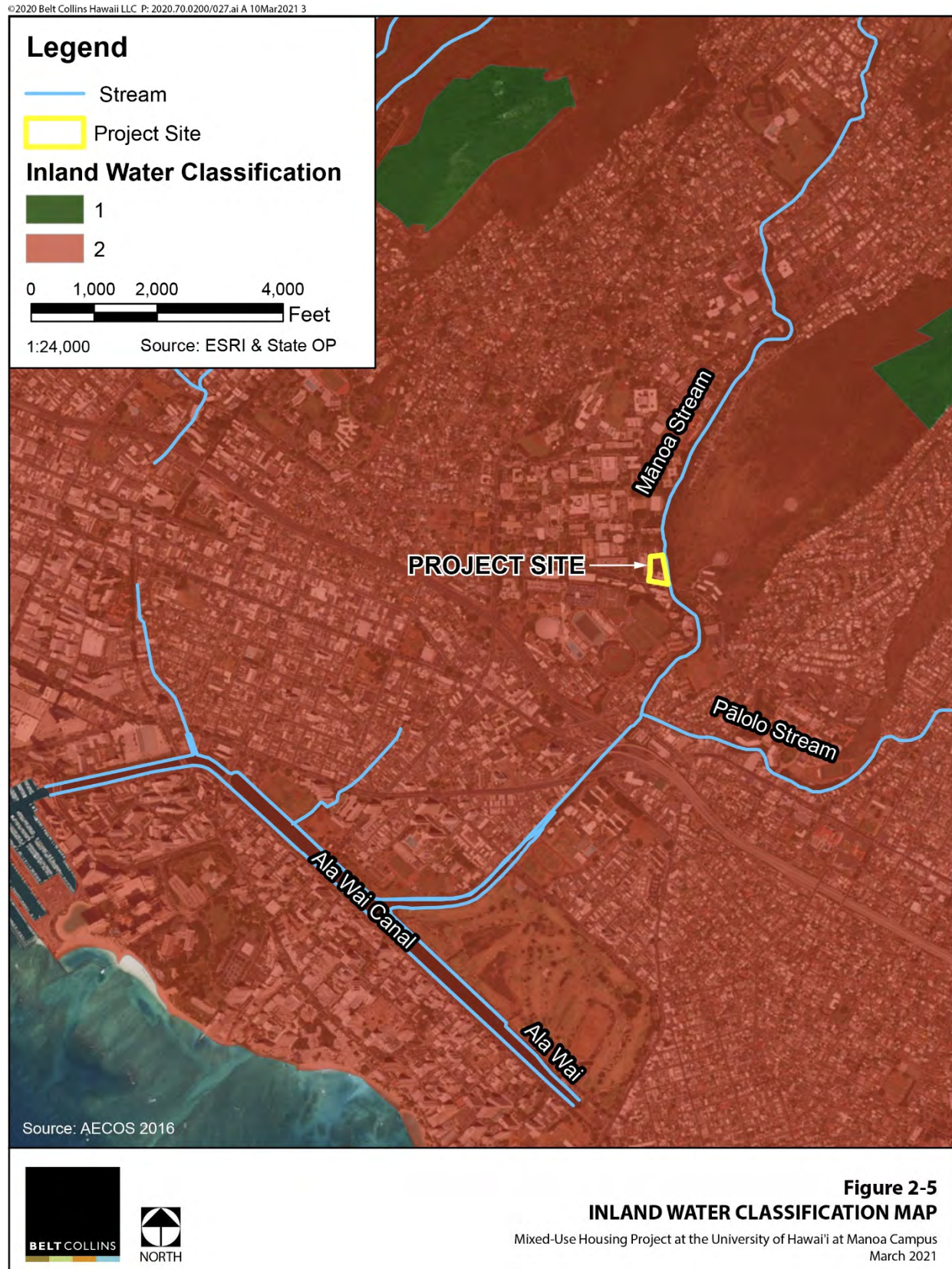


**Figure 2-4**  
**MAP OF ALA WAI WATERSHED**

Mixed-Use Housing Project at the University of Hawai'i at Manoa Campus  
March 2021



Figure 2-5: Inland Water Classification Map



#### 2.4.4 Coastal Water

The nearest coastal water is located off of Waikīkī Beach in Māmala Bay, approximately 1.6 miles south of the Project Site (see Figure 2-6: Water Quality Classification Map). Mānoa Stream flows into Māmala Bay after entering the Ala Wai Canal. The Ala Wai Canal also receives waters from the Palolo and Makiki Streams prior to entering Māmala Bay. According to HAR §11-54, these coastal waters are classified as Class A marine waters and recognized as follows (HDOH, 2014b):

*“It is the objective of Class A waters that their use for recreational purposes and aesthetic enjoyment be protected. Any other use shall be permitted as long as it is compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters. These waters shall not act as receiving water for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class. No new sewage discharges will be permitted within embayments. No new industrial discharges shall be permitted within embayments.”*

##### 2.4.4.1 Impacts and Mitigation

The Proposed Action would adhere to stringent BMPs during construction and operation to preserve coastal water resources. No discharges would occur to groundwater, surface waters or coastal waters. Any materials or wastes produced during construction or operations will be handled in compliance with the necessary City or State regulatory requirements. No short- or long-term significant impacts to coastal waters are anticipated during construction or operation of the Proposed Action, and no additional mitigation is required.

## 2.5 NATURAL HAZARDS

### 2.5.1 Climate Change

As the Earth’s climate continues to shift around the world, it is recognized that island communities are particularly vulnerable to natural hazards. Current projections of sea level rise anticipate a 3.2 ft sea level rise exposure area (SLR-XA) as early as 2060 (Sweet et al., 2017), leading to a series of consequential impacts such as coastal erosion, intermittent flooding, storm surges, king tides and contamination of groundwater. Although the Project Site is not located within the 3.2-ft SLR-XA (see Figure 2-7), it is anticipated that these impacts may soon require City and State planning entities to adapt land use regulations and mitigation for increasing climate hazards. Storms, drought and heavy rains are also expected to increase in frequency and volatility, causing more flash



Figure 2-6: Water Quality Classification Map





flooding, runoff, sedimentation and potential impacts to existing infrastructure in regions across O‘ahu.

### 2.5.1.1 Impacts and Mitigation

No significant impacts are anticipated as the Proposed Action will adhere to applicable plans and policies related climate change mitigation and adaption, such as:

- Mayor’s Directive on Climate Change (Directive 18-2);
- Land Use and Zoning Recommendations;
- Transit-Oriented Development (TOD) Adaption Guidelines;
- Building Code Updates;
- Future Conditions Climate Resilience Design Guidelines;
- Long Term Disaster Recovery Plan; and,
- Climate Adaption Strategy.

To address the effects of global climate change, the final project design will incorporate conservation BMPs that are consistent with LEED Silver Certification standards, including Low Impact Development that may help mitigate the potentials for elevated temperatures and evapotranspiration on the Project site.

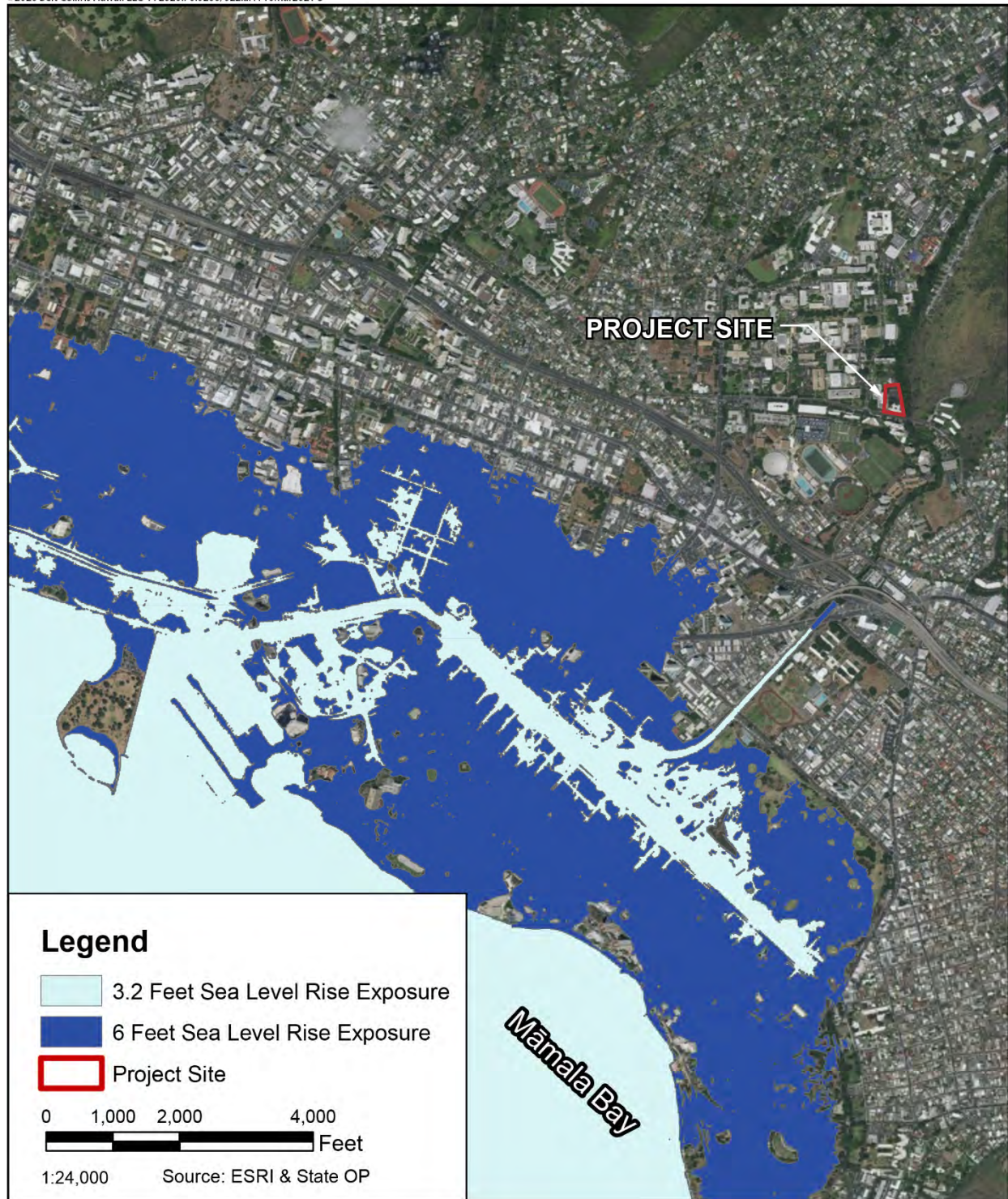
### 2.5.2 Flood

According to the Federal Emergency Management Agency’s (FEMA) Flood Insurance Rate Map (FIRM), the majority of project site is designated as Zone “X” which is determined to be outside the 0.2% annual chance flood plain (*see* Figure 2-8). The portion of the parcel that borders Mānoa Stream is designated as Zone AEF which is determined to be within the 1% annual chance flood plain. The vertical limits of Zone AEF lie approximately twelve (12) ft below the top of the stream bank. Although the proximity to Mānoa Stream may pose a moderate risk during extreme flood events, no significant risk is anticipated under normal conditions.

In October 2004, Mānoa Valley experienced a major flash flood event that caused severe damage to the UHM campus and surrounding residences. Post-flood studies conducted by the U.S. Army Corps of Engineers indicated the cause to be insufficient capacity of clogged drainage channels in upper Mānoa Valley that pushed floodwaters overtop channel banks onto new courses and paths. Drainage channels have since been improved and repaired so that major flood impacts are not expected to pose imminent threats to the area. Potential impacts from flash flooding at Mānoa Stream may include erosion and sedimentation in nearby waters. However, overall risk to surrounding infrastructure is considered low.

Figure 2-7: Sea Level Rise Exposure Map

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/022.ai A 10Mar2021 3



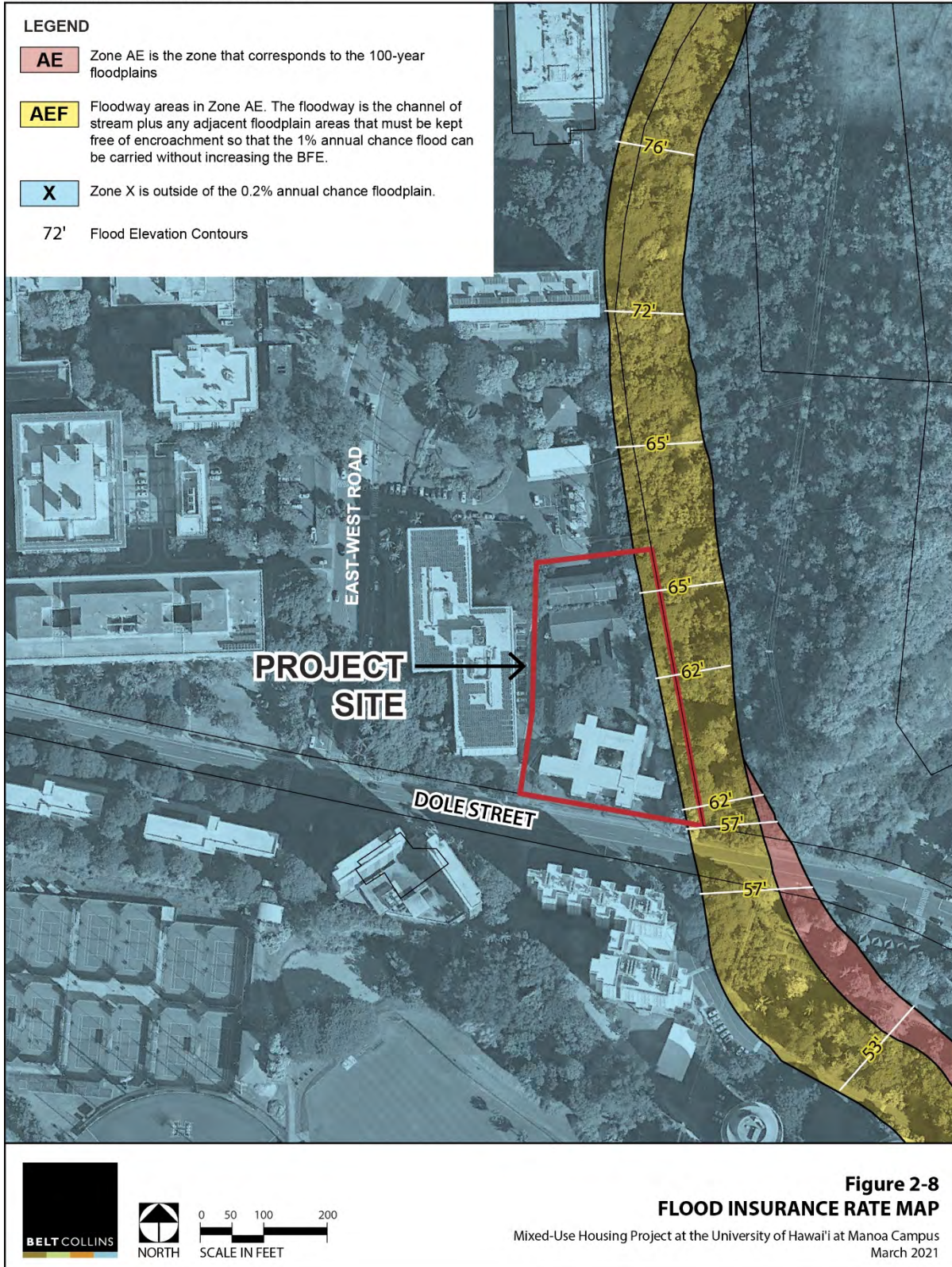
**Figure 2-7**  
**SEA LEVEL RISE EXPOSURE MAP**

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021



**Figure 2-8: Revised Flood Insurance Rate Map**

©2020 Belt Collins Hawaii LLC. P: 2020.70.0200/012.ai A 10Mar2021 5



### **2.5.2.1 Impacts and Mitigation**

The Proposed Action would incorporate safety measures and built-in flood protection safeguards, such as elevated first floor and flood proofed walls, to minimize hazards at the Project Site. No construction activities or operations would occur within Zone AEF. Therefore, no short- or long-term significant impacts from flood hazards are anticipated, and no additional mitigation is required.

### **2.5.3 Tsunami**

According to the City's Tsunami Evacuation Zone map, the Project Site lies entirely within the tsunami evacuation safe zone and would not be impacted by any tsunami inundation (see Figure 2-9: Tsunami Hazard Map Figure 2-9: Tsunami Hazard Map).

#### **2.5.3.1 Impacts and Mitigation**

No short- or long-term significant impacts from tsunami hazards are anticipated, and no additional mitigation is required.

### **2.5.4 Hurricane**

In Hawai'i, seasonal hurricanes have the potential to cause severe damage to property, land and life, primarily occurring from the late summer and early winter months. Early warning systems, such as Civil Defense sirens, radio and television broadcasts and news reports are deployed to provide residents with time to prepare and evacuate susceptible areas and situations. Specific impacts of a hurricane at the Project Site are difficult to predict due to differences in atmospheric pressure, tidal stage, topography and location of the site relative to the eye of a storm.

#### **2.5.4.1 Impacts and Mitigation**

The Proposed Action would be constructed in accordance with enhanced wind design criteria, which are more stringent than the International Building Code (IBC), as adopted and amended by the City. No short- or long-term significant impacts from hurricane hazards are anticipated, and no additional mitigation is required.

### **2.5.5 Earthquake**

Earthquakes associated with volcanic or tectonic activity occur frequently in Hawai'i; however, many are too small to cause noticeable effects. The southern shoreline of O'ahu lies within the Moloka'i Seismic Zone, which is classified as 2A Seismic Zone under the Uniform Building Code (UBC) with earthquakes that may cause minor damage to structures. The majority of risk associated with earthquakes come from partial or total building collapse,



Figure 2-9: Tsunami Hazard Map

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/021.ai A 10Mar2021 3

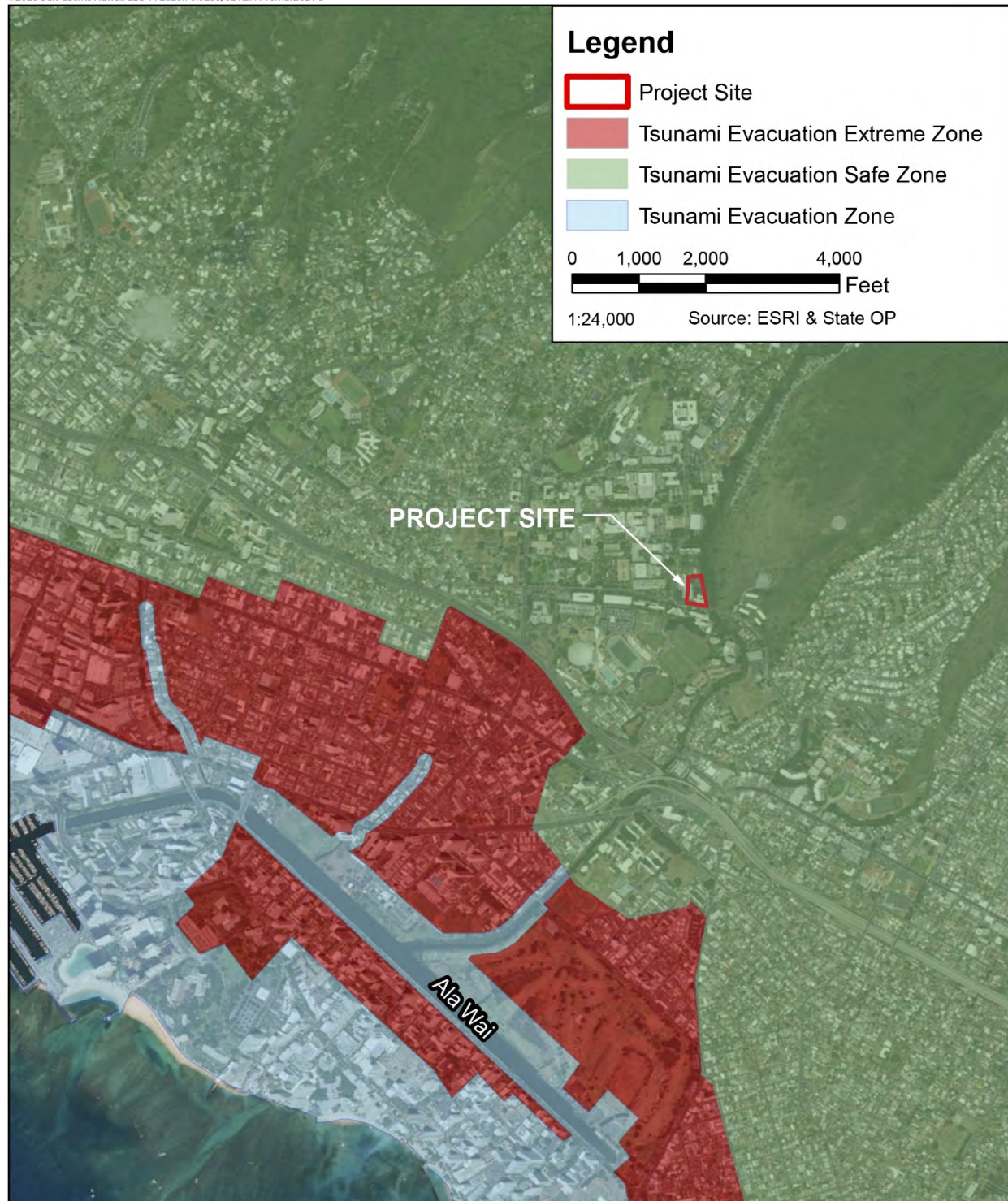


Figure 2-9  
TSUNAMI HAZARD MAP

Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus  
March 2021

falling objects, debris and shattering glass. Although O‘ahu has not experienced significant impacts from earthquakes in recent decades, the Honolulu coastline is considered to have moderately high vulnerability to earthquakes (Fletcher et al., 2002).

### 2.5.5.1 Impacts and Mitigation

The Proposed Action would adhere to local building codes to minimize potential impacts of future seismic activity. No short- or long-term significant impacts from earthquake hazards are anticipated, and no additional mitigation is required.

## 2.6 HAZARDOUS MATERIALS

A *Hazardous Materials Assessment Survey* was conducted by Bureau Vistas at the Project Site as a part of the Hawai‘inuiākea Architectural Design Program (WCIT 2017). The purpose of this survey was to assess the existing structures prior to potential future renovation activities. The survey analyzed building material samples for the presence of asbestos-containing materials (ACM), lead-based paint (LBP) and arsenic-containing materials (AsCM), as well as the visual inspection of polychlorinated biphenyls (PCB)-containing materials. The survey also conducted a subsurface soil assessment for the presence of chemicals of potential concern (COPC) due to the historical application of pesticides at the Project Site.

### 2.6.1 Building Hazards

#### 2.6.1.1 Asbestos

Thirty-eight types of suspect ACM were identified and sampled in accordance with HAR Title 11, Chapter 501, Standard for Demolition and Renovation. Suspect ACM samples were analyzed using the Environmental Protection Agency (EPA) Method 600R-93/116 polarized light microscopy (PLM). Table 2-1 provides a summary of the ACM sample collection results. The EPA and the State Department of Health (DOH) define ACM as materials that contain greater than one percent (1%) asbestos fibers. Laboratory analysis identified the following seven building materials that contain asbestos above the regulatory limit:

**Table 2-1: Summary of Asbestos Sample Collection Results**

Building Material	Material Location	Type & Percent
<b>1<sup>st</sup> Floor</b>		
9- by 9-inch black with white and green speckled vinyl floor tile	Rooms: 101, 101A, 101B, 107, 110, 111, 113, 117, 118, 119, 120, 122 and 123A	Chrysotile 4-5%

Building Material	Material Location	Type & Percent
black vinyl floor tile beneath 12- by 12- inch mauve vinyl floor tile	Rooms: 114, 114A and 116	Chrysotile 4%
black vinyl floor tile beneath 12- by 12- inch gray “peel-n-stick” vinyl floor tile	Room 108	Chrysotile 4-5%
white fibrous backing beneath 12- by 12- inch gray “peel-n-stick” vinyl floor tile	Room 109	Chrysotile 15%
<b>2<sup>nd</sup> Floor</b>		
9- by 9-inch black with white and green speckled vinyl floor tile	Rooms: 201, 203, 204, 205, 206, 207, 212, 213, 214, 214A, 215, 216, 217, 222, 223 and 224	Chrysotile 4-6%
black vinyl floor tile beneath 12- by 12- inch beige vinyl floor tile	Rooms: 210 and 221	Chrysotile 3-5%
black sink undercoating	Room 207	Chrysotile 6-14%

### 2.6.1.2 Lead

Seventeen paint samples were collected from interior and exterior surfaces of the existing structures in accordance with the Hawai‘i Occupational Safety and Health (HIOSH) Lead in Construction Standards. The paint samples were analyzed for total lead content using EPA Method 7000B Atomic Absorption Spectrophotometry (AAS). Table 2-2 provides a summary of the LBP sample collection results. The EPA and the Department of Housing and Urban Development (HUD) defines paint as lead-based when it contains one-half percent (0.5%) or more lead-by-weight. Laboratory results identified the following five paints that contain lead concentrations above the regulatory limit:

**Table 2-2: Summary of Lead Sample Collection Results**

Paint Description/Location	Sampling Location	Lead Content Percent by weight
<b>1<sup>st</sup> Floor</b>		
Brown paint	Interior, corridor, beam	1.8000
<b>2<sup>nd</sup> Floor</b>		
White paint (over green and pink paints)	Interior, corridor, ceiling/eave	3.5000
Green paint (over beige paint)	Interior, janitor closet near Room 201	0.6500
Brown paint (over green and red paints)	Interior, stairway handrail, near Room 204 and Women’s Restroom	0.6100
Brown paint	Interior, corridor, handrail	2.7000



### 2.6.1.3 Arsenic

Three (3) suspect AsCM were identified and collected for laboratory analysis in accordance with all applicable HIOSH requirements. Suspect AsCM samples were analyzed using the EPA recommended Method 3051/6010B inductively coupled plasma (ICP). Table 2-3 provides a summary of the AsCM sample collection results. The EPA defines a material as arsenic-containing when it contains an arsenic concentration of 100 milligrams per kilogram (mg/kg) or more. Laboratory samples identified the following two samples that contain arsenic above the regulatory limit:

**Table 2-3: Summary of Arsenic Sample Collection Results**

Material Description	Sampling Location	Arsenic (mg/kg)
2- by 2-foot fibrous holed “canec” wall and ceiling tile	Room 108, right wall near light switch	1,700.0
fibrous “canec” bulletin board	Room 213	96.0

### 2.6.1.4 Chemicals

Stored chemicals and readily accessible mechanical equipment (electrical transformers, smoke detectors, emergency lights, etc.) were assessed for the potential of environmentally-hazardous components. Fluorescent lighting fixtures were also assessed for the presence or absence of PCB-containing lighting ballasts and mercury-containing fluorescent bulbs. Mercury-containing materials are considered universal waste under HAR §11-273 and are managed in accordance with the 40 Code of Federal Regulations (CFR) Part 273. The study observed numerous suspect mercury-containing fluorescent light tubes and one high-intensity discharge (HID) / high energy discharge (HED) bulbs within the project structure.

### 2.6.1.5 Impacts and Mitigation

The Proposed Action would perform a thorough inspection for the presence of hazardous building materials prior to demolition activities. Proper removal, storage and disposal methods for each hazardous material would be conducted in accordance with all applicable City and State requirements. All contractors would adhere to stringent BMPs and mitigation measures to prevent the distribution of hazardous materials to the surrounding environment. Regulations for handling materials under the Occupational Safety and Health Administration (OSHA) would be implemented for worker safety. No significant impacts are anticipated, and no additional mitigation is required.

## 2.6.2 Soil Hazards

Three subsurface boreholes were tested for the presence COPC using the EPA recommended Method 8081. The COPC identified on-site was limited to organochlorine pesticide technical chlordane. Survey results were analyzed using the DOH Tier 1 Environmental Action Levels (EALs), which is the evaluation for sites located less than 150 meters from a surface body water or classified as a potential source of drinking water. The Project Site is located inland of the Underground Injection Control (UIC) Line, and therefore determined to have groundwater utility that is classified as a potential source of drinking water. Table 2-4 provides a summary of the soil sample results. The DOH Tier 1 EAL is 7.6 mg/kg. The study concluded that organochlorine pesticide technical chlordane is present in soils under the building below the concrete slab at concentrations less than DOH Tier 1 EAL.

**Table 2-4: Summary of Soil Sample Collection Results**

Location	Sample ID	Collection Interval	Sample Results (mg/kg)
B1-- Ground floor exterior concrete walkway by Room 114	S1	0.5 to 2 ft bgs	2.083
B2-- Ground floor exterior concrete walkway by Room 121	S2	0.5 to 1.5 ft bgs	0.120
B3 - Ground floor inside Room 105	S3	0.5 to 1 ft bgs	ND<0.050

### 2.6.2.1 Impacts and Mitigation

The Proposed Action would adhere to stringent BMPs during demolition and construction to manage pesticide-contaminated soils at the Project Site. It is recommended that an Environmental Hazard Evaluation (EHE) and Environmental Hazard Management Plan (EHMP) are prepared to evaluate potential hazards and address long-term management requirements associated with the pesticide-impacted soil. Proper removal, storage and disposal would be conducted in accordance with all applicable City and State requirements. No short- or long-term significant impacts are anticipated, and no additional mitigation is required.

## 2.7 NATURAL ENVIRONMENT

### 2.7.1 Flora

A *Flora and Fauna Survey* was conducted on June 26, 2020 by SWCA Environmental Consultants (*see Appendix B*) and the following is a summary of the findings. The Project Site is identified as an altered urban environment, with much of the area composed of buildings, paved parking and walking paths. Two vegetation types were identified on-site: landscaped

and streamside ruderal. Landscaped vegetation around the existing buildings include common ornamental species, such as plumeria (*Plumeria rubra*), hibiscus (*Hibiscus rosa-sinensis*), monkeypod (*Samanea saman*) and Bermuda grass (*Cynodon dactylon*). Streamside ruderal vegetation along Mānoa Stream include a range of non-native species that have adapted to disturbed streamside areas, such as parasol tree (*Macaranga tanarius*), Chinese banyan (*Ficus microcarpa*), koa haole (*Leucaena leucocephala*) and Guinea grass (*Urochloa maxima*). No Federal- or State- listed species were identified at the Project Site. The vegetation types and plant species identified during the survey are not considered unique.

### 2.7.1.1 Impacts and Mitigation

The Proposed Action would adhere to stringent BMPs during construction and operation to preserve flora resources at the Project Site. Construction and landscaping phases would be implemented to control erosion and protect the existing natural landscape. No alterations would occur to the landscape within Zone AEF. Contractors would implement the following measures, wherever possible, to reduce the potential for unintended spreading of non-native plant species:

- Regularly clear equipment, materials and personnel of excess soils and debris;
- Minimize the movement of soil and plant material between worksites;
- Wash and/or inspect imported equipment and materials for the presence of invasive species by a qualified botanist or entomologist prior to entering the Project Site;
- Purchase raw construction materials (e.g. fill) from on-island supplies to avoid the introduction of non-native species;
- Maximize use of native plant species or non-invasive plant species for landscaping; and
- Sterilize gear, such as work boots and vehicles, to prevent the spread of fungal pathogens.

The Proposed Action would incorporate natural landscaping features that create shaded pedestrian corridors and gathering spaces for residents and visitors on the Project Site. While a proposed landscape, tree disposition, and open space plan have not yet been developed for the Proposed Action, these plans will be prepared in consultation with the UHM's LRDP landscape guidelines and will strive to reflect the traditions, history and spiritual significance of Mānoa Valley and the Hawaiian culture. The landscape and open space plan will describe design elements that include shaded common areas which strive to visually connect the pedestrians and residents to the Mānoa Stream and green corridors between the Upper and Lower Campus. These plans will incorporate considerations for low impact development and BMPS while maximizing the use of native or non-invasive plant species.



Landscaping will remain consistent with the objectives established by UHM's LRDP. No short- or long-term significant impacts to flora are anticipated during construction or operation of the Proposed Action, and no additional mitigation is required.

## 2.7.2 Fauna

Fauna observed during the flora and fauna survey primarily consisted of common avian species found in urban, garden and disturbed waterways on O'ahu. Of the fourteen species detected, only two were native species: the black-crowned night heron (*Nycticorax nycticorax*) or 'Auku'u and white tern (*Gygis alba*), also known as the Manu-o-Kū. These two species, as well as the house finch (*Haemorhous mexicanus*) and the cattle egret (*Bubulcus ibis*) observed on-site, are protected by the Migratory Bird Treaty Act (MBTA). No native invertebrates were observed. Non-native mammal species observed during the survey include feral cats (*Felis catus*), domestic dogs (*Canis familiaris*) and small Indian mongoose (*Herpestes javanicus*).

Suitable nesting habitat for all of the observed species protected under the MBTA, including the State-listed white tern, was found on-site. White terns are generally known to nest around the UHM campus, but none were observed nesting during this survey. Suitable roosting and foraging habitat were identified for two Federal- and State-listed species: the Hawaiian Hoary Bat (*Lasirus cinereus semotus*) and Hawaiian Duck (*Anas wyvilliana*). However, the preferred habitats of the Hawaiian Duck, montane streams and marshlands, are not located at or near the Project Site. Suitable habitat for the Federal- and State- listed Hawaiian Stilt (*Himantopus mexicanus knudseni*) was identified at the Papa Lo'i O Kānewai located downstream from the Project Site. None of these listed species were observed on the Project Site during the survey period and are not anticipated to occur on-site, with the exception of the Hawaiian Hoary Bat.

The Project Site does not overlap with critical habitat for any listed terrestrial faunal species and the on-site habitat is not expected to support any other listed species beyond those previously discussed.

### 2.7.2.1 Impacts and Mitigation

The Proposed Action would adhere to stringent BMPs during construction and operation to protect fauna and habitats located at the Project Site. Short-term alterations would occur to landscaping around the existing buildings. No alterations would occur along Mānoa Stream. There are no anticipated impacts to aquatic resources, however in the extremely unlikely event that accidental discharges occur DAR will be notified immediately. The following measures would be taken during construction to prevent potential disturbances to nesting or foraging sites at the Project Site:

- Conduct nesting bird surveys by a qualified biologist within 72 hours prior to initiating construction, tree trimming or tree removal activities or after three (3) or more consecutive days of inactivity;
- Report active nesting sites of white terns to the Department of Forestry and Wildlife (DOFAW) and avoid active branches until the nest is determined inactive by a qualified biologist;
- Avoid active nesting sites of other MBTA protected species until the nest is determined inactive by a qualified biologist;
- Avoid construction activities with the potential to create temporary or permanent standing water to prevent waterbirds, such as the Hawaiian Duck or Hawaiian Stilt, from entering the Project Site;
- Avoid nighttime construction work during the seabird fledging season, between September 15 and December 15;
- Use of downfacing and shielded light fixtures, to prevent the disruption of seabirds in flight; and
- Avoid impacts to vegetation during the Hawaiian Hoary Bat birthing and pupping season, between June 1 and September 15;

If avoidance is not possible during this time frame, the Developer will consult with DOFAW prior to any disturbance, trimming or removal of woody vegetation greater than 15 ft (4.6 m) in height. No short- or long-term significant impacts to fauna are anticipated, and no additional mitigation is required.

## **2.8 AIR QUALITY**

Air quality data for the Project Site is based on the Air Quality Index reported by Honolulu, Hawai'i Station No. 9 located at the HECO's power plant in Downtown Honolulu. Existing air quality conditions are classified as "good" with no major pollutants exceeding the National Ambient Air Quality Standards. The six criteria pollutants set by the EPA include carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, ozone and particulate matter. One additional criteria pollutant, hydrogen sulfide, is regulated in the State of Hawai'i to evaluate potential air quality impacts related to volcanic activity on Hawai'i Island. No major pollutant generators, such as industrial incinerators or manufacturing plants, have been identified in the area, and there are no heavily trafficked thoroughfares or intersections generating excessive exhaust. Air quality at the Project Site is generally maintained as "good" due to the consistent flow of northeasterly trade winds that disperse pollutants towards the ocean.

### 2.8.1.1 Impacts and Mitigation

The Proposed Action would adhere to stringent BMPs during construction and operation to preserve existing air quality conditions. Project phasing and mitigation measures will be used to control fugitive dust, such as installing dust fences, spraying water on exposed soils and replanting vegetation as soon as possible to reduce potential sources of short-term exposure. Potential emissions would be negligible and quickly dissipate by northeast trade winds crossing through the Project Site.

The Proposed Action is designed to encourage multi-modal transportation systems, such as pedestrian, bicycle and public transit, that will not contribute to long-term air emissions. The Proposed Action will adhere to all applicable Hawai'i State Department of Health rules and standards regarding air pollution, asbestos, and fugitive dust. No short- or long-term significant impacts to air quality are anticipated during construction or operation of the Proposed Action, and no additional mitigation is required.

## 2.9 ACOUSTIC ENVIRONMENT

The acoustic environment surrounding the Project Site is consistent with an urban-residential setting. The majority of existing sound impacts are related to UHM activities as students and faculty travel across the campus along Dole Street. These activities occur throughout the week, and at a lesser extent in the evenings and on the weekends. Soundscapes of Mānoa Stream may be audible during these quieter hours.

### 2.9.1.1 Impacts and Mitigation

The Proposed Action would have short-term impacts to the acoustic environment from construction activities, such as excavation, grading and paving, that would vary according to the particular phase of construction. Mitigation measures would include the use of noise-attenuating equipment, such as mufflers and adherence to noise curfews. Each contractor would be responsible for maintaining noise levels within the regulatory limits, pursuant to HAR §11-46, "Community Noise Control." Contractors would be required to obtain a noise permit if construction noise levels are expected to exceed regulatory limits.

The Proposed Action would have a slight increase in long-term ambient noise levels due to an increase in pedestrian, residential and childcare activities at the Project Site. These impacts would generally occur during weekday hours and be consistent with the existing uses and activities. No short- or long-term significant impacts to the acoustic environment are anticipated, and no additional mitigation is required.



## 2.10 SCENIC RESOURCES

The visual characteristics of the Project Site provide a balance of urban and natural settings. The built environment includes several mid-sized buildings that accommodate classroom, office and residential activities on the UHM campus. Scenic resources accessible from the Project Site include the Mānoa Stream and Wa‘ahila Ridge. Visibility down to the stream while on the parcel is limited due to the presence of dense foliage between the stream and developed area. Unobstructed views of Mānoa Stream may be obtained while on the pedestrian bridge across Dole Street or other points of access across campus. More distant scenic resources include Diamond Head Crater, Waikīkī Beach and the Ko‘olau Mountains beyond Mānoa Valley.

The Developer considered several design schemes with a focus on the scenic resources when determining building height, setback and configuration. Careful consideration was given to the visual impact and mass the buildings would create along Dole Street and the surrounding neighborhoods. Some of the alternative design schemes considered, but rejected for their potential impacts, included two 15-story buildings and setbacks closer to Dole Street. See Section 6: Alternatives Considered for more details. The preferred design scheme is consistent with the visual characteristics of the surrounding area, for examples *see* Figure 2-10: Key Observation Point (Dole Street x St **Louis Drive**) through Figure 2-14: Key Observation Points (Alphonse Place x Wa‘ahila Ridge)

### 2.10.1.1 Impacts and Mitigation

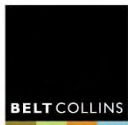
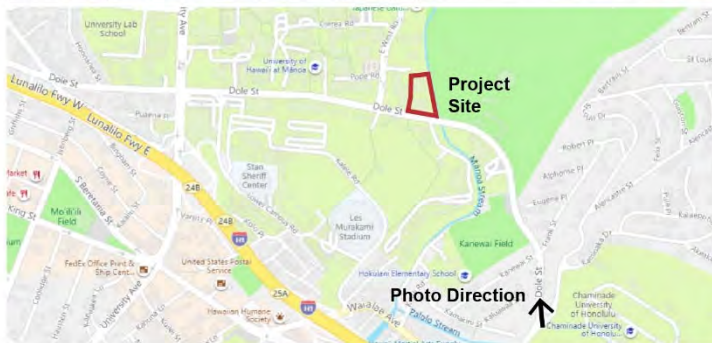
The Proposed Action would remain consistent with the visual characteristics of the surrounding area, including both urban and natural settings. Both structures of the housing facility will adhere to development guidelines of the City, State and UHM. The following key observation points (KOPs) were selected to assess the potential for visual impacts of the Proposed Action on scenic resources:

1. Dole Street and St Louis Drive (*see* Figure 2-10: Key Observation Point (Dole Street x **St Louis Drive**))
2. Dole Street and Mānoa Stream (*see* Figure 2-11: Key Observation Points (Dole Street x **Mānoa Stream**))
3. Dole Street and University Avenue (*see* Figure 2-12: Key Observation Points (Dole Street x **University Avenue**))
4. Dole Street and East-West Road (*see* Figure 2-13: Key Observation Points (Dole Street x **East-West Road**))
5. Alphonse Place across Wa‘ahila Ridge (*see* Figure 2-14: Key Observation Points (Alphonse Place x **Wa‘ahila Ridge**))

The Proposed Action is consistent with the character and size of surrounding buildings and does not anticipate having any significant impact to scenic resources in the surrounding area. Visual accessibility to Mānoa Stream will remain consistent with existing conditions. No significant impacts to scenic resources are anticipated, and no additional mitigation is required.

**Figure 2-10: Key Observation Point (Dole Street x St Louis Drive)**

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/032.ai A 10Mar2021 3



**Figure 2-10**  
**KOP (Dole Street x St. Louis Drive)**

Mixed-Use Housing Project at the University of Hawai'i at Manoa Campus  
March 2021



**Figure 2-11: Key Observation Points (Dole Street x Mānoa Stream)**

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/033.ai A 10Mar2021 3



**Figure 2-11**  
**KOP (Dole Street x Mānoa Stream)**

Mixed-Use Housing Project at the University of Hawaii'i at Manoa Campus  
March 2021



Figure 2-12: Key Observation Points (Dole Street x University Avenue)

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/034.ai A 10Mar2021 3



Figure 2-12  
KOP (Dole Street x University Avenue)

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021



Figure 2-13: Key Observation Points (Dole Street x East-West Road)

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/034.ai A 10Mar2021 3

**BEFORE**



**AFTER**



**Figure 2-13**  
**KOP (Dole Street x East-West Road)**

Mixed-Use Housing Project at the University of Hawai'i at Manoa Campus  
March 2021



Figure 2-14: Key Observation Points (Alphonse Place x Wa'ahila Ridge)

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/036.ai A 10Mar2021 3



Figure 2-14  
KOP (Alphonse Place x Wa'ahila Ridge)

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021

*(This page intentionally left blank)*

### **3 HISTORIC, ARCHAEOLOGICAL AND CULTURAL RESOURCES**

#### **3.1 HISTORIC PROPERTIES**

Three buildings exist on the Project Site, but none are presently listed on the Hawai'i or National Register of Historic Places. The two single-story annex buildings and the two-story NMFS administrative building were constructed at the Project Site after the Territory of Hawai'i conveyed the land to UHM in support of the Pacific Ocean Fisheries program.

In 1949, the U.S. Fish and Wildlife Service sought bids to construct the administrative building and selected noted architect Guy Rothwell to design the structure. The final design was minimalist in form, devoid of ornamentation and subtly invoked earlier interpretations of "International Style" along the lines of Hawai'i's 1940's military construction (Mason 2020). The finished building was a two-story stucco structure that contained 50 rooms, including biological and chemical laboratories, offices, and a library. The adjacent annex buildings housed biological collections, aquaria for experiments, a cold storage refrigeration plant, a garage, and a workshop (Mason 2020). In 1970, when NOAA was formed, the administrative and annex buildings were moved under their jurisdiction.

A Reconnaissance Level Survey (RLS) was conducted by Mason (2020) on the Project Site (attached as Appendix C) to evaluate whether the three buildings are eligible for listing on the Hawai'i and National Registers of Historic Places. The RLS noted that while the NMFS building has historic significance for its role in NOAA and commercial fishing, substantial changes to the original design and character over the past 70 years have resulted in the loss of this building's historic integrity. It also found that while the two annex buildings were previously part of the NMFS complex, neither was individually eligible for listing and the loss of the administrative building's historic integrity rendered grouping the buildings as a historic site or district inappropriate. Based on this, the RLS determined that none of the buildings are eligible for listing on the State or National Registers.

##### **3.1.1.1 Impacts and Mitigation**

The Proposed Action would demolish all three existing structures on the Project Site. None of these structures are considered eligible for historic listing. Therefore, no significant impact to historic properties would occur, and no additional mitigation is required.

#### **3.2 CULTURAL RESOURCES**

The Project Site is located within the moku (district) of Kona, within the Waikīkī Ahupua'a and the 'ili of Mānoa. The Project Site was utilized during the pre-European Contact and Historic periods by Native Hawaiians for agriculture and scattered habitation-sites. This is consistent with many mo'olelo (story/legend/history) of Mānoa Valley that described it as



containing abundant freshwater sources such as streams and springs. Agriculture, mainly wetland kalo (taro) cultivation in lo'i and inland fishponds, covered most of the Mānoa Valley floor during the pre-European Contact and early Historic periods. Historic accounts of Mānoa Valley describe the quantity and quality of agriculture production in the region being a continuous spread of lo'i and fishponds extending from the valley out to the sea.

During the post-European Contact period, agriculture cultivation continued in the valley and it was a favored spot of ali'i. During this time, the land use and landscape appearance were similar to that of the pre-European Contact period landscape. However, this all changed following the Māhele of 1848, when private land ownership was established to the islands. A total of 68 Land Commission Awards (LCA) were issued for Mānoa Valley. The Project Site is located within the northern portion of LCA No. 1748 that was originally described as a house lot containing three homes bounded by a fence.

After the Māhele, urbanization in the late 19<sup>th</sup> and early 20<sup>th</sup> Centuries drastically modified the land use in Mānoa Valley. The lo'i and inland fishponds were replaced with housing, and as early as 1889, areas encompassing and adjacent to the Project Site were transformed into the Mo'ili'ili Quarry. In ill-fated effort by Chinese immigrants to shift from taro cultivation to growing rice quickly failed, and there are records that the valley was used as pastureland for more than one dairy enterprise. Following World War II and the induction into Statehood, the agricultural to urban change accelerated even more rapidly to accommodate a growing population in Honolulu and its surrounding areas.

With the transition to urbanization, many of the lo'i existing in the valley were removed but remnants of their presence remained. One example is the Ka Papa Lo'i 'O Kānewai, also known as the Kānewai Cultural Garden. Located less than a quarter of a mile downstream from the Project Site, Ka Papa Lo'i 'O Kānewai was rediscovered and restored in the 1980's and is an actively cultivated lo'i. It receives water from Mānoa Stream and is used to educate students and visitors about the cultural significance and historic agricultural practices of kalo cultivation. For further information, see Appendix C which is the Archaeological Literature Review and Field Inspection (ALRFI) for the Proposed Action.

In addition to the updated information on the cultural resources contained in the ALRFI that was completed in 2020, a Cultural Impact Assessment (CIA) was completed by Cultural Surveys Hawai'i in 2008 (CSH) for the UHM 2007 LRDP update and current PRU. This 2008 CIA was a source material in preparing the DEA and has been included as Appendix H.

CSH's CIA included community consultation and a site visit with Makahiapo (Hiapo) Cashman, Director of Ka Papa Lo'i 'O Kānewai, who shared the importance of Mānoa Stream to the Kānewai lo'i. In 2020, members of this Project Team conducted a similar site visit and talk-story with Hiapo Cashman, who reiterated the importance of maintaining consistent water quality and flow from Mānoa Stream located directly below the Project site to the

Kānewai lo'i<sup>2</sup>. Mr. Cashman affirmed the significance and connection of Mānoa Stream flows into the Kānewai lo'i that sustains the lo'i kalo. Mr. Cashman noted there are regularly scheduled community workdays at Kānewai lo'i where volunteers help to clean debris, maintain the awuwai, and maintain the lo'i kalo. The sustainability and maintenance of Kānewai lo'i not only continues to support a traditional and customary practice but it also supports contemporary Hawaiian practices related to lo'i kalo.

### 3.2.1 Impacts and Mitigation

The Project Site was historically used for agriculture, mainly kalo cultivation in lo'i and inland fishponds and for scattered human habitation dating back into the pre-European Contact and Historic periods. The Proposed Action will not impact traditional and cultural practices as there are no known sacred sites or cultural resources known to occur on-site. The following BMPs will be used to avoid impacts on Mānoa Stream that would affect Ka Papa Lo'i 'O Kānewai located downstream within the area of potential effect:

- Participation of the Developer's Development team and General Contractor team in a Ka Papa Lo'i 'O Kānewai community work day;
- Conduct cultural resources training as a component of safety training for subcontractors prior to working onsite;
- The Developer will conduct an Archaeological Inventory Survey (AIS) with subsurface testing during the demolition phase of the existing buildings in consultation with SHPD;
- The Developer will consult with SHPD concerning archaeological testing prior to initiating an AIS. If during the consultation SHPD determines that an AIS must be done prior to demolition the Developer will comply;
- Utilize BMPs to protect Mānoa Stream to avoid impacts to Ka Papa Lo'i 'O Kānewai; and;
- Developer will coordinate water quality monitoring of Mānoa Stream entering the lo'i with Ka Papa Lo'i 'O Kānewai during construction.

### 3.3 ARCHAEOLOGICAL RESOURCES

An Archaeological Literature Review and Field Inspection (ALRFI) report (attached as Appendix C) was prepared by Scientific Consultant Services, Inc. (SCS), pursuant to HAR §13-275 and the following is a summary of the findings. Previously conducted archaeological

---

<sup>2</sup> CSH's 2007 CIA recommended consultation with the Hawai'i inuiākea School of Hawaiian Knowledge and its Director on any plans for future improvements, alterations or development in or adjacent to Kānewai lo'i. Even though the property is not directly adjacent to the lo'i, Dr. Jon Osorio, Dean of Hawai'i inuiākea School of Hawaiian Knowledge, was provided information regarding the Proposed Action and invited to the site visit. While he accepted the invitation, on the day of the site visit he was unable to join the site visit.

studies and historical research were used to assess prior land use and identify existing archaeological and cultural resources at the Project Site.

Because of the land uses in Mānoa Valley during the pre-European Contact, Historic and post-European Contact periods, multiple archaeological studies conducted on and near the UHM campus have documented the presence of archeological historic properties, including human skeletal remains as single and clustered burials (see Figure 3-1 and Figure 3-2). Table 3-1 provides a list of the previous archaeological studies conducted in the surrounding area and summary of findings. The proximity of these burials to the Project Site, as well as evidence of past agricultural and settlement uses indicates there is potential for subsurface archaeological deposits (including possible human burials) to be present on-site (see Table 3-1).

**Table 3-1: Summary of Previous Archaeological Studies**

Reference	Location	Description and Results (SIHP # 50-80-14-XXXX)
Ching 1968	Former Magoon property given to UH Mānoa	A possible unnamed heiau consisting of two rock structures were observed. One rock structure was a linear rock mound and the other rock structure was a platform. Site was designated as SIHP # -3874
Barrera 1985	Mānoa Hillside	Documented an old road, no SIHP number assigned
Bath et al. 1988	2030 Wilder Avenue	Partially disturbed burial removed, designated as SIHP # -4038
Smith & Kawachi 1989	UH Mānoa near Keller Hall	Identified human remains, designated as SIHP # -4191
Douglas 1990	UH Mānoa near Keller Hall	Identified human remains from previously identified SIHP # -4191, determined to represent a single adult male
Hammatt & Shideler 1991	Kānewai	18 human skeletal remains found offsite on Dole Street, designated as SIHP # -4266
Liston & Burtchard 1996	Hawaiian Studies Institute	Paleoenvironmental sampling and stratigraphic profiling at Mānoa Stream identified a prehistoric irrigation system carbon dated to AD 1443-1681 at Ka Papa Lo'i 'O Kānewai, designated as SIHP # -4498
Wolforth & Haun 1996	Mānoa	Identified numerous historic buildings within the UH Mānoa campus, including the Kānewai Cultural Garden (SIHP # -1252) and agricultural terraces and walls along Wa'ahila Ridge (SIHP # -5463)



Tomonari-Tuggle 1998	National Marine Fisheries Service Laboratory (current Project Site)	Archaeological Assessment, recommended subsurface testing or archaeological monitoring for future ground-disturbing activities within the Project Site
O'Hare et al. 2007	Kamehameha Schools University parcels and Varsity Theatre	A literature review and field inspection identified previous agricultural use of the area
Shideler & Hammatt 2008	UH Mānoa Campus	A literature review and field inspection identified previously recorded sites within the campus [SIHP #s -1252 (architectural sites), -4191 (burial), -4498 (agricultural features), the Koana Cave and the site of Hipawai Heiau]
Enanoria et al. 2016	Varsity Parcels	Identified wetland soil deposits (SIHP #s -7588 and -7667) and early to mid-twentieth century structural remnants (SIHP # -7670)

Figure 3-1: Previous Archaeological Studies Map

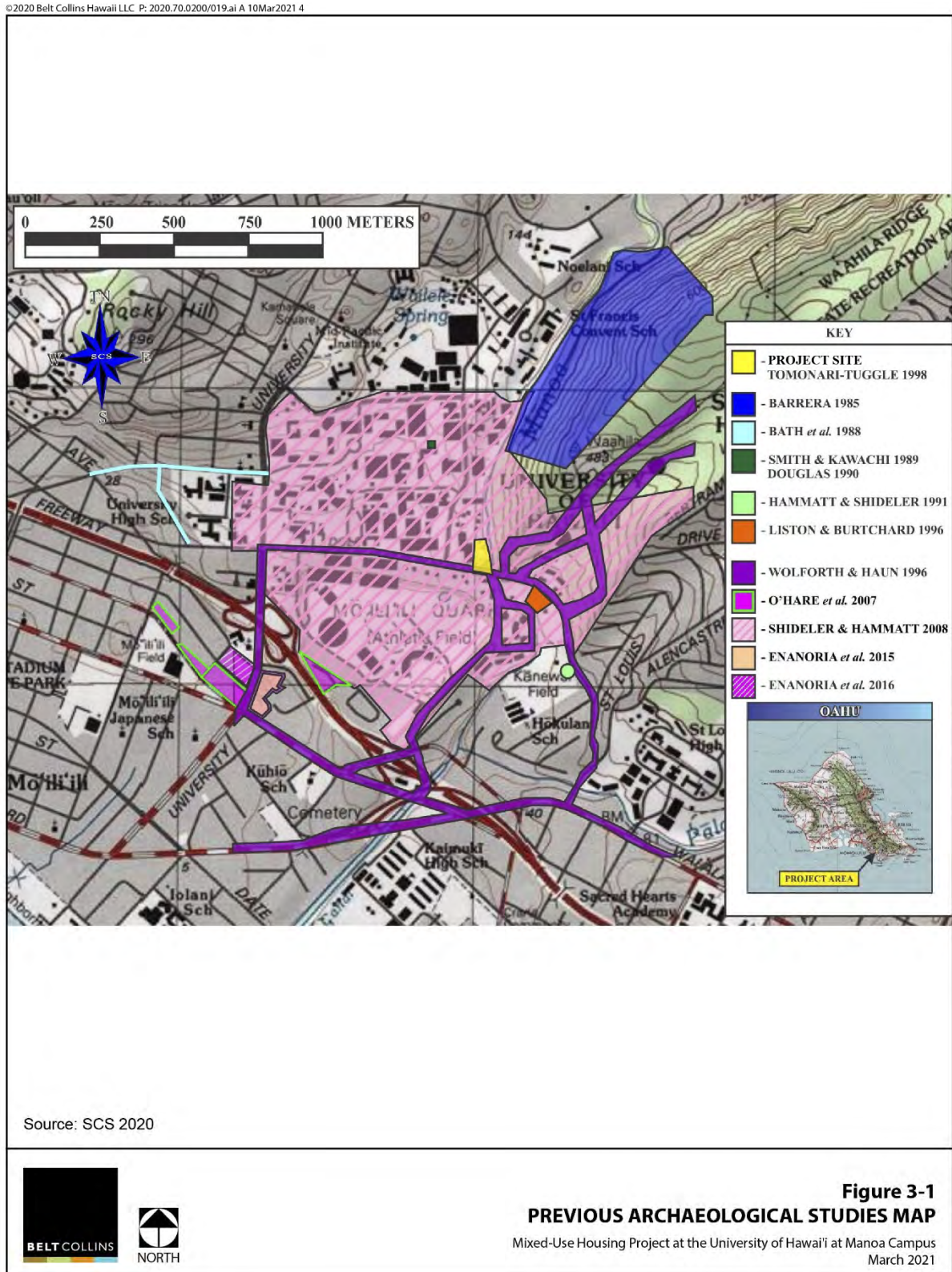
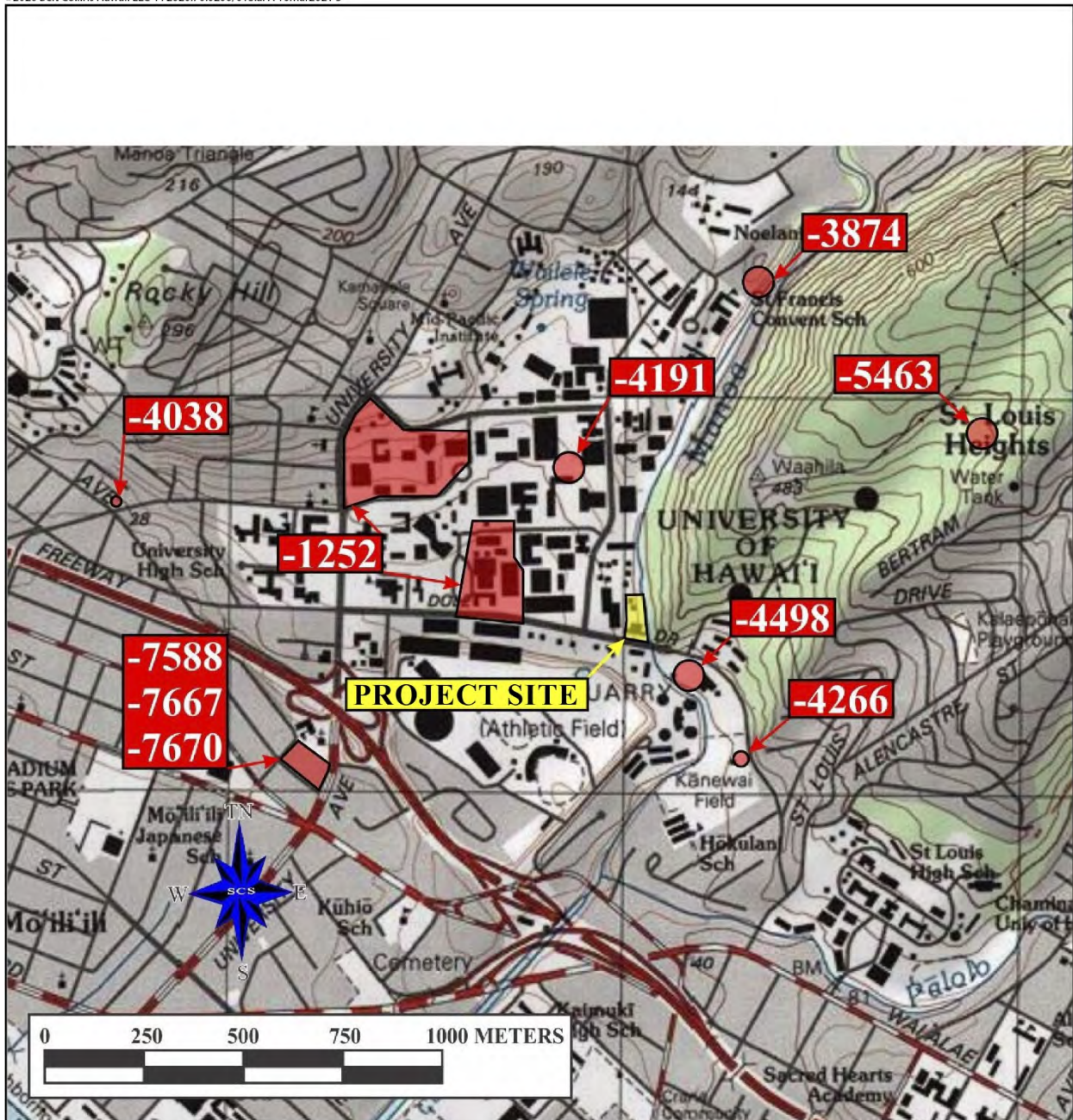




Figure 3-2: Historic Properties Map

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/013.ai A 10Mar2021 5



Source: SCS 2020

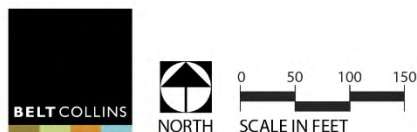


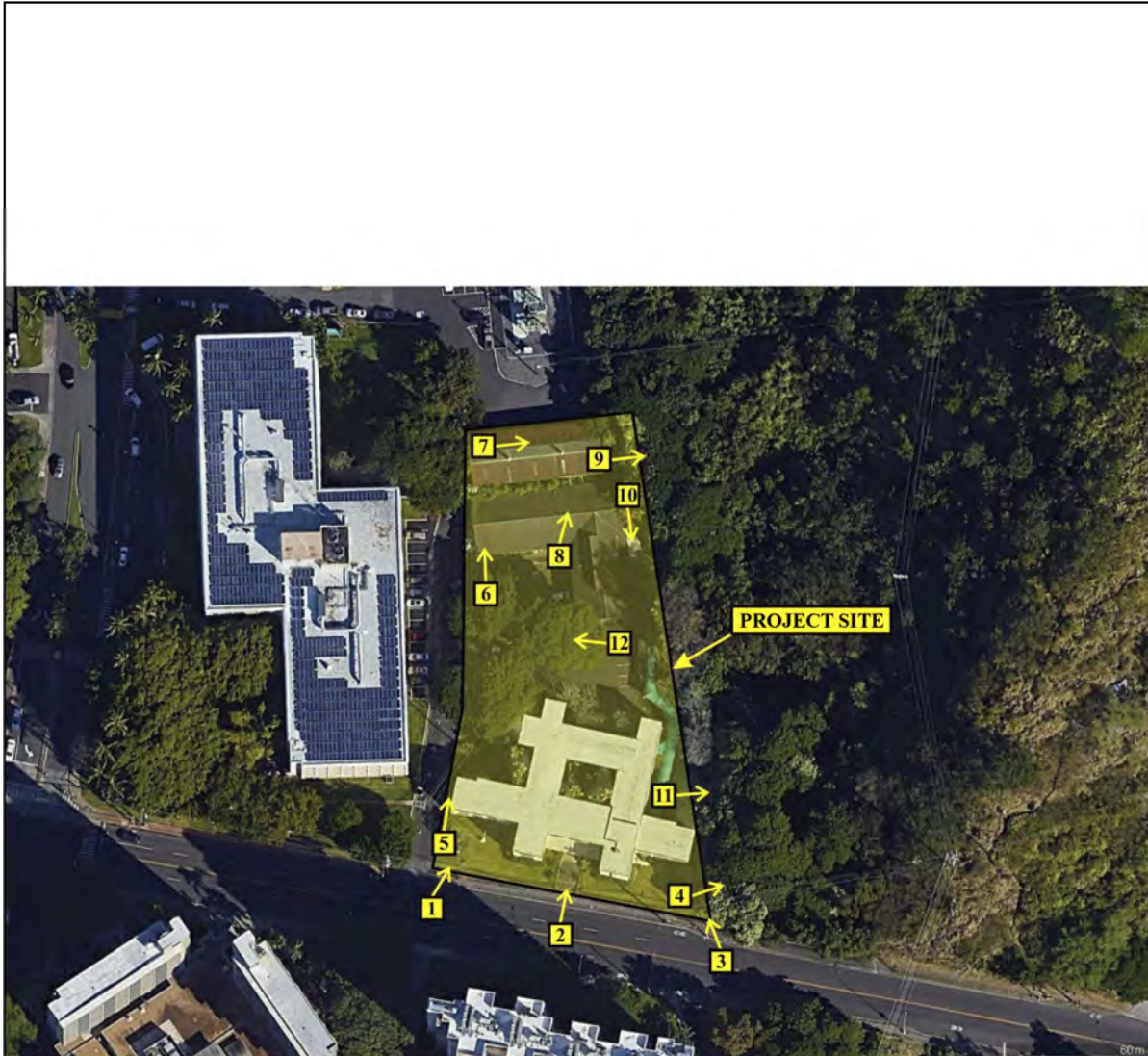
Figure 3-2  
HISTORIC PROPERTIES MAP

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021



Figure 3-3: Field Inspection Photo Map

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/020.ai A 10Mar2021 4



Source: SCS 2020

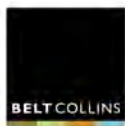


Figure 3-3  
FIELD INSPECTION PHOTO MAP

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021

### **3.3.1 Impacts and Mitigation**

Due to the presence of human burials near the Project Site, there is potential for subsurface archaeological deposits to be present. In order to minimize any potential impact on these resources, the following mitigation methods are recommended:

- Conduct an Archaeological Inventory Survey (AIS) with subsurface testing during the demolition phase of the existing buildings in consultation with SHPD; and,
- Consult with SHPD concerning archaeological testing prior to initiating an AIS. If during the consultation SHPD determines that an AIS must be done prior to demolition the Developer will comply.

*(This page intentionally left blank)*



## **4 PUBLIC RESOURCES**

### **4.1 EMERGENCY SERVICES**

#### **4.1.1 Honolulu Fire Department**

Fire services at the Project Site would be provided by the City and County of Honolulu Fire Department (HFD). Several fire stations are located in close proximity to the UHM campus, including the Mānoa Fire Station (1.4 miles), Makiki Fire Station (1.9 miles) and McCully Fire Station (1.4 miles). The Project Site is located between the Upper Campus and Lower Campus, and easily accessible by public roadways wide enough to permit access by fire trucks. Fire truck access is provided along Dole Street and at the entrance to the driveway. Fire hydrants are located within 400 ft of the nearest point on the building.

##### **4.1.1.1 Impacts and Mitigation**

The Proposed Action would be built in accordance with the Uniform Fire Code, as amended by the City. A fire protection system would be installed in the building, including an automatic fire sprinkler system, smoke detection system, heat detection system, carbon dioxide-based automatic fire suppression system, manual fire extinguishers, audio/visual signaling devices and fire alarm system. A dry standpipe system would be provided at the emergency exit stairwell and other areas as required by the Uniform Fire Code. No short- or long-term significant impacts to fire services are anticipated, and no additional mitigation is required.

#### **4.1.2 Honolulu Police Department**

Police services would be provided by the City and County of Honolulu Police Department (HPD). The UHM campus falls within District 7 – East Honolulu, Sector 1, which is served by the Alapa'i Police Headquarters, located approximately three miles west of the Project Site. Other stations within close proximity to the UHM campus include the Waikīkī Substation (3 miles) and Downtown Substation (3.5 miles).

##### **4.1.2.1 Impacts and Mitigation**

The Proposed Action may require the use of flagmen or off-duty police officers to direct traffic and emergency vehicles to minimize the potential disturbance of construction activities to traffic flow. The Developer would be responsible for communicating and scheduling HPD support during the construction schedule as necessary. The Developer would also be responsible for using necessary safety devices (e.g. signs, lights, barricades, etc.) during construction to ensure public safety. No short- or long-term significant impacts are anticipated, and no additional mitigation is required.

During the Draft EA public review period, HPD recommended implementing clearly defined crosswalks and brighter lighting for students, faculty and their families traversing the area. It is also acknowledged that HPD has concerns about security in the area with the introduction of 400 residential units and additional retail. However, unlike a similar project elsewhere on the island, the University has a campus security force to supplement HPD services.

### **4.1.3 University Department of Public Safety**

Security services would be provided by the UHM Department of Public Safety (DPS). DPS is responsible for providing ground surveillance, safety escort and incident response services across the UHM campus 24 hours a day, 365 days a year. DPS also provides specialized services such as incident management, victim and survivor assistance, emergency preparedness plans, security assessments, specialized trainings, outreach programs and special event support.

#### **4.1.3.1 Impacts and Mitigation**

The Proposed Action would not create a significant increase in demand on DPS services on the UHM campus. No short- or long-term significant impacts are anticipated, and no additional mitigation is required.

### **4.1.4 University Health Services**

Medical services are offered on-campus through the University Health Services Mānoa (UHSM) of the Office of Student Affairs. The UHSM is staffed by physicians, nurse practitioners, nurses, nutritionists, pharmacists, laboratory technicians and other support staff. Services and programs include: General Medicine; Specialized Clinics, such as women's health, sport's medicine, psychiatry, dermatology and nutrition; Pharmacy and Laboratory Services; Health Promotion Program; and student training, employment and volunteer opportunities.

The UHSM Health Promotion Program is located at the Queen Lili'uokalani Center for Student Services. The Health Promotion Program provides services to assist students, faculty and staff in maintaining and improving their health and well-being and to contribute to a healthy campus community. Activities range from health fairs and classroom presentations by peer educators, to mass media educational campaigns, to providing resource materials and individual counseling on health-related topics, including alcohol and other drugs.

#### **4.1.4.1 Impacts and Mitigation**

The Proposed Action would not create a significant increase in demand on UHSM services. No short- or long-term significant impacts are anticipated, and no additional mitigation is required.

#### **4.1.5 Honolulu Emergency Services Department**

Emergency medical services would be provided by the Emergency Medical Services (EMS) Division of the City and County of Honolulu Emergency Services Department. The UHM Campus is served by District 2, which includes the southeast region of O‘ahu. The EMS, in coordination with the HFD, would be responsible for responding to medical emergencies on- and off-campus.

After-hour care, private medical facilities and emergency response facilities are located within close proximity to the UHM Campus. The closest hospital is Kapi‘olani Medical Center for Women and Children, located approximately 1.5 miles west of the Project Site on Punahou Street. Other facilities within close vicinity include Kaiser Permanente, Kuakini Medical Center, Queen’s Medical Center, Saint Francis Medical (Honolulu) and Straub Medical Center.

#### **4.1.5.1 Impacts and Mitigation**

The Proposed Action would not create a significant increase in demand in emergency services already responding to the UHM campus and surrounding neighborhoods. The Proposed Action is not expected to increase the student population, but instead provide a centralized “live-work-play” environment that would create more direct access to the existing students and faculty population using these services. No short- or long-term significant impacts are anticipated, and no additional mitigation is required.

## **4.2 PUBLIC FACILITIES**

### **4.2.1 Education**

The Project Site is located within the Hawai‘i State Department of Education’s (DOE) Kaimukī-McKinley-Roosevelt Complex Area, which currently includes nineteen elementary schools, five middle schools, three high schools, five charter schools, two special schools and two community schools. The nearest public-school facilities include Kaimukī High School, Voyager Public Charter School, Noelani Elementary School and Hōkūlani Elementary School all located within approximately two miles of the Project Site.

UHM is one of ten campuses, including three universities and seven community colleges or community-based learning centers, that offer learning, training and research opportunities within the State’s public-school system for higher education. The University of Hawai‘i



System is considered to be one of the State’s leading engine for economic growth and diversification, by stimulating the local economy with jobs, research and skilled workers.<sup>3</sup>

#### 4.2.1.1 Impacts and Mitigation

While there is potential the Proposed Action may result in additional students enrolling in the DOE’s Kaimukī-McKinley-Roosevelt Complex Area schools, it is anticipated any additional enrollment would be minimal and should not affect current operating capacities. The housing project is intended to serve graduate students and junior faculty; therefore, it is unlikely a substantial number of the proposed rental units would be occupied by families or individuals with school-aged children.

Further, in addition to the schools discussed above, there are five private schools (Mid-Pacific Institute, Punahou, Maryknoll, Saint Louis and Sacred Hearts Academy) and two Native Hawaiian immersion schools (Ke Kula Kaiapuni ‘o ‘Ānuenue and Hālau Kū Māna Public Charter School) and one charter school (the University Laboratory Public Charter School) servicing grades K-12 located in the vicinity of the Proposed Action. These facilities would help to further offset the additional need for classroom space in public schools which are currently at capacity at this time.

#### 4.2.2 Recreation

A county park offering recreational facilities is in close proximity to the Project Site and operated and managed by the City and County of Honolulu Department of Parks and Recreation (DPR). Along with general park management and maintenance, the DPR offers various recreation and community programs to the community, including culture and arts, arts and crafts, sports, aquatics, therapeutic recreation, senior citizen and special event programs.<sup>4</sup> UHM falls within District 1: East Honolulu. The closest facility is Kānewai Community Park, a public recreation complex with softball fields, basketball and tennis courts and an outdoor lap pool, located approximately 0.3 miles southwest of the Project Site along Dole Street. Other facilities within close proximity include Kamānele Square, Kalo Place Mini Park and Kalaepōhaku Neighborhood Park (Manoa District Park) (see Figure 4-1 Figure 4-1: Map of Nearby Facilities and Services).

Recreational programs offered at UHM are managed by Student Recreation Services (SRS), which provides a spectrum of experiences for students, faculty and UH workforce through innovative recreational activities and services. Specific programs available to the UHM community include informal recreation, intramural sports, group exercise training (G.E.T. Fit), special programs (S.P. Fit) and outdoor education programs. The UHM Warrior Recreation Center is located approximately 0.6 miles from the Project Site on Campus Road.

<sup>3</sup> <https://www.hawaii.edu/about-uh/> (UH 2020)

<sup>4</sup> <http://www.honolulu.gov/parks/default/about-us.html> (CCH DPR, 2020)

Other facilities used for UHM sports and student recreation and fitness programs include the Stan Sheriff Center, UH Tennis Complex, Clarence T.C. Ching Complex, Duke Kahanamoku Aquatic Complex, Les Murakami Stadium, Rainbow Wahine Softball Stadium, Aloha Stadium and Waipi‘o Peninsula Soccer Stadium.<sup>5</sup>

#### 4.2.2.1 Impacts and Mitigation

The Proposed Action would allow students and faculty to enjoy a “live-work-play” environment that offers easier access to the services and facilities available within the vicinity of the Project Site. No short- or long-term significant impacts are anticipated, and no additional mitigation is required.

### 4.3 INFRASTRUCTURE AND UTILITIES

#### 4.3.1 Water

Potable water at the Project Site is supplied by the City and County of Honolulu Board of Water Supply (BWS). There is currently one twelve-inch and one twenty-inch cast iron main located along Dole Street with a point of connection at the southwest corner of the existing NOAA facility. The water lateral extends from the main building point of connection to the structure located on the north side of the parking lot. Both structures are served by a two-inch water meter #00700836 located within the property line on Dole Street and within an unidentified easement area. The BWS premise ID is 4679857322 (*see* Figure 4-2 **Error! Reference source not found.**). There are three fire hydrants located within the vicinity of the Project Site. One is located across Dole Street in front of Gateway House. Another is located on the near side of Dole on the west side of East-West Road intersection. A third is located on the near side of Dole on the east side of Mānoa Stream.

#### 4.3.1.1 Impacts and Mitigation

The Proposed Action would incorporate improvements to the existing water infrastructure to accommodate the anticipated water demand on-site. The final project design would incorporate water system BMPs and mitigation measures that are consistent with LEED Silver Certification status. Final design and siting of water lines and connections would be determined during the design phase and submitted to BWS for review and approval. No short- or long-term significant impacts are anticipated, and no additional mitigation is required.

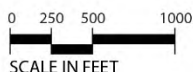
---

<sup>5</sup> [https://hawaiiathletics.com/sports/2015/6/9/GEN\\_0609152010.aspx](https://hawaiiathletics.com/sports/2015/6/9/GEN_0609152010.aspx) (UHM, 2020)



Figure 4-1: Map of Nearby Facilities and Services

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/010.ai A 10Mar2021 5

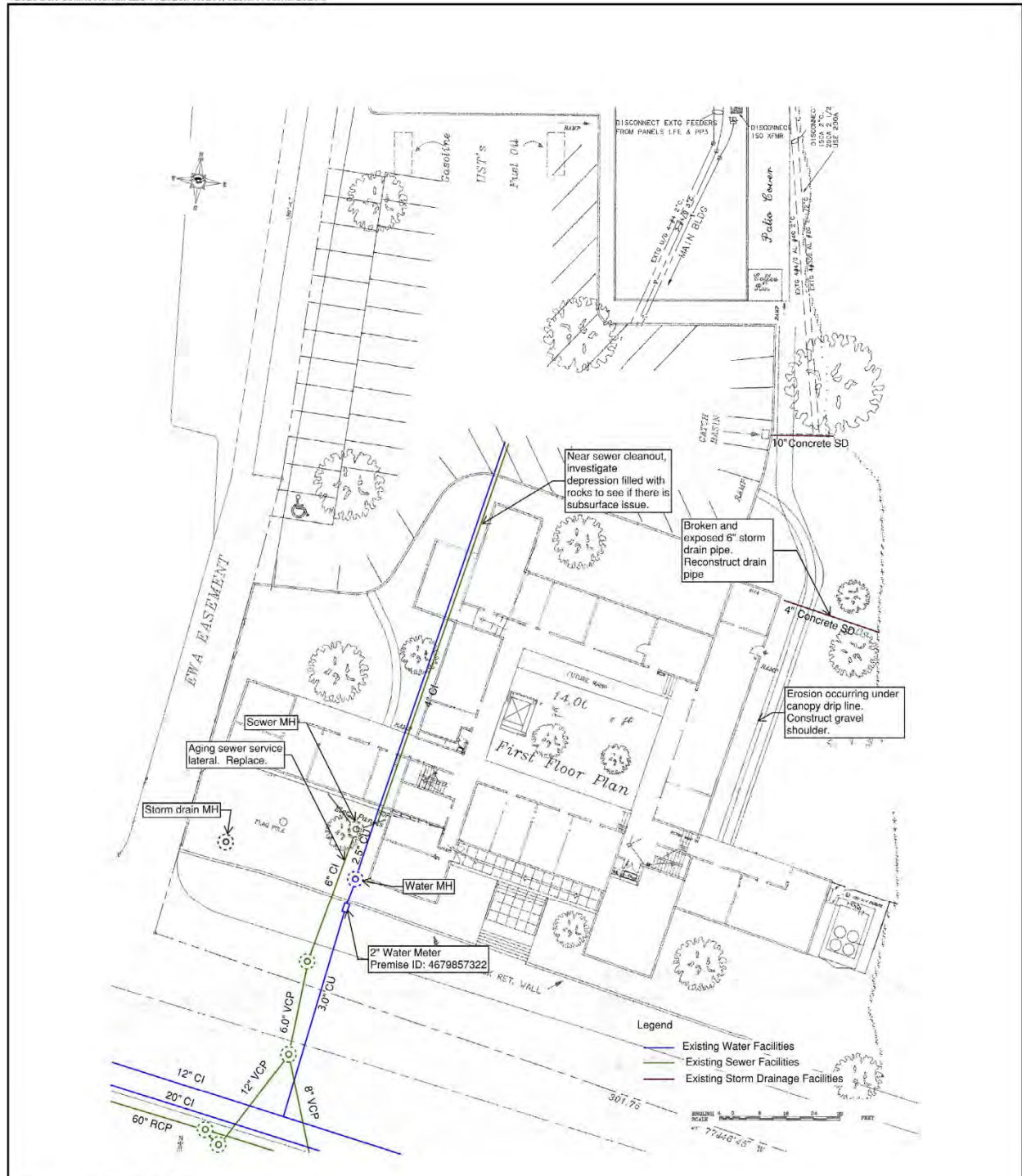


**Figure 4-1**  
**MAP OF NEARBY FACILITIES AND SERVICES**  
Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021



Figure 4-2: Civil Utilities Assessment Map

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/023.ai A 10Mar2021 5



Source: WCIT 2017



Figure 4-2  
CIVIL UTILITIES ASSESSMENT MAP

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021

### 4.3.2 Wastewater

Wastewater services at the Project Site are provided by the City and County of Honolulu Department of Environmental Services (ENV). There is currently one six-inch cast iron gravity sewer lateral constructed in 1950 that connects at the southwest corner of the existing building. The lateral connects to a gravity main crossing Dole Street, then to a sixty-inch gravity sewer main running parallel along Dole Street. The same lateral provides service upstream to the structure located on the north side of the parking lot. Sewer cleanouts were observed on both sides of the northwest corner of the building during previous assessments of the Project Site (see Figure 4-3). A sewer manhole is located at the southwest corner of the building.

#### 4.3.2.1 Impacts and Mitigation

The Proposed Action would incorporate improvements to the existing sewer lateral. Final improvements would be determined by the UHM Sewer Master Plan Update. The Project Site would remain within the total capacity allocated for wastewater infrastructure on the UHM campus. A Site Development Division Master Application Form for Sewer Connection will be submitted for the Project. No short- or long-term significant impacts are anticipated, and no additional mitigation is required.

### 4.3.3 Drainage

The existing drainage system includes multiple downspouts located around the perimeter of the existing building and two corners within the interior courtyard (see Photo 3 of Figure 4-3). The roof currently drains on the east side of the building and is piped underground to an outlet near the top of the embankment at Mānoa Stream (see Photo 9 of Figure 4-3). Two roof drains located near the entrance of the south side building are piped underground.

A drainage inlet located within the landscaped courtyard includes a drain box substructure with internal dimensions of approximately twelve-by-twelve ft (see Photo 6 of Figure 4-3). Another inlet located in the floor of the east walkway includes a vertical pipe, approximately six-inches in diameter. A storm drain inlet located in the parking lot includes a shallow curb that opens into a six-inch concrete pipe and outlets near the top of the embankment at Mānoa Stream (see Photos 8 & 9 of Figure 4-3). A storm drain manhole is located at the southwest corner of the property, partially exposed at the embankment.



Figure 4-3: Civil Utilities Assessment Photos

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/024.ai A 10Mar2021 3



Photo 3  
Downspout to underground



Photo 24  
Sewer Cleanout at Northwest Bldg. Corner



Photo 6  
Inlet in landscaped courtyard



Photo 7  
Inlet in east walkway



Photo 8  
Curb inlet in parking lot



Photo 9  
Curb inlet outlet pipe at embankment

Source: WCIT 2017



**Figure 4-3**  
**CIVIL UTILITIES ASSESSMENT PHOTOS**

Mixed-Use Housing Project at the University of Hawai'i at Manoa Campus  
March 2021



#### **4.3.3.1 Impacts and Mitigation**

The Proposed Action would incorporate improvements to the drainage system, including BMPs and mitigation consistent with LEED Silver Certification status, to accommodate the final project design. The Proposed Action would not alter the existing conditions of cross sections, slope or materials that would increase drainage to Mānoa Stream above current discharge levels. Water quality protection and pollution control would be implemented pursuant to HAR §11-54 and HAR §11-55. The Project's compliance with the City's "Rules Relating to Water Quality" and "Storm Drainage Standards" would be verified at the time that the grading/construction plans are submitted for review. No short- or long-term significant impacts are anticipated and no additional mitigation is required.

#### **4.3.4 Solid Waste**

Solid waste collection and disposal service is provided by the ENV for incineration at the Campbell Industrial Park H-POWER Plant.

##### **4.3.4.1 Impacts and Mitigation**

The Proposed Action would dispose of construction and demolition material at the PVT landfill in Wai'anae. Contractors would adhere to stringent BMPs to ensure no significant impact would occur to the surrounding area. No short- or long-term significant impacts are anticipated, and no additional mitigation is required.

#### **4.3.5 Power and Communications**

Electrical power on the island of O'ahu is provided by HECO. Telephone service is provided in the area by Hawaiian Telcom. The local Community Access Television service is provided by Spectrum Enterprise.

##### **4.3.5.1 Impacts and Mitigation**

The Proposed Action would have access to existing power and communication services in the area. The final project design would seek to implement new technologies and innovations in grid management that support UHM's commitment to reaching net-zero energy by 2035 and carbon neutrality by 2050. Increased storage opportunities and energy generation strategies would be incorporated into the building design to promote long-term energy efficiency on-site. Energy demand and usage would be comparable to existing housing facilities on the UHM campus. Residential and non-residential spaces at the Project Site would be metered separately. No short- or long-term significant impacts are anticipated, and no additional mitigation is required.

## 4.4 TRANSPORTATION AND CIRCULATION

### 4.4.1 Traffic

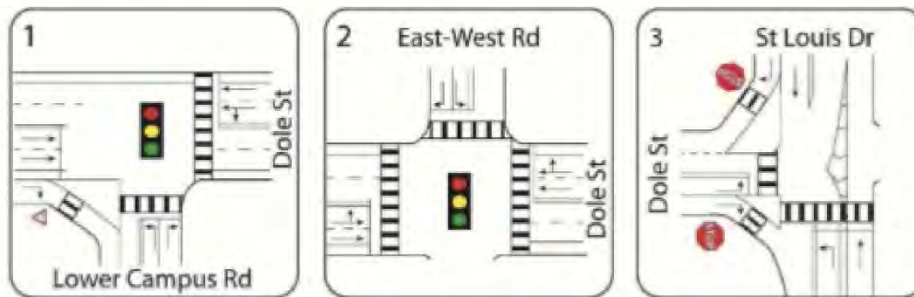
A Traffic Impact Report (TIR) was prepared by Wilson Okamoto to assess existing and anticipated traffic impacts from the Proposed Action (attached as Appendix E) and the following is a summary of the findings. The Project Site lies mauka (north) of Dole Street and is approximately 200 ft east of the Dole Street and East-West Road Intersection. The main roadway system surrounding the Project Site includes the following corridors (see Figure 4-4).

- Dole Street is a four-lane, two-way roadway oriented in the east-west direction at the makai (south) boundary of the Project Site;
- East-West Road is a two-lane roadway oriented in the north-south direction. The roadway is located west of the Project Site and provides access to UHM's Upper Campus at the intersection with Dole Street;
- Lower Campus Road is a three-lane, north-south oriented roadway. The roadway is located west of the Project Site and provides access to UHM's Lower Campus at the intersection with Dole Street. The eastbound approach of Dole Street has two through-lanes and an exclusive right-turn lane while the westbound approach has two lanes that serve left-turn and through traffic movements;
- St. Louis Drive is a two-lane, two-way north-south oriented roadway. The intersection between St. Louis Drive is located east of the property. The eastbound approach of Dole Street has an exclusive left-turn lane and an exclusive right-turn lane. At the intersection with Dole Street, the northbound approach of St. Louis Drive has an exclusive left-turn lane and one through lane, while the southbound approach has one through lane and an exclusive right-turn lane.

Traffic counts were conducted from April 18-23, 2019, during the morning peak hours, between 6:00 AM and 9:00 AM, and afternoon peak hours, between 3:00 PM and 6:00 PM. The analysis performed in this study was based upon the Highway Capacity Manual (HCM), Transportation Research Board (2000) and the "Synchro" software, developed by Trafficware. The Level of Service (LOS) was identified for each intersection ranging from LOS "A," meaning ideal or free-flow traffic operating conditions, to LOS "F," meaning unacceptable or potentially congested traffic operating conditions. Table 4-1 shows the existing operating conditions and projected operating conditions in 2025 with and without the Proposed Action. The analysis in this EA follows guidance from the State of Hawai'i Department of Transportation (DOT), which considers LOS "E" and "F" as unacceptable.

Figure 4-4: Existing Roadway System

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/006.ai A 10Mar2021.4



Source: Wilson Okamoto



Figure 4-4  
EXISTING ROADWAY SYSTEM

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021



**Table 4-1: Summary of Traffic Impact Analysis**

Intersection	Critical Movement	AM			PM		
		Exist Cond.	2025 w/out Project	2025 w/ Project	Exist Cond.	2025 w/out Project	2025 w/ Project
Lower-Campus Rd/ Dole St	Eastbound	A	A	A	A	A	A
	Westbound	A	A	A	A	A	A
	Northbound	B	B	B	B	B	B
East-West Rd/ Dole St	Eastbound	A	A	A	B	B	B
	Westbound	B	B	B	C	C	C
	Southbound	B	C	C	B	B	B
St. Louis Dr/ Dole St	Eastbound	D	D	D	E	E	E
	Northbound (*LT)	B	B	B	A	A	A

\*LT = Left Turn

The LOS analysis for each intersection is summarized as follow:

- Lower-Campus Road/Dole Street: Existing AM and PM conditions are considered acceptable for eastbound and westbound traffic (LOS A), and northbound traffic (LOS B).
- East-West Road/Dole Street: Existing AM and PM conditions are considered acceptable from all traffic directions, ranging from LOS A, B and C.
- St. Louis Drive/Dole Street: Existing conditions for eastbound traffic are considered acceptable at LOS D during the AM peak period, but unacceptable at LOS E during the PM peak period due to a high volume of right-turning vehicles from the stop-controlled approach. Existing AM and PM conditions are considered acceptable for northbound traffic (LOS A and B).

#### 4.4.1.1 Impacts and Mitigation

Projected traffic operating conditions under the Traffic Study’s No Action scenario (2025 w/o Project) were anticipated to remain generally consistent with the conditions under the Proposed Action (2025 with Project) and are summarized in the following:

- Lower-Campus Road/Dole Street:
  - Under the No Action scenario, traffic conditions are expected to continue operating at LOS A in both eastbound and westbound directions for AM and PM conditions and LOS B in the northbound direction for both peak periods.
  - The traffic conditions under the Proposed Action will remain the same as under the No Action scenario. No significant impacts are anticipated, and no mitigation measures are required.

- East-West Road/Dole Street:
  - Traffic operating conditions under the No Action scenario are expected to continue operating at LOS A in the eastbound direction during the AM period and at LOS B for the PM period. Westbound traffic conditions remain the same at LOS B for the AM period and LOS C for the PM period. The traffic conditions decrease from a LOS B to LOS C for the southbound direction in the AM period and remains at LOS B for the PM period.
  - Likewise, traffic conditions under the Proposed Action will operate similarly under the No Action Scenario. Southbound traffic conditions are also expected to lower from a LOS B to LOS C during the AM period, however it is anticipated that there will be no significant impact as conditions will operate similarly without the project. No additional mitigation is required.
- St. Louis Drive/Dole Street:
  - The traffic conditions are expected to remain at LOS D for the eastbound direction during the AM period and LOS E for the PM period, and a LOS B in the AM period and LOS A in the PM period in the northbound direction under the No Action Scenario.
  - Traffic conditions under the Proposed Action will remain the same with existing conditions as under the No Action scenario. The St. Louis and Dole Street intersection is expected to operate at LOS D and LOS E during AM and PM periods in the eastbound direction with the Proposed Action; however, it is anticipated that there will be no significant impacts as the current conditions as well as projected conditions in the No Action scenario operate on these LOS ratings. No mitigation measures are anticipated.

The Proposed Action would not contribute significant traffic demand to the surrounding intersections. According to the 2007 LRDP and 2012 Transportation Demand Management Plan (TMDP), it is expected that the volume of vehicles within the vicinity of the Project Site is expected to decrease as future improvements are made to multi-modal transportation systems and facilities across the UHM campus (UHM 2007 and UHM 2009). The project location and design would contribute long-term positive impacts to traffic demand by providing a “live-work-play” environment for students and faculty.

#### **4.4.2 Access and Circulation**

The sole accessway onto the Project Site is through an existing driveway off Dole Street which serves as both site access and egress. The driveway provides access to a parking lot that is currently utilized for visitors or permitted parking by UHM.

#### 4.4.2.1 Impacts and Mitigation

The Proposed Action will incorporate new access points for pedestrian and bicycle access on-site. ~~No changes are anticipated for the existing driveway.~~ The proposed housing facility is designed to promote multi-modal transportation and decrease commuting and parking demand on the UHM campus. The Proposed Action will incorporate the following recommendations to mitigate potential concerns related to multi-modal transportation access and circulation on-site:

- Maintain sufficient sight distance for motorists to safely enter and exit the project driveways to enhance pedestrian, bicyclist and motorist awareness at potential conflict points.
- Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.
- Provide adequate turn-around area for service, delivery and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto public roadways.
- Provide sufficient turning radii within all driveways to avoid or minimize vehicle encroachments to oncoming traffic lanes.
- Provide adequate signage to indicate the designated uses of on-site parking stalls and monitor stall usage to minimize potential conflicts.
- Provide convenient access to bicycle parking facilities located within the housing facility.
- Coordinate with the City and County of Honolulu's Department of Transportation Services regarding their plans for additional bike facilities along Dole Street and East-West Road.
- Prepare a Transportation Management Plan for the Project Site to determine specific traffic and circulation mitigation measures implemented on-site.
- Prepare a Construction Management Plan for the Project Site to determine operational conditions associated with traffic circulation, traffic control, **construction scheduling and phasing**, and parking usage during the construction period.

No short- or long-term significant impact is anticipated, and no additional mitigation is required.

#### 4.4.3 Parking Facilities

Parking requirements for the UHM campus are established by the existing PRU, LRDP, and TMDP plans and policies, which aim to increase multi-modal transportation on campus by decreasing future supply and demand of UHM parking facilities (UHM 2009 and UHM 2012). According to the *Parking Supply/Demand Study & Site Alternatives Evaluation* (UHM 2007), the existing parking infrastructure would not be sufficient to support peak hour activities at



the Project Site (typically from 7:30 AM to 3:30 PM Mondays through Fridays). However, this is consistent with the objectives set forth in the LRDP.

#### 4.4.3.1 Impacts and Mitigation

The Proposed Action would prioritize on-site parking for short-term rideshare, carshare and childcare loading zones to promote multi-modal transportation objectives of the LRDP. No long-term parking will be provided for residents on-site as well as staff members, however alternative permit and visitor parking facilities are available on campus as needed (*see* Figure 4-5). UHM is currently in the process of planning and securing funds for a multi-level parking facility mauka of the Project Site. Current parking structures on campus and the addition of the future multi-level parking facility would mitigate any potential impacts of additional parking demands created by residents of the Proposed Action.

The Proposed Action is consistent with the objectives set forth in the LRDP to decrease parking demand and increase multi-modal transportation across the UHM campus. No short- or long-term significant impacts are anticipated, and no additional mitigation is required.

#### 4.4.4 Transit Facilities

Several transit services and facilities are located within the vicinity of the Project Site. The City and County of Honolulu’s public bus system, called “TheBus”, currently offers a total of four stops with eleven unique routes within a quarter mile radius of the Project Site (*see* Figure 4-6: Transit Facilities). The UHM “Rainbow Shuttle” offers additional transit services for students and faculty through the campus and surrounding neighborhoods, such as Mō‘ili‘ili and Koko Head Avenue. There are five Rainbow Shuttle stops within a quarter mile radius of the Project Site.

##### 4.4.4.1 Impacts and Mitigation

The Proposed Action would be one of several projects implemented to support UHM’s transportation and connectivity goals by creating a “live-work-play” environment for students and faculty on campus, with mechanisms to ensure pedestrian safety (refer to discussion in Section 4.1.2.1 above). The Project Site is located close to the new Transportation Management Center, which will serve as a transit hub with shuttle and bus accommodations, rideshare, carshare, bikeshare programs and more. The new housing facility will have a long-term positive impact on the utilization of on-campus transit facilities and infrastructure because it will reduce vehicular traffic in the area.

During the Draft EA public review period, DPP noted that “[t]he FEA should include specific proposals pertaining to the nearby bus stop, future location of a rail station and mechanisms to ensure pedestrian safety.” At this time, there are no specific proposals in place pertaining

to the nearby bus stop. To ensure pedestrian safety in the vicinity of the Proposed Action, the project team will continue to coordinate with DPP TRB, DTS and O'ahu Transit Services as the project's design progresses. Regarding the future location of a rail station, the UHM has coordinated with HART, DTS, and other City agencies on matters related to planning for the Honolulu Rail Transit project and Complete Streets. The University is supportive of rail and multi-modal access to the campus and will continue to work with DTS and HART on planning efforts to enhance multi-modal access for a possible future extension of the rail alignment to and/or in the vicinity of the UHM campus.

**Figure 4-5: Parking Facilities**



Source: University of Hawaii'i



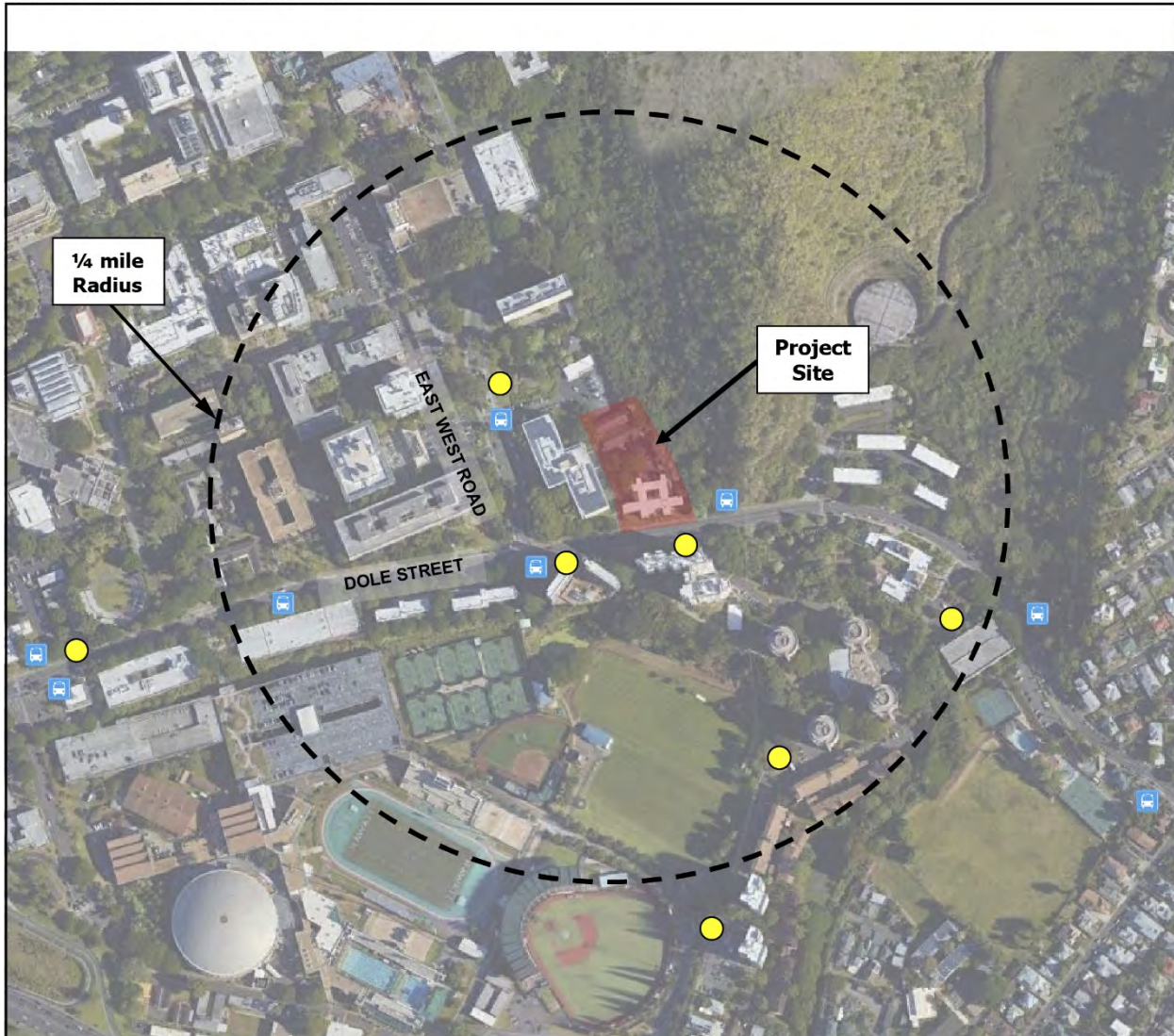
**Figure 4-5**  
**PARKING FACILITIES**

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
 March 2021



Figure 4-6: Transit Facilities

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/031.ai A 10Mar2021 4



Adjacent Bus Facilities	
<u>Bus Stop(s)</u>	<u>Bus Routes</u>
University Ave & Dole St	4, 6, 13, 18
Dole St & Lower Campus Rd	6, 18, 85, 80A, 85
East-West Rd & Dole St	6, 80

LEGEND	
	Bus Stop
	Rainbow Shuttle Stop

Source: Wilson Okamoto Corporation



**Figure 4-6**  
**TRANSIT FACILITIES**

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021

#### 4.4.5 Bicycle Facilities

Bicycle facilities located within the vicinity of the Project Site include bikeshare stations, short-term bike racks and long-term bike storage locations. The “Biki” bikeshare system, owned and operated by a nonprofit called Bikeshare Hawai‘i, offers several stations within a quarter mile of the Project Site. The nearest stations are located south of the Project Site along Dole Street, west of the Project Site along Dole Street, southwest of the Project Site at the Lower Campus parking structure, and north of the Project Site towards the center of campus (see Figure 4-7: Bicycle Facilities). Bicycle lanes extend across campus, connecting the Lower Campus and Upper Campus along Dole Street, University Avenue and East-West Road.

##### 4.4.5.1 Impacts and Mitigation

The Proposed Action will provide a total of 41 short-term and 164 long-term bicycle parking stalls for residents and visitors on-site to promote multi-modal transportation objectives of UHM’s LRDP (see Figure 4-8: Pedestrian Connectivity). Bicycle racks will offer short-term parking options near the south end of the Project Site, closest to Dole Street. Short-term bicycle parking stalls will be dispersed around the buildings in proximity to the different entrances. Of the 164 long-term stalls, 120 will be provided mauka of the buildings and the remaining 44 stalls will be provided on the ground or second floor of the housing facility for residents. The new housing facility will have a long-term positive impact on the utilization of bicycle transportation and facilities on campus.

#### 4.4.6 Pedestrian Connectivity

Pedestrian connectivity around the Project Site is achieved through a network of sidewalks, crosswalks, signal phases and curb ramps. A signalized mid-block crosswalk on Dole Street between Lower Campus Road and East-West Road connects the UHM parking garage and pedestrian pathway called the UHM “Legacy Path” (see Figure 4-8: Revised Pedestrian Connectivity). Trees and streetlights positioned along these roadways provide elements of safety and comfort, which enhances the pedestrian environment.

##### 4.4.6.1 Impacts and Mitigation

The Proposed Action will incorporate paving and landscaping that promotes pedestrian activity and connectivity on and around the Project Site. The Project Site will incorporate elements of lighting, shading, and seating to facilitate places of gathering that feel safe and comfortable for students, residents, faculty, and visitors creating a long-term positive impact on pedestrian connectivity across the UHM campus. In addition, pedestrian safety during construction is addressed in Section 4.1.2.1.

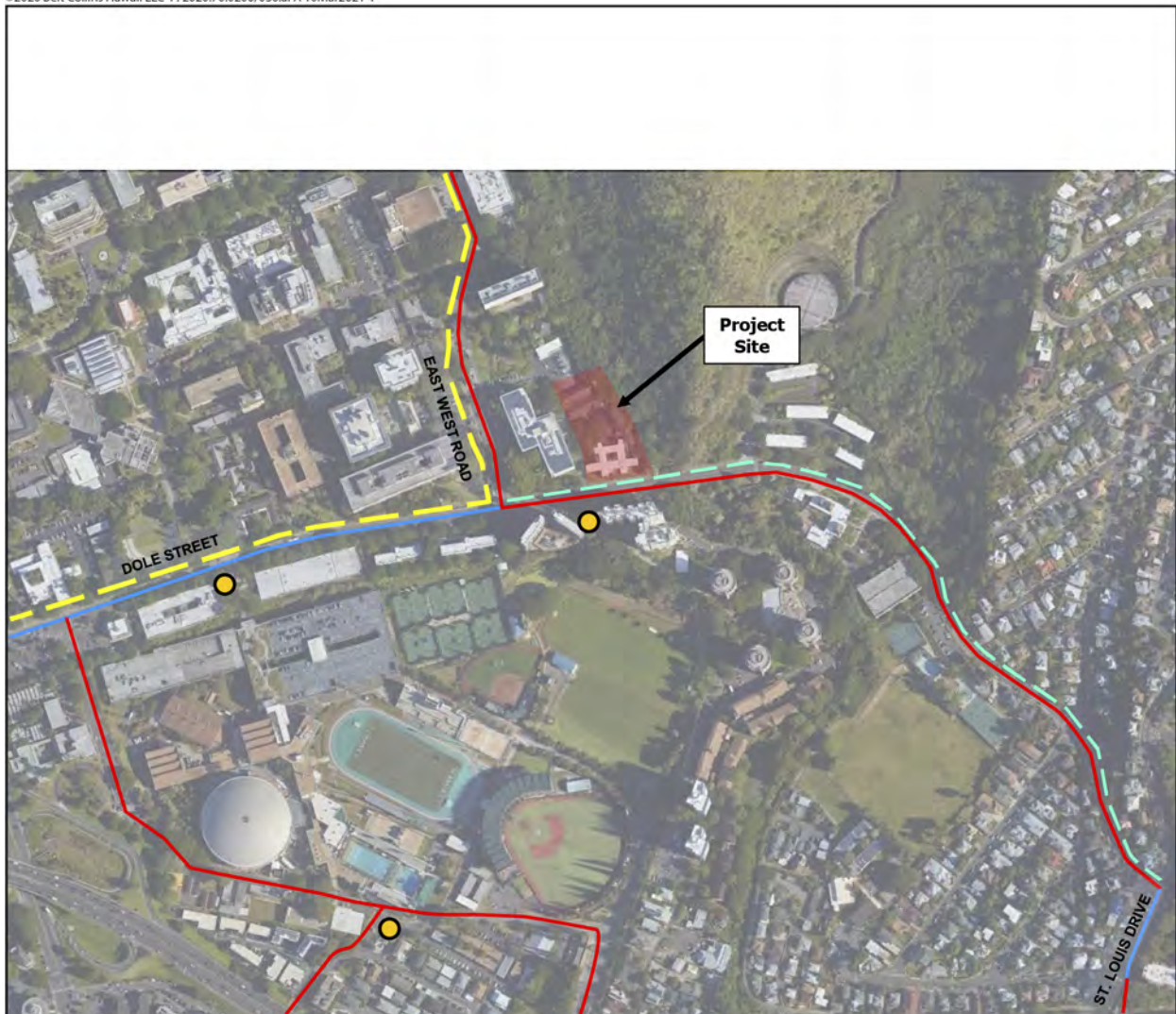
The “live-work-play” environment will support UHM’s LRDP objective to establish pedestrian gateways across campus, specifically along University Avenue, Maile Way, Dole Street and East-West Road. The Proposed Action is designed to encourage safe, multi-modal transportation using existing pedestrian, bicycle, and public transit systems in place throughout the UHM campus. The design of the Proposed Action is consistent with UHM’s LRDP objective to establish and encourage multimodal transportation by enhancing the existing pedestrian connectivity and providing additional bicycle parking facilities.

UHM supports additional Complete Streets designs in the vicinity of the Proposed Action, with regard to the campus’ overall transportation flow as part of the LRDP’s multimodal objective. For example, unrelated to this Proposed Action, UHM previously proposed a “scramble” crossing at the intersection of Dole Street and East-West Road to DTS. UHM remains open to that proposal.



Figure 4-7: Bicycle Facilities

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/030.ai A 10Mar2021 4



Source: Wilson Okamoto Corporation

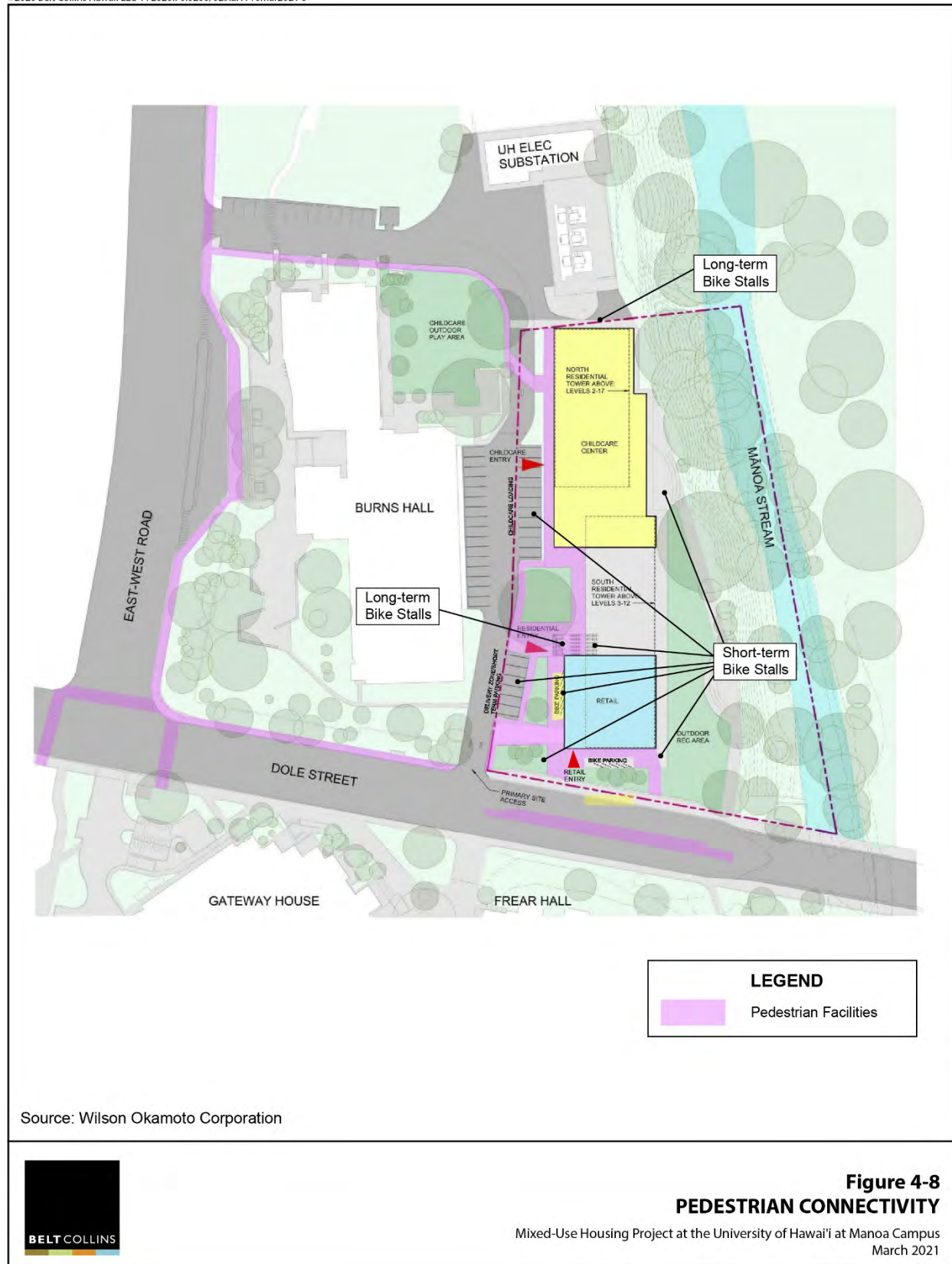


Figure 4-7  
BICYCLE FACILITIES

Mixed-Use Housing Project at the University of Hawaii at Manoa Campus  
March 2021

Figure 4-8: Revised Pedestrian Connectivity

©2020 Belt Collins Hawaii LLC P: 2020.70.0200/029.ai A 10Mar2021 6



Source: Wilson Okamoto Corporation



Figure 4-8  
PEDESTRIAN CONNECTIVITY

Mixed-Use Housing Project at the University of Hawai'i at Manoa Campus  
March 2021

*(This page intentionally left blank)*



## 5 RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

### 5.1 STATE OF HAWAII

#### 5.1.1 Hawai'i State Plan

The Hawai'i State Plan is a broad policy document that guides all activities, programs and decisions made by local and State agencies (DPED 1986). The purpose of the plan is to: (1) improve the planning process; (2) increase the effectiveness of government and private actions; (3) improve coordination among agencies and levels of government; (4) provide for the wise use of Hawai'i's resources; and (5) guide the future development of the state. Part I of the Plan references Overall Theme, Goals, Objectives and Policies while Part III references the Priority Guidelines. Because Part II pertains primarily to internal government affairs it is not applicable to the Proposed Action and was not addressed. Table 5-1 outlines the Proposed Action's consistency with Part I objectives. Table 5-2 outlines the consistency with Part III objectives.

**Table 5-1: Consistency with Hawai'i State Plan**

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
<b>HRS § 226-4: State Goals</b>			
<b>(a) Objectives:</b> In order to guarantee, for the present and future generations, those elements of choice and mobility that ensure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:			
<b>(1)</b> A strong, viable economy characterized by stability, diversity and growth that enables fulfillment of the needs and expectations of Hawai'i's present and future generations.	X		
<b>(2)</b> 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		
<b>(3)</b> Physical, social and economic well-being, for individuals and families in Hawai'i, that nourishes a sense of community responsibility, of caring and of participation in community life.	X		
<b>Discussion:</b> The Proposed Action would support State goals by fostering a unique and engaging "live-work-play" environment on the UHM campus that is <del>affordable, and therefore</del> accessible, for students and faculty. The physical environment would incorporate natural landscaping features and open gathering spaces to promote connectivity and participation in community life across campus. The Proposed Action would protect and preserve the integrity of Manoa Stream along the Project Site, while maintaining visual accessibility to the stream and surrounding scenic resources from key observation points in the surrounding area.			

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
<b>HRS § 226-5: Objectives and Policies for Population</b>				
<b>Objective:</b> It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic and social objectives contained in this chapter.				
<b>(a) Policies:</b>				
<b>(1)</b> Manage population growth statewide in a manner that provides increased opportunities for Hawai'i's people to pursue their physical, social and economic aspirations while recognizing the unique needs of each county.				X
<b>(2)</b> Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.				X
<b>(3)</b> Promote increased opportunities for Hawai'i's people to pursue their socio-economic aspirations throughout the islands.	X			
<b>(4)</b> Encourage research activities and public awareness programs to foster an understanding of Hawai'i's limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawai'i's population.				X
<b>(5)</b> 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
<b>(6)</b> Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state's population.				X
<b>(7)</b> 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
<b>Discussion:</b> The Proposed Action would support population growth and mobility. Affordable On-campus housing developments increase opportunities for <del>low income residents</del> students to pursue higher education without the cost barriers associated with rent and transportation.				
<b>HRS § 226-6: Objectives and Policies for the Economy in General</b>				
<b>Objectives:</b> Planning for the State's economy in general shall be directed toward achievement of the following objectives:				
<b>(1)</b> Increased and diversified employment opportunities to achieve full employment, increased income and job choice and improved living standards for Hawai'i'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
<b>(2)</b> 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
<b>(a) Policies:</b>				

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
(1)	Promote and encourage entrepreneurship within Hawai'i by residents and nonresidents of the State.			X
(2)	Expand Hawai'i'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 Hawai'i as an attractive market for environmentally and socially sound investment activities that benefit Hawai'i's people.			X
(4)	Transform and maintain Hawai'i 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 Hawai'i.	X		
(6)	Seek broader outlets for new or expanded Hawai'i business investments.			X
(7)	Expand existing markets and penetrate new markets for Hawai'i's products and services.			X
(8)	Assure that the basic economic needs of Hawai'i'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 Hawai'i'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 Hawai'i.	X		
(13)	Foster greater cooperation and coordination between the government and private sectors in developing Hawai'i'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 Hawai'i's workers.	X		
(16)	Provide equal employment opportunities for all segments of Hawai'i'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 Hawai'i's economy, particularly with respect to emerging industries in science and technology.			X



HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
(19) Promote and protect intangible resources in Hawai'i, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.	X		
(20) Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general and requirements of new, potential growth industries in particular.	X		
(21) Foster a business climate in Hawai'i - 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
<b>Discussion:</b> The Proposed Action would support the economy by leveraging private and public expertise and capital through a P3 partnership that would not otherwise be available. Construction of the proposed facility will provide and promote job opportunities and contribute to the economic growth and vitality of Hawai'i. Operation of the proposed facility will provide long-term job opportunities and incorporate space for community engagement and collaboration that promotes innovation and future growth. The Project Site will preserve and enhance scenic beauty and healthy living by promoting pedestrian and bicycle connectivity across the UHM campus.			
<b>HRS § 226-7: Objectives and Policies for the Economy–Agriculture</b>			
<b>Objectives:</b> Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:			
(1) Viability of Hawai'i'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 Hawai'i's strategic, economic and social well-being.			X
<b>(a) Policies:</b>			
(1) Establish a clear direction for Hawai'i'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 Hawai'i's economy.			X
(6) Seek the enactment and retention of federal and state legislation that benefits Hawai'i's agricultural industries.			X
(7) Strengthen diversified agriculture by developing an effective promotion, marketing and distribution system between Hawai'i's food producers and consumers in the State, nation and world.			X

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
(8) Support research and development activities that strengthen economic productivity in agriculture, stimulate greater efficiency and enhance the development of new products and agricultural by-products.			X
(9) Enhance agricultural growth by providing public incentives and encouraging private initiatives.			X
(10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.			X
(11) Increase the attractiveness and opportunities for an agricultural education and livelihood.			X
(12) In addition to the State's priority on food, expand Hawaii's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture and other potential enterprises.			X
(13) Promote economically competitive activities that increase Hawaii's agricultural self-sufficiency, including the increased purchase and use of Hawaii-grown food and food products by residents, businesses and governmental bodies as defined under HRS §103D-104.			X
(14) Promote and assist in the establishment of sound financial programs for diversified agriculture.			X
(15) Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.			X
(16) Facilitate the transition of agricultural lands in economically non-feasible agricultural production to economically viable agricultural uses.			X
<b>Discussion:</b> The Proposed Action does not affect the objectives and policies of for the economy-agriculture.			
<b>HRS § 226-8: Objectives and Policies for the Economy-Visitor Industry</b>			
<b>Objective:</b> Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaii's economy.			
<b>(a) Policies:</b>			
(1) Support and assist in the promotion of Hawaii's visitor attractions and facilities.			X
(2) Ensure that visitor industry activities are in keeping with the social, economic and physical needs and aspirations of Hawaii's people.			X
(3) Improve the quality of existing visitor destination areas by utilizing Hawaii's strengths in science and technology.			X
(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

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
(5)	Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawai'i's people.			X
(6)	Provide opportunities for Hawai'i'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 Hawai'i'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 Hawai'i's cultures and values.			X
<b>Discussion:</b> The Proposed Action does not affect the objectives and policies of the Economy-Visitor Industry.				
<b>HRS § 226-9: Objective and Policies for the Economy–Federal Expenditures</b>				
<b>Objective:</b> 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 Hawai'i's economy.				
<b>(a) Policies:</b>				
(1)	Encourage the sustained flow of federal expenditures in Hawai'i that generates long- term government civilian employment.			X
(2)	Promote Hawai'i's supportive role in national defense, in a manner consistent with Hawai'i's social, environmental and cultural goals by building upon dual-use and defense applications to develop thriving ocean engineering, aerospace research and development and related dual-use technology sectors in Hawai'i's economy.			X
(3)	Promote the development of federally supported activities in Hawai'i that respect state-wide economic concerns, are sensitive to community needs and minimize adverse impacts on Hawai'i's environment.			X
(4)	Increase opportunities for entry and advancement of Hawai'i's people into federal government service.			X
(5)	Promote federal use of local commodities, services and facilities available in Hawai'i.			X
(6)	Strengthen federal-state-county communication and coordination in all federal activities that affect Hawai'i.			X
(7)	Pursue the return of federally controlled lands in Hawai'i 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
<b>Discussion:</b> The Proposed Action does not affect the objectives and policies of the Economy-Federal Expenditures.				
<b>HRS § 226-10: Objectives and Policies for the Economy–Potential Growth and Innovative Activities</b>				



HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
<b>(a) Objective:</b> Planning for the State’s economy with regard to potential growth and innovative activities shall be directed towards achievement of the objective of development and expansion of potential growth and innovative activities that serve to increase and diversify Hawai‘i’s economic base.	X		
<b>(b) Policies:</b>			
<b>(1)</b> Facilitate investment and employment in economic activities that have the potential to expand and diversify Hawai‘i’s economy, including but not limited to diversified agriculture, aquaculture, renewable energy development, creative media, health care and science and technology-based sectors.			X
<b>(2)</b> 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 Hawai‘i through the export of services or products or substitution of imported services or products.			X
<b>(3)</b> 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
<b>(4)</b> 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
<b>(5)</b> 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
<b>(6)</b> Expand Hawai‘i’s capacity to attract and service international programs and activities that generate employment for Hawai‘i’s people.	X		
<b>(7)</b> Enhance and promote Hawai‘i’s role as a center for international relations, trade, finance, services, technology, education, culture and the arts.	X		
<b>(8)</b> Accelerate research and development of new energy- related industries based on wind, solar, ocean and underground resources and solid waste.			X
<b>(9)</b> Promote Hawai‘i’s geographic, environmental, social and technological advantages to attract new economic activities into the State.	X		
<b>(10)</b> Provide public incentives and encourage private initiative to attract new industries that best support Hawai‘i’s social, economic, physical and environmental objectives.	X		
<b>(11)</b> Increase research and the development of ocean-related economic activities such as mining, food production and scientific research.			X
<b>(12)</b> Develop, promote and support research and educational and training programs that will enhance Hawai‘i’s ability to attract and develop economic activities of benefit to Hawai‘i.			X

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
(13) Foster a broader public recognition and understanding of the potential benefits of new or innovative growth-oriented industry in Hawai'i.			X
(14) Encourage the development and implementation of joint federal and state initiatives to attract federal programs and projects that will support Hawai'i'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
<b>Discussion:</b> The Proposed Action would support opportunities for potential growth and innovation in the economy as a leading P3 partnership at UHM. The project design will promote and incorporate values of Hawai'i's unique social, economic, physical, and environmental setting and provide services that support economic growth through private investment.			
<b>HRS § 226-10.5: Objectives and Policies for the Economy–Information Industry</b>			
(a) <b>Objective:</b> 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 Hawai'i as a leader in broadband and wireless communications and applications in the Pacific Region.			X
<b>(b) Policies:</b>			
(1) Promote efforts to attain the highest speeds of electronic and wireless communication within Hawai'i and between Hawai'i and the world, and make high speed communication available to all residents and businesses in Hawai'i.	X		
(2) Encourage the continued development and expansion of the telecommunications infrastructure serving Hawai'i to accommodate future growth and innovation in Hawai'i's economy.	X		
(3) Facilitate the development of new or innovative business and service ventures in the information industry which will provide employment opportunities for the people of Hawai'i.			X
(4) Encourage mainland- and foreign-based companies of all sizes, whether information technology-focused or not, to allow their principals, employees or contractors to live in and work from Hawai'i, using technology to communicate with their headquarters, offices or customers located out-of-state.			X
(5) Encourage greater cooperation between the public and private sectors in developing and maintaining a well-designed information industry.	X		
(6) Ensure that the development of new businesses and services in the industry are in keeping with the social, economic and physical needs and aspirations of Hawai'i's people.	X		

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
(7)	Provide opportunities for Hawai'i's people to obtain job training and education that will allow for upward mobility within the information industry.	X		
(8)	Foster a recognition of the contribution of the information industry to Hawai'i's economy.	X		
(9)	Assist in the promotion of Hawai'i as a broker, creator and processor of information in the Pacific.	X		
<b>Discussion:</b> The Proposed Action would support the economy-information industry by making high speed communication available to residents of the new housing facility. As a P3 partnership, this project will serve as a model for cooperation between public and private sectors and encourage other mainland or foreign companies to pursue future business opportunities in Hawai'i.				
<b>HRS § 226-11: Objectives and Policies for the Physical Environment–Land-Based, Shoreline and Marine Resources</b>				
(a)	<b>Objectives:</b> Planning for the State's physical environment with regard to land-based, shoreline and marine resources shall be directed towards achievement of the following objectives:	X		
(1)	Prudent use of Hawai'i's land-based, shoreline and marine resources.			X
(2)	Effective protection of Hawai'i's unique and fragile environmental resources.	X		
(b)	<b>Policies:</b>			
(1)	Exercise an overall conservation ethic in the use of Hawai'i's natural resources.	X		
(2)	Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.	X		
(3)	Take into account the physical attributes of areas when planning and designing activities and facilities.	X		
(4)	Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.	X		
(5)	Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.			X
(6)	Encourage the protection of rare or endangered plant and animal species and habitats native to Hawai'i.	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
<b>Discussion:</b> The Project Site is located within Urban Land Use District on the UHM campus and the design is consistent with these standards. As part of the EA process, a flora and fauna survey was conducted. It determined that the Proposed Action may create minor short-term impacts to avian fauna found on-site during construction, however, these will only be temporary and have no long-				



HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
term effects. Mitigation measures recommended in the report were included in the EA to prevent any significant or long-term impacts on the Project Site's natural environment or resources.			
<b>HRS § 226-12: Objective and Policies for the Physical Environment–Scenic, Natural Beauty and Historic Resources</b>			
<b>(a) Objective:</b> Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawai'i's scenic assets, natural beauty and multi-cultural/historical resources.	X		
<b>(b) Policies:</b>			
<b>(1)</b> Promote the preservation and restoration of significant natural and historic resources.			X
<b>(2)</b> Provide incentives to maintain and enhance historic, cultural and scenic amenities.	X		
<b>(3)</b> Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes and other natural features.	X		
<b>(4)</b> Protect those special areas, structures and elements that are an integral and functional part of Hawai'i's ethnic and cultural heritage.	X		
<b>(5)</b> Encourage the design of developments and activities that complement the natural beauty of the islands.	X		
<b>Discussion:</b> The Proposed Action would support the objectives and policies for protecting scenic, natural, and historic beauty of the Project Site and surrounding area. The proposed design was selected to maximize the preservation of scenic resources and natural features. No historic properties or archaeological resources have been identified on-site, however an AIS will be implemented for all ground disturbing activities. The timing of the AIS will be based on 6-E consultation with SHPD.			
<b>HRS § 226-13: Objectives and Policies for the Physical Environment–Land, Air and Water Quality</b>			
<b>(a) Objectives:</b> Planning for the State's physical environment with regard to land, air and water quality shall be directed towards achievement of the following objectives:	X		
<b>(1)</b> Maintenance and pursuit of improved quality in Hawai'i's land, air and water resources.	X		
<b>(2)</b> Greater public awareness and appreciation of Hawai'i's environmental resources.			X
<b>(b) Policies:</b>			
<b>(1)</b> Foster educational activities that promote a better understanding of Hawai'i's limited environmental resources.	X		
<b>(2)</b> Promote the proper management of Hawai'i's land and water resources.	X		
<b>(3)</b> Promote effective measures to achieve desired quality in Hawai'i's surface, ground and coastal waters.	X		
<b>(4)</b> Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai'i's people.	X		

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
(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 Hawai'i'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 Hawai'i's people, their cultures and visitors.	X		
<b>Discussion:</b> During construction, any potential impacts to air quality will be minimized by using industry BMPs and project phasing. The design elements of the space will reflect the traditions, history and spiritual significance of Mānoa Valley and Hawaiian culture. It incorporates shaded common areas that visually connect pedestrians and residents to the Mānoa Stream and green corridors between the Upper Campus and Lower Campus.				
<b>HRS § 226-14: Objective and Policies for Facility Systems–In General</b>				
(a)	<b>Objective:</b> Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal and energy and telecommunication systems that support statewide social, economic and physical objectives.	X		
<b>(b) Policies:</b>				
(1)	Accommodate the needs of Hawai'i's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.	X		
(2)	Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.			X
(3)	Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.	X		
(4)	Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction and maintenance of facility systems.			X
<b>Discussion:</b> The location and timing of the Proposed Action align with the availability of adequate water supply, sewage treatment, drainage, transportation and public safety facilities. The Project Site is adjacent to other on-campus housing, and its placement encourages clustering of development as a cost reduction for providing utilities and other public facilities.				
<b>HRS § 226-15: Objectives and Policies for Facility Systems–Solid and Liquid Wastes</b>				
(a)	<b>Objectives:</b> Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:	X		
(1)	Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.			
(2)	Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility and other areas.			

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
<b>(b) Policies:</b>				
<b>(1)</b>	Encourage the adequate development of sewerage facilities that complement planned growth.	X		
<b>(2)</b>	Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.			X
<b>(3)</b>	Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.			X
<b>Discussion:</b> The Proposed Action will be included in the UHM Updated Master Sewage Plan that will complement planned growth.				
<b>HRS § 226-16: Objective and Policies for Facility Systems–Water</b>				
<b>(a) Objective:</b>	Planning for the State’s facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational and other needs within resource capacities.	X		
<b>(b) Policies:</b>				
<b>(1)</b>	Coordinate development of land use activities with existing and potential water supply.	X		
<b>(2)</b>	Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.			X
<b>(3)</b>	Reclaim and encourage the productive use of runoff water and wastewater discharges.	X		
<b>(4)</b>	Assist in improving the quality, efficiency, service and storage capabilities of water systems for domestic and agricultural use.			X
<b>(5)</b>	Support water supply services to areas experiencing critical water problems.			X
<b>(6)</b>	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		
<b>Discussion:</b> The location and timing of the Proposed Action align with the availability of adequate water supply, sewage treatment, drainage, transportation, and public safety facilities. It will incorporate water conservation methods into the design using LEED Silver <b>Certified</b> standards as guidelines and Low Impact Development (LID) practices will ensure that stormwater runoff will remain on-site.				
<b>HRS § 226-17: Objectives and Policies for Facility Systems–Transportation</b>				
<b>(a) Objectives:</b>	Planning for the State’s facility systems with regard to energy shall be directed toward the achievement of the following objectives:	X		
<b>(1)</b>	An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe and convenient movement of people and goods.	X		
<b>(2)</b>	A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.			X



HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
<b>(c) Policies:</b>				
<b>(1)</b>	Design, program and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;	X		
<b>(2)</b>	Coordinate state, county, federal and private transportation activities and programs toward the achievement of statewide objectives;	X		
<b>(3)</b>	Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;			X
<b>(4)</b>	Provide for improved accessibility to shipping, docking and storage facilities;			X
<b>(5)</b>	Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;			X
<b>(6)</b>	Encourage transportation systems that serve to accommodate present and future development needs of communities;	X		
<b>(7)</b>	Encourage a variety of carriers to offer increased opportunities and advantages to interisland movement of people and goods;			X
<b>(8)</b>	Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;			X
<b>(9)</b>	Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification;			X
<b>(10)</b>	Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawai'i's natural environment;	X		
<b>(11)</b>	Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation;	X		
<b>(12)</b>	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
<b>(13)</b>	Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.	X		
<b>Discussion:</b> The Project Site is located in the vicinity of several transit service lines and serviced by UHM's Rainbow Shuttle, as well as the "Biki" bikeshare system and short-and-long term bike storage racks. The Proposed Action would prioritize on-site parking for short-term rideshare, carshare and childcare loading zones to promote multi-modal transportation.				
<b>HRS § 226-18: Objectives and Policies for Facility Systems–Energy</b>				
<b>(a) Objectives:</b>	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:			
<b>(1)</b>	Dependable, efficient and economical statewide energy systems capable of supporting the needs of the people;			X
<b>(2)</b>	Increased energy security and self-sufficiency through the reduction and ultimate elimination of Hawai'i's dependence on imported fuels for electrical generation and ground transportation;			X

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
(3)	Greater diversification of energy generation in the face of threats to Hawai'i's energy supplies and systems;			X
(4)	Reduction, avoidance or sequestration of greenhouse gas emissions from energy supply and use; and			X
(5)	Utility models that make the social and financial interests of Hawai'i's utility customers a priority.			X
(b)	To achieve the energy objectives, it shall be the policy of this State to ensure the short- and long-term provision of adequate, reasonably priced and dependable energy services to accommodate demand.			X
<b>(c) Other Policies:</b>				
(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:			
(A)	Development of cost-effective demand-side management programs;			X
(B)	Education;			X
(C)	Adoption of energy-efficient practices and technologies; and	X		
(D)	Increasing energy efficiency and decreasing energy use in public infrastructure.			X
(5)	Ensure, to the extent that new supply-side resources are needed, that the development or expansion of energy systems uses the least-cost energy supply option and maximizes efficient technologies;			X
(6)	Support research, development, demonstration and use of energy efficiency, load management and other demand-side management programs, practices and technologies;			X
(7)	Promote alternate fuels and transportation energy efficiency;			X
(8)	Support actions that reduce, avoid or sequester greenhouse gases in utility, transportation and industrial sector applications;			X
(9)	Support actions that reduce, avoid or sequester Hawai'i's greenhouse gas emissions through agriculture and forestry initiatives;			X
(10)	Provide priority handling and processing for all state and county permits required for renewable energy projects;			X
(11)	Ensure that liquefied natural gas is used only as a cost-effective transitional, limited- term replacement of petroleum for electricity generation and does not			X

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
impede the development and use of other cost-effective renewable energy sources; and			
<b>(12)</b> Promote the development of indigenous geothermal energy resources that are located on public trust land as an affordable and reliable source of firm power for Hawai'i.			X
<b>Discussion:</b> LEED Silver <b>Certified</b> standards will be used as guidelines during the Proposed Action's design process to integrate water and energy conservation.			
<b>HRS § 226-18.5: Objectives and Policies for Facility Systems–Telecommunications</b>			
<b>(a) Objective:</b> Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient and economical statewide telecommunications systems capable of supporting the needs of the people.			X
<b>(b)</b> To achieve the telecommunications objective, it shall be the policy of this State to ensure the provision of adequate, reasonably priced and dependable telecommunications services to accommodate demand.			X
<b>(c) Other Policies:</b>			
<b>(1)</b> Facilitate research and development of telecommunications systems and resources;			X
<b>(2)</b> Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning;			X
<b>(3)</b> Promote efficient management and use of existing telecommunications systems and services; and			X
<b>(4)</b> Facilitate the development of education and training of telecommunications personnel.			X
<b>Discussion:</b> The Proposed Action does not affect the objectives and policies of the Facility Systems-Telecommunications.			
<b>HRS § 226-19: Objectives and Policies for Socio-Cultural Advancement–Housing</b>			
<b>(a) Objectives:</b> Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:	X		



HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
(1) Greater opportunities for Hawai'i's people to secure reasonably priced, safe, sanitary and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawai'i's population.	✘		✘
(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 Hawai'i's people.	✘		✘
<b>(b) Policies:</b>			
(1) Effectively accommodate the housing needs of Hawai'i's people.	X		
(2) Stimulate and promote feasible approaches that increase housing choices for low- income, moderate-income and gap-group households.	X		
(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style and size of housing.			X
(4) Promote appropriate improvement, rehabilitation and maintenance of existing housing units and residential areas.			X
(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services and other concerns of existing communities and surrounding areas.	X		
(6) Facilitate the use of available vacant, developable and underutilized urban lands for housing.	X		
(7) Foster a variety of lifestyles traditional to Hawai'i 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 Hawai'i.			X
<b>Discussion:</b> The Proposed Action is intended to provide <b>affordable</b> , family-oriented housing to UHM graduate students and junior faculty that are unable to utilize existing subsidized rental housing on campus because they do not meet specific eligibility criteria or are unable to afford the high cost of living in the neighborhoods surrounding UH. It would serve to expand the inventory of <b>affordable</b> housing on campus as a high-density, mixed-use, transit-oriented development.			
<b>HRS § 226-20: Objectives and Policies for Socio-Cultural Advancement–Health</b>			
<b>(a) Objectives:</b> Planning for the State's socio-cultural advancement with regard to health shall be directed towards achievement of the following objectives:			
(1) Fulfillment of basic individual health needs of the general public.	X		
(2) Maintenance of sanitary and environmentally healthful conditions in Hawai'i's communities.	X		

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
(3)	Elimination of health disparities by identifying and addressing social determinants of health.			X
<b>(b) Policies:</b>				
(1)	Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.			X
(2)	Encourage improved cooperation among public and private sectors in the provision of health care to accommodate the total health needs of individuals throughout the State.			X
(3)	Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care and related insurance costs.			X
(4)	Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.			X
(5)	Provide programs, services and activities that ensure environmentally healthful and sanitary conditions.	X		
(6)	Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring and enforcement.			X
(7)	Prioritize programs, services, interventions and activities that address identified social determinants of health to improve native Hawaiian health and well-being consistent with the United States Congress' declaration of policy as codified in title 42 United States Code section 11702 and to reduce health disparities.			X
<b>Discussion:</b> The Proposed Action will use LEED Silver <b>Certified</b> design standards to create environmentally healthy and sanitary living conditions.				
<b>HRS § 226-21: Objective and Policies for Socio-Cultural Advancement-Education</b>				
(a)	<b>Objective:</b> 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.	X		
<b>(b) Policies:</b>				
(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
(4)	Promote educational programs which enhance understanding of Hawaii's cultural heritage.	X		
(5)	Provide higher educational opportunities that enable Hawaii's people to adapt to changing employment demands.			X

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
(6)	Assist individuals, especially those experiencing critical employment problems or barriers or undergoing employment transitions, by providing appropriate employment training programs and other related educational opportunities.			X
(7)	Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking and reasoning.	X		
(8)	Emphasize quality educational programs in Hawai'i's institutions to promote academic excellence.			X
(9)	Support research programs and activities that enhance the education programs of the State.			X
<p><b>Discussion:</b> The primary purpose of the Proposed Action is to provide <del>affordable</del>, family-oriented housing to UHM graduate students and junior faculty that are unable to utilize existing rental housing on the UHM campus or afford market rental housing in surrounding neighborhoods. UHM has identified the need for housing as a priority for future growth on the UHM campus. <del>The Proposed Action intends to create affordable housing for UHM students and faculty for those who may not include</del> <del>c</del>Creating a childcare facility onsite for student and faculty children from two to five years old that would serve to develop resources and programs, like basic listening, speaking and reasoning skills, for early childhood education. It's close proximity to Kāpapa Lo'i 'o Kānewai could encourage student and visitor engagement and understanding of this cultural resource.</p>				
<p><b>HRS § 226-22: Objective and Policies for Socio-Cultural Advancement–Social Services</b></p>				
(a)	<b>Objective:</b> Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families and groups to become more self-reliant and confident to improve their well-being.	X		
<b>(b) Policies:</b>				
(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 Hawai'i's communities.			X
(4)	Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.			X
(5)	Support public and private efforts to prevent domestic abuse and child molestation and assist victims of abuse and neglect.			X
(6)	Promote programs which assist people in need of family planning services to enable them to meet their needs.			X



HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
<b>Discussion:</b> The Proposed Action is a P3 partnership between the Developer and UHM. It is intended to provide <b>affordable</b> , family-friendly housing on-campus.				
<b>HRS § 226-23: Objective and Policies for Socio-Cultural Advancement–Leisure</b>				
<b>(a) Objective:</b> Planning for the State’s socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic and recreational needs for present and future generations.		X		
<b>(b) Policies:</b>				
<b>(1)</b> Foster and preserve Hawai‘i’s multi-cultural heritage through supportive cultural, artistic, recreational and humanities-oriented programs and activities.				X
<b>(2)</b> 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
<b>(3)</b> Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities and improved facility design and maintenance.				X
<b>(4)</b> 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		
<b>(5)</b> Ensure opportunities for everyone to use and enjoy Hawai‘i’s recreational resources.				X
<b>(6)</b> Assure the availability of sufficient resources to provide for future cultural, artistic and recreational needs.				X
<b>(7)</b> Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawai‘i’s people.				X
<b>(8)</b> Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk and traditional art forms.				X
<b>(9)</b> Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawai‘i’s population to participate in the creative arts.				X
<b>(10)</b> Assure adequate access to significant natural and cultural resources in public ownership.		X		
<b>Discussion:</b> The Proposed Action would create a centralized "live-work-play" environment within UHM's park-like campus and encourage social interaction and connectivity across the campus. The Project Site's proximity to Ka Papa Lo'i 'O Kānewai could encourage student and visitor engagement with this cultural resource.				
<b>HRS § 226-24: Objective and Policies for Socio-Cultural Advancement–Individual Rights and Personal Well-being</b>				
<b>(a) Objective:</b> Planning for the State’s socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations.				X

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
<b>(b) Policies:</b>				
<b>(1)</b>	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
<b>(2)</b>	Uphold and protect the national and state constitutional rights of every individual.			X
<b>(3)</b>	Assure access to, and availability of, legal assistance, consumer protection and other public services which strive to attain social justice.			X
<b>(4)</b>	Ensure equal opportunities for individual participation in society.			X
<b>Discussion:</b> The Proposed Action does not affect the objectives and policies of the Socio-Cultural Advancement—Individual Rights and Personal Well-Being.				
<b>HRS § 226-25: Objective and Policies for Socio-Cultural Advancement-Culture</b>				
<b>(a) Objective:</b>	Planning for the State’s socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs and arts of Hawai‘i’s people.	X		
<b>(b) Policies:</b>				
<b>(1)</b>	Foster increased knowledge and understanding of Hawai‘i’s ethnic and cultural heritages and the history of Hawai‘i.	X		
<b>(2)</b>	Support activities and conditions that promote cultural values, customs and arts that enrich the lifestyles of Hawai‘i’s people and which are sensitive and responsive to family and community needs.	X		
<b>(3)</b>	Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community lifestyles in Hawai‘i.			X
<b>(4)</b>	Encourage the essence of the aloha spirit in people’s daily activities to promote harmonious relationships among Hawai‘i’s people and visitors.	X		
<b>Discussion:</b> The design elements of the space will reflect the traditions, history and spiritual significance of Mānoa Valley and Hawaiian culture. It incorporates shaded common areas that visually connect pedestrians and residents to the Mānoa Stream and green corridors between the Upper Campus and Lower Campus.				
<b>HRS § 226-26: Objectives and Policies for Socio-Cultural Advancement–Public Safety</b>				
<b>(a) Objectives:</b>	Planning for the State’s socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:			
<b>(1)</b>	Assurance of public safety and adequate protection of life and property for all people.	X		
<b>(2)</b>	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

HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES		Consistent?		
		Yes	No	N/A
(3)	Promotion of a sense of community responsibility for the welfare and safety of Hawai'i's people.			X
<b>(b) Policies Related to Public Safety:</b>				
(1)	Ensure that public safety programs are effective and responsive to community needs.	X		
(2)	Encourage increased community awareness and participation in public safety programs.			X
<b>(c) Policies Related to Criminal Justice:</b>				
(1)	Support criminal justice programs aimed at preventing and curtailing criminal activities.			X
(2)	Develop a coordinated, systematic approach to criminal justice administration among all criminal justice agencies.			X
(3)	Provide a range of correctional resources which may include facilities and alternatives to traditional incarceration in order to address the varied security needs of the community and successfully reintegrate offenders into the community.			X
<b>(d) Policies Related to Emergency Management:</b>				
(1)	Ensure that responsible organizations are in a proper state of readiness to respond to major war-related, natural or technological disasters and civil disturbances at all times.			X
(2)	Enhance the coordination between emergency management programs throughout the State.			X
<b>Discussion:</b> The HPD was contacted as part of the EA pre-consultation process and notified of the <u>DEA publication</u> . Their comments were included in the EA to ensure the Project Site is a safe environment for UHM students, residents and visitors.				
<b>HRS § 226-27: Objectives and Policies for Socio-Cultural Advancement-Government</b>				
(a)	<b>Objectives:</b> 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. (2) Fiscal integrity, responsibility and efficiency in the state government and county governments.			X
<b>(b) Policies:</b>				
(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 Hawai'i.			X



HAWAII STATE PLAN PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
(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
<b>Discussion:</b> The Proposed Action does not affect the objectives and policies of the Socio-Cultural Advancement—Government.			

Table 5-2 outlines the Proposed Action’s consistency with the Hawaii State Plan Part III Priority Guidelines. Those that do not apply are not discussed.

**Table 5-2: Consistency with Hawai'i State Plan Part III**

HAWAII STATE PLAN PART III. PRIORITY GUIDELINES	Consistent?		
	Yes	No	N/A
<b>HRS§226-103 Economic Priority Guidelines</b>			
<b>Discussion:</b> The Economic Priority Guidelines are not applicable to the Proposed Action.			
<b>HRS §226-104 Population Growth and Land Resources Priority Guidelines</b>			
<b>(a) Priority guidelines to effect desired statewide growth and distribution:</b>	X		
<b>(1)</b> Encourage planning and resource management to ensure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawai'i's people.	X		
<b>(2)</b> Manage a growth rate for Hawai'i's economy that will parallel future employment needs for Hawai'i's people.			X
<b>(3)</b> Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.			X
<b>(4)</b> Encourage major state and federal investments and services to promote economic development and private investment to the neighbor islands, as appropriate.			X
<b>(5)</b> 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
<b>(6)</b> 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
<b>(7)</b> Support the development of high technology parks on the neighbor islands.			X
<b>Discussion:</b> The Project Site is located within the Primary Urban Center. It would not increase population growth rates, but instead redistribute UHM students and faculty from other areas across O'ahu into a designated urban growth area.			
<b>(b) Priority guidelines for regional growth distribution and land resource utilization</b>			
<b>(1)</b> 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		
<b>(2)</b> Make available marginal or non-essential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.			X
<b>(3)</b> 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
<b>(4)</b> Encourage restriction of new urban development in areas where water is insufficient from any source for both agricultural and domestic use.			X
<b>(5)</b> 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 non-contiguous new urban core.			X

HAWAII STATE PLAN PART III. PRIORITY GUIDELINES	Consistent?		
	Yes	No	N/A
(6) Seek participation from the private sector for the cost of building infrastructure and utilities and maintaining open spaces.	X		
(7) Pursue rehabilitation of appropriate urban areas.	X		
(8) Support the redevelopment of Kaka'ako into a viable residential, industrial, and commercial community.			X
(9) Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.	X		
(10) Identify critical environmental areas in Hawai'i to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources.			X
(11) Identify all areas where priority should be given to preserving rural character and lifestyle.			X
(12) Utilize Hawai'i's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.	X		
(13) Protect and enhance Hawai'i's shoreline, open spaces, and scenic resources.			X
<b>Discussion:</b> The Proposed Action is a P3 project between UHM and the Developer. It is intended to encourage urban growth within existing urban area by providing <del>affordable</del> housing for UHM students and faculty on campus. The Project's design and the use of BMPs during construction will mitigate potential negative impacts on the surrounding environment.			
<b>HRS §226-105 Crime and Criminal Justice</b>			
<b>Discussion:</b> The Crime and Criminal Justice Guidelines are not applicable to the Proposed Action.			
<b>HRS §226-106 Affordable Housing</b>			
<b>Priority guidelines for the provision of affordable housing:</b>			
(1) Seek to use marginal or non-essential 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 Hawai'i's low and moderate-income households, gap-group households, and residents with special needs.			X
(5) Encourage continued support for government or private housing programs that provide low interest mortgages to Hawai'i's people for the purchase of initial owner-occupied housing.			X
(6) Encourage public and private sector cooperation in the development of rental housing alternatives.	X		X



HAWAII STATE PLAN PART III. PRIORITY GUIDELINES	Consistent?		
	Yes	No	N/A
(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
<b>Discussion:</b> The Proposed Action is a P3 project between UHM and the Developer that intends to provide <b>affordable</b> housing for UHM students and faculty on campus.			
<b>HRS §226-107 Quality Education</b>			
<b>Priority guidelines to promote quality education:</b>			
(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: (A) The electronic exchange of information; (B) Statewide electronic mail; and (C) Access to the Internet. 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 Hawai'i'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.			X
(9) Strengthen and expand educational programs and services for students with special needs.			X
<b>Discussion:</b> The Proposed Action includes creating a childcare facility onsite for student and faculty children from two to five years old that would serve to develop resources and programs for early childhood education.			
<b>HRS §226-108 Sustainability</b>			
<b>Priority guidelines and principals to promote sustainability:</b>			
(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		

HAWAII STATE PLAN PART III. PRIORITY GUIDELINES		Consistent?		
		Yes	No	N/A
(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.			X
(7)	Emphasizing that everyone, including individuals, families, communities, businesses, and government, has the responsibility for achieving a sustainable Hawai'i.			X
<b>Discussion:</b> The Proposed Action encourages balanced economic, social, community and environmental priorities by providing <del>affordable</del> housing, a childcare center and retail spaces for the UHM community. LEED Silver <b>Certified</b> standards will help guide the design to respect the State's natural resources, while design elements of the space will reflect the traditions, history, and spiritual significance of Mānoa Valley and Hawaiian culture.				
<b>HRS §226-109 Climate Change Adaption</b>				
<b>Discussion:</b> The Climate Change and Adaptation Guidelines are not applicable to the Proposed Action.				

### 5.1.2 Hawai'i State Functional Plan

The Hawai'i State Plan directs appropriate State agencies to prepare Functional Plans which address statewide needs, problems and issues and recommend policies and actions to mitigate those problems. The Functional Plans are prepared to further define and implement statewide goals, objectives, policies and priority guidelines contained in the Hawai'i State Plan. Thirteen Functional Plans were prepared to implement the State Plan provisions in the areas of agriculture, conservation lands, education, employment, energy, health, higher education, historic preservation, housing, human services, recreation, tourism and transportation. Table 5-3 outlines the Proposed Action's consistency with those objectives.

**Table 5-3: Consistency with Hawai'i State Functional Plans**

HAWAII STATE FUNCTIONAL PLANS		Consistent?		
		Yes	No	N/A
<b>1</b>	<b>Agricultural State Functional Plan (1991)</b>			
<b>Purpose:</b> Continued viability of agriculture throughout the State.				X
<b>Discussion:</b> The Proposed Action is not applicable to the Agricultural State Functional Plan.				
<b>2</b>	<b>Conservation Lands State Functional Plan (1991)</b>			
<b>Purpose:</b> Addresses issues of population and economic growth and its strain on current natural resources; broadening public use of natural resources while protecting lands and shorelines from overuse; additionally, promotes the aquaculture industry.				X
<b>Discussion:</b> The Proposed Action is not applicable to the Conservation Lands State Functional Plan.				
<b>3</b>	<b>Education State Functional Plan (1989)</b>			

HAWAII STATE FUNCTIONAL PLANS		Consistent?		
		Yes	No	N/A
<b>Purpose:</b> Improvements to Hawai'i's educational curriculum, quality of educational staff and access to adequate facilities.				X
<b>Discussion:</b> The Proposed Action is not applicable to the Education State Functional Plan.				
<b>4</b>	<b>Agricultural State Functional Plan (1991)</b>			
<b>Purpose:</b> Continued viability of agriculture throughout the State.				X
<b>Discussion:</b> The Proposed Action is not applicable to the Agricultural State Functional Plan.				
<b>5</b>	<b>Employment State Functional Plan (1990)</b>			
<b>Purpose:</b> Improve the qualifications, productivity and effectiveness of the State's workforce through better education and training of workers as well as efficient planning of economic development, employment opportunities and training activities.				X
<b>Discussion:</b> The Proposed Action is not applicable to the Employment State Functional Plan.				
<b>6</b>	<b>Health State Functional Plan</b>			
<b>Purpose:</b> Improve the health care system by providing for those who do not have access to private health care providers; increasing preventative health measures; addressing 'quality of care' elements in private and public sectors to cut increasing costs.				X
<b>Discussion:</b> The Proposed Action is not applicable to the Health State Functional Plan.				
<b>7</b>	<b>Higher Education Functional Plan (1984)</b>			
<b>Purpose:</b> Prepare Hawai'i's citizens for the demands of an increasingly complex world through providing technical and intellectual tools.				X
<b>Discussion:</b> The Proposed Action is not applicable to the Higher Education Functional Plan.				
<b>8</b>	<b>Historic Preservation State Functional Plan (1991)</b>			
<b>Purpose:</b> Preservation of historic properties, records, artifacts and oral histories; provide public with information/education on the ethnic and cultural heritages and history of Hawai'i		X		
<b>Discussion:</b> The Proposed Action will support the Historic Preservation State Functional Plan. No significant impacts to historic resources are anticipated for the Proposed Action because no historic properties occur on-site. However, because of the Project Site's proximity to known cultural resources an Archaeological Literature Review and Field Inspection report was prepared in connection with the EA. Recommendations from the report will be used to avoid impacts to any potential resources that may be found on-site during construction. As such, the Proposed Action, through the EA process, is consistent with the Historic Preservation State Functional Plan.				
<b>9</b>	<b>Housing State Functional Plan (1989)</b>			
<b>Purpose:</b> Provide affordable rental and for-sale housing; increase homeownership and amount of rental housing units; acquiring public and privately-owned lands for future residential development; maintain a statewide housing data system.		X		X
<b>Discussion:</b> The Proposed Action supports the Housing State Functional Plan by providing new <del>and affordable</del> rental housing units to UHM students and junior faculty.				
<b>10</b>	<b>Human Services State Functional Plan (1991)</b>			



HAWAII STATE FUNCTIONAL PLANS		Consistent?		
		Yes	No	N/A
<b>Purpose:</b> Refining support systems for families and individuals by improving elderly care, increasing preventative measures to combat child/spousal abuse and neglect; providing means for ‘self-sufficiency’				X
<b>Discussion:</b> The Proposed Action is not applicable to the Human Services State Functional Plan.				
<b>11</b>	<b>Recreation State Functional Plan (1991)</b>			
<b>Purpose:</b> Manage the use of recreational resources via addressing issues: (1) ocean and shoreline recreation, (2) mauka, urban and other recreation, (3) public access to shoreline and upland recreation areas, (4) resource conservation and management, (5) management of recreation programs/facilities/areas and (6) wetlands protection and management.				X
<b>Discussion:</b> The Proposed Action is not applicable to the Recreation State Functional Plan.				
<b>12</b>	<b>Tourism State Functional Plan (1991)</b>			
<b>Purpose:</b> Balance tourism/economic growth with environmental and community concerns; development that is cognizant of the limited land and water resources of the islands; maintaining friendly relations between tourists and community members; development of a productive workforce and enhancement of career and employment opportunities in the visitor industry.				X
<b>Discussion:</b> The Proposed Action is not applicable to the Tourism State Functional Plan.				
<b>13</b>	<b>Transportation State Functional Plan (1991)</b>			
<b>Purpose:</b> Development of a safer, more efficient transportation system that also is consistent with planned physical and economic growth of the state; construction of facility and infrastructure improvements; develop a transportation system balanced with new alternatives; pursue land use initiatives which help reduce travel demand.		X		
<b>Discussion:</b> The Proposed Action supports the Transportation State Functional Plan by reducing travel demand on Honolulu’s existing transportation systems by pursuing land use that promotes a “live-work-play” environment for students and faculty on the UHM campus. This would reduce the number of daily commuters and help reduce the travel demands on and around campus.				

### 5.1.3 State Land Use Law

The State Land Use Law, HRS §205, is intended to preserve, protect and encourage the development of lands in the State for uses that are best suited to the public health and welfare of Hawai‘i’s people. Under HRS §205, all lands in the State of Hawai‘i are classified by the State Land Use Commission (LUC) into one of four major categories of State Land Use Districts. These districts are identified as the Urban District, Agricultural District, Conservation District and Rural District. Permitted uses within the districts are prescribed under HRS §205-2 and the LUC’s Administrative Rules prescribed under HAR §15-15-3.

The Project is situated entirely in the Urban State Land Use District. The Urban District generally include lands characterized by “city-like” concentrations of people, structures and

services. This District also includes vacant areas for future development. Jurisdiction of Urban Districts lie primarily with the county. In general, lot sizes and uses permitted in the district area are established by the County ordinances or rules. The purpose and intent of the Proposed Action is consistent with the Urban State Land Use District.

#### **5.1.4 Hawai'i Coastal Zone Management Plan**

The National Coastal Zone Management (CZM) Program was created through passage of the Coastal Zone Management Act of 1972. The U.S. Congress enacted the CZM Act to assist states in better managing coastal and estuarine environments. The Act provides grants to states that develop and implement federally approved CZM plans. The goal of the CZM Act is to "preserve, protect, develop and where possible, to restore or enhance the resources of the nation's coastal zone." Hawai'i's CZM Act, adopted as HRS §205A, provides a basis for protecting, restoring and responsibly developing coastal communities and resources. In Hawai'i, the "coastal zone management area" means 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 territorial sea.

The Proposed Action's conformance with the ten objectives and numerous policies of the State of Hawai'i CZM Plan is set forth in Table 5-4 below (OP 1990). The Proposed Action does not include the use of land that is within the Special Management Area as designated by the City (*see* Figure 1-1: Location Map). Therefore, Special Management Area permits are not required to implement the Proposed Action.

**Table 5-4: Consistency with the Hawai‘i Coastal Zone Management Program**

HAWAII COASTAL ZONE MANAGEMENT PROGRAM OBJECTIVES		Consistent?		
		Yes	No	N/A
<b>1</b>	<b>Recreational Resources</b>			
	<b>Objective:</b> Provide coastal recreational opportunities accessible to the public.			X
	<b>Policies:</b>			
	<b>(A)</b> Improve coordination and funding of coastal recreational planning and management; and			X
	<b>(B)</b> Provide adequate, accessible and diverse recreational opportunities in the coastal zone management area by:			X
	<b>(i)</b> Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;			X
	<b>(ii)</b> 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
	<b>(iii)</b> Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;			X
	<b>(iv)</b> Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;			X
	<b>(v)</b> 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
	<b>(vi)</b> 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		
	<b>(vii)</b> Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches and artificial reefs for surfing and fishing; and			X
	<b>(viii)</b> 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
	<b>Discussion:</b> The Proposed Action is not a coastal dependent development, is not located on the coastline and is not in the SMA. Most policies are not applicable to the Proposed Action. However, the Proposed Action will comply with State water quality standards NPDES permit program conditions. The stormwater management system is designed to retain stormwater on-site. No impact to coastal waters is anticipated.			



HAWAII COASTAL ZONE MANAGEMENT PROGRAM OBJECTIVES		Consistent?		
		Yes	No	N/A
<b>2</b>	<b>Historic Resources</b>			
<b>Objective:</b> 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.		X		
<b>Policies:</b>				
<b>(A)</b> Identify and analyze significant archaeological resources;		X		
<b>(B)</b> Maximize information retention through preservation of remains and artifacts or salvage operations; and		X		
<b>(C)</b> Support state goals for protection, restoration, interpretation and display of historic resources.		X		
<b>Discussion:</b> While the Proposed Action does not fall within the coastal zone management area it will protect historic and archaeological resources. No significant impacts to historic resources are anticipated for the Proposed Action because no historic properties occur on-site. However, because of the Project Site's proximity to known cultural resources an ALRFI report was prepared in connection with the EA. Recommendations from the report will be used to avoid impacts to any potential resources that may be found on-site during construction.				
<b>3</b>	<b>Scenic and Open Space Resources</b>			
<b>Objective:</b> Protect, preserve and, where desirable, restore or improve the quality of coastal scenic and open space resources.		X		
<b>Policies:</b>				
<b>(A)</b> Identify valued scenic resources in the coastal zone management area;		X		
<b>(B)</b> Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;		X		
<b>(C)</b> Preserve, maintain and, where desirable, improve and restore shoreline open space and scenic resources; and				X
<b>(D)</b> Encourage those developments that are not coastal dependent to locate in inland areas.		X		
<b>Discussion:</b> The Proposed Action will preserve and maintain the integrity of Mānoa Stream through the use of temporary and permanent best management practices.				
<b>4</b>	<b>Coastal Ecosystems</b>			
<b>Objective:</b> Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.		X		
<b>Policies:</b>				
<b>(A)</b> Exercise an overall conservation ethic, practice stewardship in the protection, use and development of marine and coastal resources;				X
<b>(B)</b> Improve the technical basis for natural resource management;				X
<b>(C)</b> Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;				X

HAWAII COASTAL ZONE MANAGEMENT PROGRAM OBJECTIVES		Consistent?		
		Yes	No	N/A
<b>(D)</b>	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
<b>(E)</b>	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		
<b>Discussion:</b> The Proposed Action is not a coastal dependent development, is not located on the coastline and is not in the SMA. Most policies are not applicable to the Proposed Action. However, the Proposed Action will comply with State water quality standards, including the HDOH NPDES permit program. The stormwater management system is designed to retain stormwater on-site. No impact to coastal waters is anticipated.				
<b>5</b>	<b>Economic Uses</b>			
	<b>Objective:</b> Provide public or private facilities and improvements important to the State's economy in suitable locations.			X
<b>Policies:</b>				
<b>(A)</b>	Concentrate coastal dependent development in appropriate areas;			X
<b>(B)</b>	Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed and constructed to minimize adverse social, visual and environmental impacts in the coastal zone management area; and			X
<b>(C)</b>	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
<b>(i)</b>	Use of presently designated locations is not feasible;			X
<b>(ii)</b>	Adverse environmental effects are minimized; and			X
<b>(iii)</b>	The development is important to the State's economy.			X
<b>Discussion:</b> The Proposed Action is not a coastal dependent development, is not located on the coastline and does not contain any coastal ecosystems; therefore, these policies are not applicable.				
<b>6</b>	<b>Coastal Hazards</b>			
	<b>Objective:</b> Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution.	X		
<b>Policies:</b>				
<b>(A)</b>	Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence and point and nonpoint source pollution hazards;	X		
<b>(B)</b>	Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence and point and nonpoint source pollution hazards;	X		
<b>(C)</b>	Ensure that developments comply with requirements of the Federal Flood Insurance Program; and	X		

HAWAII COASTAL ZONE MANAGEMENT PROGRAM OBJECTIVES		Consistent?		
		Yes	No	N/A
<b>(D)</b> Prevent coastal flooding from inland projects.		X		
<b>Discussion:</b> The Proposed Action is located 1.6 miles inland from the coastline and outside of the projected storm wave, sea level rise and tsunami zones. It is adjacent to Mānoa Stream; however it is outside the 500-year floodplain and will comply with Federal Flood Insurance Program requirements as appropriate. Stormwater runoff will be managed on-site through LID design principals.				
<b>7</b>	<b>Managing Development</b>			
<b>Objective:</b> Improve the development review process, communication and public participation in the management of coastal resources and hazards.				X
<b>Policies:</b>				
<b>(A)</b> Use, implement and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;				X
<b>(B)</b> Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and				X
<b>(C)</b> Communicate the potential short and long-term impacts of proposed significant 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
<b>Discussion:</b> The Proposed Action is not a coastal development, is not located on the coastline and is not in the SMA; therefore, these policies are not applicable.				
<b>8</b>	<b>Public Participation</b>			
<b>Objective:</b> Stimulate public awareness, education and participation in coastal management.				X
<b>Policies:</b>				
<b>(A)</b> Promote public involvement in coastal zone management processes;				X
<b>(B)</b> Disseminate information on coastal management issues by means of educational materials, published reports, staff contact and public workshops for persons and organizations concerned with coastal issues, developments and government activities; and				X
<b>(C)</b> Organize workshops, policy dialogues and site-specific mediations to respond to coastal issues and conflicts.				X
<b>Discussion:</b> The Proposed Action is not a coastal development and is not in the SMA; therefore, these policies are not applicable.				
<b>9</b>	<b>Beach Protection</b>			
<b>Objective:</b> Protect beaches for public use and recreation.				X
<b>Policies:</b>				
<b>(A)</b> 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



HAWAII COASTAL ZONE MANAGEMENT PROGRAM OBJECTIVES		Consistent?		
		Yes	No	N/A
<b>(B)</b>	Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and			X
<b>(C)</b>	Minimize the construction of public erosion-protection structures seaward of the shoreline.			X
<b>(D)</b>	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
<b>(E)</b>	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
<b>Discussion:</b> The Proposed Action is not a coastal dependent development, is not located on the coastline and is not in the SMA; therefore, these policies are not applicable.				
<b>10</b>	<b>Marine Resources</b>			
<b>Objective:</b>	Promote the protection, use and development of marine and coastal resources to assure their sustainability.			X
<b>Policies:</b>				
<b>(A)</b>	Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;			X
<b>(B)</b>	Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;			X
<b>(C)</b>	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
<b>(D)</b>	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
<b>(E)</b>	Encourage research and development of new, innovative technologies for exploring, using or protecting marine and coastal resources.			X
<b>Discussion:</b> The Proposed Action is not a coastal dependent development, is not located on the coastline and is not in the SMA; therefore, these policies are not applicable.				

### 5.1.5 Long Range Development Plan

For decades, the UHM campus developed without the benefit of an organized vision and approved physical development plan. This was rectified in 1987, when the first UHM LRDP was approved and adopted. It envisioned a vital urban setting similar to a successful small town, within a pedestrian-friendly environment organized around gateways, outdoor malls, paths and plazas. The 1987 LRDP was updated in 1994 to respond to changes in academic priorities, capital improvement priorities, enrollment, environmental issues, funding and changes across the campus created in part by new developments.

The 1994 LRDP was updated in 2007, and this document is the LRDP guiding the Proposed Action. Additionally, the Proposed Action is one of several projects identified in the forthcoming UHM 2019 LRDP Update and aligns with its guiding principles for the UHM Framework for the Future as well as its Building Design and Performance Standards for the campus.

The 2007 LRDP puts emphasis on the next five to ten years of development and is based upon the principles of the 1987 Plan (UHM 2007). However, it incorporates several new “Major Themes” that were developed through a participatory visioning process that included students, staff, administrators and members of the community. The Major Themes were intended to create a vision for future development, while addressing current facility needs and the desire to create a more complete campus community experience. The Major Themes established are:

- Globally Connected Hawaiian Place of Learning, Leadership and Service
- Livable Urban Campus
- Outdoor Spaces for Living and Learning
- Leader in Environmental Sustainability

The Proposed Action fulfills these themes as it would create a centralized “live-work-play” environment on UHM’s campus that encourages social interaction and connectivity. It aims to create ~~affordable~~-housing for graduate students and junior faculty within a mixed-use collaborative environment and create a gathering space for students and faculty to shop, dine, interact and live near other UHM housing. This would create a livable urban campus by eliminating the need for students and faculty to commute to UHM, and the adjacency to other housing would foster a more complete campus community experience. Additionally, the Project Site’s proximity to Ka Papa Lo’i ‘O Kānewai could encourage student and visitor engagement with this cultural resource furthering the vision of creating a globally connected Hawaiian place of learning, leadership and service.

The design elements of the space will reflect the traditions, history and spiritual significance of Mānoa Valley and Hawaiian culture and create outdoor spaces for living and learning by

incorporating shaded common areas. The design encourages walkability by visually connecting pedestrians and residents to the Mānoa Stream and green corridors between the Upper Campus and Lower Campus. UHM's vision of being a leader in environmental sustainability is met by using LEED Silver Certified standards and LID practices to guide the design process to create an environmentally conscious development space.

## **5.2 CITY AND COUNTY OF HONOLULU**

### **5.2.1 O'ahu General Plan**

The *O'ahu General Plan* is a statement of objectives and policies for the long-range social, economic, environmental and design objectives of the City planning process over a 20-year time frame. The O'ahu General Plan was last updated and amended in October 2002 and this version is currently being revised ("the Revised General Plan"). We understand that the Revised General Plan is being reviewed by City Council as Resolution 20-44. The O'ahu General Plan is intended to guide all levels of government, private enterprise, neighborhood and citizen groups, organizations, and individual citizens in eleven (11) areas of concern including:

1. Population;
2. The economy;
3. Natural environment and resource stewardship;
4. Housing and communities;
5. Transportation and utilities;
6. Energy;
7. Physical development and urban design;
8. Public safety;
9. Culture and recreation; and
10. Government operations and fiscal management.

The Revised General Plan includes greater consideration for concerns such as climate change, sea level rise, and sustainability. As discussed in the Revised General Plan, examples of sustainability include compact and mixed-use development patterns that encourage higher densities to encourage energy and resource conservation as well as efficient building design to reduce water and energy consumption. The Proposed Action is consistent with these examples of sustainability. It is a mixed-use housing project located within the designated Primary Urban Center utilizing designs consistent with LEED Silver Certification standards.



The Proposed Action’s consistency with the objectives and policies of the currently adopted O’ahu General Plan is discussed further in Table 5-5 (CCH DPP 2002). Objectives that are not applicable are noted, but do not include a discussion.

**Table 5-5: Consistency with O’ahu General Plan**

O’AHU GENERAL PLAN OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
<b>Amended October 3, 2002 (Resolution 02-205, CD1)</b>			
<b>I. Population</b>			
<b>Objective A:</b> To control the growth of O’ahu’s resident and visitor populations in order to avoid social, economic and environmental disruptions.			X
<b>Policies</b>			
<b>(1)</b> Participate in State and Federal programs which seek to develop social, economic, legal and environmental controls over population growth.			X
<b>(2)</b> Seek a balance between the rate of immigration and the rate of outmigration by reducing immigration.			X
<b>(3)</b> Support Federal policies providing for a more even distribution of immigrants throughout the country.			X
<b>(4)</b> Seek to maintain a desirable pace of physical development through City and County regulations.			X
<b>(5)</b> Encourage family planning.			X
<b>(6)</b> Publicize the desire of the City and County to limit population growth			X
<b>Objective B:</b> To plan for future population growth.			X
<b>Policies</b>			
<b>(1)</b> Allocate efficiently the money and resources of the City and County in order to meet the needs of O’ahu’s anticipated future population.			X
<b>(2)</b> Provide adequate support facilities to accommodate future growth in the number of visitors to O’ahu.			X
<b>Objective C:</b> To establish a pattern of population distribution that will allow the people of O’ahu to live and work in harmony.	X		
<b>Policies</b>			
<b>(1)</b> Facilitate the full development of the primary urban center.	X		
<b>(2)</b> Encourage development within the secondary urban center at Kapolei and the ‘Ewa and Central O’ahu urban-fringe and rural areas and meet housing needs not readily provided in the urban center.			X
<b>(3)</b> Manage physical growth and development in the urban-fringe and rural areas so that:			
<b>(a)</b> An undesirable spreading of development is prevented; and,			X
<b>(b)</b> Their population densities are consistent with the character of development and environmental qualities desired for such areas.			X

O'AHU GENERAL PLAN OBJECTIVES AND POLICIES	Consistent?																						
	Yes	No	N/A																				
<b>Amended October 3, 2002 (Resolution 02-205, CD1)</b>																							
<p><b>(4)</b> Direct growth according to Policies 1, 2 and 3 above by providing land development capacity and needed infrastructure to seek a 2025 distribution of O'ahu's residential population as follows:</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>LOCATION</th> <th>% SHARE OF 2025 ISLANDWIDE POPULATION</th> </tr> </thead> <tbody> <tr> <td>Primary Urban Center</td> <td>46.0%</td> </tr> <tr> <td>Ewa</td> <td>13.0%</td> </tr> <tr> <td>Central Oahu</td> <td>17.0%</td> </tr> <tr> <td>East Honolulu</td> <td>5.3%</td> </tr> <tr> <td>Koolaupoko</td> <td>11.6%</td> </tr> <tr> <td>Koolauloa</td> <td>1.4%</td> </tr> <tr> <td>North Shore</td> <td>1.7%</td> </tr> <tr> <td>Waianae</td> <td>4.0%</td> </tr> <tr> <td></td> <td>100.0%</td> </tr> </tbody> </table>	LOCATION	% SHARE OF 2025 ISLANDWIDE POPULATION	Primary Urban Center	46.0%	Ewa	13.0%	Central Oahu	17.0%	East Honolulu	5.3%	Koolaupoko	11.6%	Koolauloa	1.4%	North Shore	1.7%	Waianae	4.0%		100.0%	X		
LOCATION	% SHARE OF 2025 ISLANDWIDE POPULATION																						
Primary Urban Center	46.0%																						
Ewa	13.0%																						
Central Oahu	17.0%																						
East Honolulu	5.3%																						
Koolaupoko	11.6%																						
Koolauloa	1.4%																						
North Shore	1.7%																						
Waianae	4.0%																						
	100.0%																						
<p><b>Discussion:</b> The Proposed Action would have positive impacts on Population policy objectives. UHM is located within the PUC, and the Proposed Action would create additional <del>affordable</del> housing units there. It would reduce physical growth and development in the urban-fringe areas by lowering the number of student and faculty commuters from these areas, creating a reduction in the undesirable spreading of development.</p>																							
<b>II. Economic Activity</b>																							
<b>Objective A:</b> To promote employment opportunities that will enable all the people of O'ahu to attain a decent standard of living.	X																						
<b>Policies</b>																							
<b>(1)</b> Encourage the growth and diversification of O'ahu's economic base.	X																						
<b>(2)</b> Encourage the development of small businesses and larger industries which will contribute to the economic and social well-being of O'ahu residents.	X																						
<b>(3)</b> Encourage the development in appropriate locations on O'ahu of trade, communications and other industries of a nonpolluting nature.	X																						
<b>(4)</b> Encourage the development of local, national and world markets for the products of O'ahu-based industries.			X																				
<b>(5)</b> Encourage the wider distribution of available employment opportunities through such methods as shortening the work week and reducing the use of overtime.			X																				
<b>(6)</b> Encourage the continuation of a significant level of Federal employment on O'ahu.			X																				
<p><b>Discussion:</b> The Proposed Action would have positive impacts on Economic Activity policy objectives. The Proposed Action includes retail space that would provide employment opportunities for UHM students or members of the community, which would contribute to the economic and social well-being of O'ahu residents.</p>																							

O'AHU GENERAL PLAN OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
<b>Amended October 3, 2002 (Resolution 02-205, CD1)</b>			
<b>Objective B: To maintain the viability of O'ahu's visitor industry.</b>			X
<b>Policies</b>			
(1) Provide for the long-term viability of Waikiki as O'ahu's primary resort area by giving the area priority in visitor industry related public expenditures.			X
(2) Provide for high quality and safe environment for visitors and residents in Waikiki.			X
(3) Encourage private participation improvements to facilities in Waikiki.			X
(4) Prohibit major increases in permitted development densities in Waikiki.			X
(5) Prohibit further growth in permitted development densities in Waikiki.			X
(6) Permit the development of secondary resort areas in West Beach, Kahuku, Makaha and Laie.			X
(7) Manage the development of secondary resort areas in a manner which respects existing lifestyles, the natural environment and avoids substantial increases in the cost of providing public services in the area.			X
(8) Preserve the well-known and widely publicized of O'ahu for visitors as well as residents.			X
(9) Encourage the visitor industry to provide a high level of service to visitors.			X
<b>Objective C: To maintain the viability of agriculture on O'ahu.</b>			X
<b>Policies</b>			
(1) Assist the agricultural industry to ensure the continuation of agriculture as an important source of income and employment.			X
(2) Support agricultural diversification in all agricultural areas on O'ahu.			X
(3) Support the development of markets for local products, particularly those with the potential for economic growth.			X
(4) Provide sufficient agricultural land in 'Ewa, Central O'ahu and the North Shore to encourage the continuation of sugar and pineapple as viable industries.			X
(5) Maintain agricultural land along the Windward, North Shore and Wai'anae coasts for truck farming, flower growing, aquaculture, livestock production and other types of diversified agriculture.			X
(6) Encourage the more intensive use of productive agricultural land.			X
(7) Encourage the use of more efficient production practices by agriculture, including the efficient use of water.			X
(8) Encourage the more efficient use of non- potable water for agricultural use.			X
<b>Objective D: To make full use of the economic resources of the sea.</b>			X
<b>Policies</b>			
(1) Assist the fishing industry to maintain its viability.			X

O'AHU GENERAL PLAN OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
<b>Amended October 3, 2002 (Resolution 02-205, CD1)</b>			
(2) Encourage the development of aquaculture, ocean research and other ocean-related activities.			X
(3) Focus the development of ocean related economic activities in the Northwestern Hawaiian Islands on those which are compatible with preserving the area's unique environmental, marine and wildlife assets.			X
<b>Objective E: To prevent the occurrence of large-scale unemployment.</b>			X
<b>Policies</b>			
(1) Encourage the training and employment of present residents for currently available and future jobs.			X
(2) Make full use of State and Federal employment and training programs.			X
(3) Encourage the provision of retraining programs for workers in industries with planned reductions in their labor force.			X
<b>Objective F: To increase the amount of Federal spending on O'ahu.</b>			X
<b>Policies</b>			
(1) Take full advantage of Federal programs and grants which will contribute to the economic and social well-being of O'ahu residents.			X
(2) Encourage the Federal government to pay for the cost of public services used by Federal agencies.			X
(3) Encourage the Federal government to lease new facilities rather than construct them on tax-exempt public land.			X
(4) Encourage the military to purchase locally all needed services and supplies which are available on O'ahu.			X
<b>Objective G: To bring about orderly economic growth on O'ahu.</b>			X
<b>Policies</b>			
(1) Direct major economic activity and government services to the primary urban center and the secondary urban center at Kapolei.			X
(2) Permit the moderate growth of business centers in the urban-fringe areas.			X
(3) Maintain sufficient land in appropriately located commercial and industrial areas to help ensure a favorable business climate on O'ahu.			X
(4) Encourage the continuation of a high level of military-related employment in the Hickam-Pearl Harbor, Wahiawa, Kailua-Kāne'ohe and 'Ewa areas.			X
<b>III. Natural Environment</b>			
<b>Objective A: To protect and preserve the natural environment.</b>	X		
<b>Policies</b>			
(1) Protect O'ahu's natural environment, especially the shoreline, valleys and ridges, from incompatible development.	X		
(2) Seek the restoration of environmentally damaged areas and natural resources.			X
(3) Retain the Island's streams as scenic, aquatic and recreation resources.	X		



O'AHU GENERAL PLAN OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
<b>Amended October 3, 2002 (Resolution 02-205, CD1)</b>			
(4) Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water- recharge areas, distinctive landforms and existing vegetation.	X		
(5) Require sufficient setbacks of improvements in unstable shoreline areas to avoid the future need for protective structures.			X
(6) Design surface drainage and flood-control systems in a manner which will help preserve their natural settings.	X		
(7) Protect the natural environment from damaging levels of air, water and noise pollution.	X		
(8) Protect plants, birds and other animals that are unique to the State of Hawai'i and the Island of O'ahu.	X		
(9) Protect mature trees on public and private lands and encourage their integration into new developments.			X
(10) Increase public awareness and appreciation of O'ahu's land, air and water resources.			X
(11) Encourage the State and Federal governments to protect the unique environmental, marine and wildlife assets of the Northwestern Hawaiian Islands.			X
<b>Discussion:</b> The Proposed Action will adhere to stringent BMPs during construction and operation to prevent impacts to surface and groundwater resources. As part of the EA process, a Flora and Fauna Survey was conducted. It determined that the Proposed Action may create minor short-term impacts to avian fauna found on-site during construction, these will only be temporary and have no long-term effects. Mitigation measures recommended in the report were included in the EA to prevent any significant or long-term impacts on the Project Site's natural environment.			
<b>Objective B:</b> To preserve and enhance the natural monuments and scenic views of O'ahu for the benefit of both residents and visitors.	X		
<b>Policies</b>			
(1) Protect the Island's well-known resources: its mountains and craters; forests and watershed areas; marshes, rivers and streams; shoreline, fishponds and bays; and reefs and offshore islands.			X
(2) Protect O'ahu's scenic views, especially those seen from highly developed and heavily traveled areas.	X		
(3) Locate roads, highways and other public facilities and utilities in areas where they will least obstruct important views of the mountains and the sea.			X
(4) Provide opportunities for recreational and educational use and physical contact with O'ahu's natural environment.			X
<b>Discussion:</b> The Proposed Action is similar in height and design to neighboring buildings and would not inhibit O'ahu's scenic views. During construction, potential impacts to air quality will be minimized using industry BMPs and project phasing. The Proposed Action anticipates potential			

O'AHU GENERAL PLAN OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
<b>Amended October 3, 2002 (Resolution 02-205, CD1)</b>			
minor short-term impacts to the acoustic environment from construction activities, such as excavation, grading and paving. These would be temporary, and no long-term impacts are anticipated.			
<b>IV. Housing</b>			
<b>Objective A:</b> To provide decent housing for all the people of O'ahu at prices they can afford.	X		
<b>Policies</b>			
<b>(1)</b> Develop programs and controls which will provide decent homes at the least possible cost.			X
<b>(2)</b> Streamline approval and permit procedures for housing and other development projects.			X
<b>(3)</b> Encourage innovative residential development which will result in lower costs, added convenience and privacy and the more efficient use of street and utilities.	X		
<b>(4)</b> Establish public, and encourage private, programs to maintain and improve the condition of existing housing.	X		
<b>(5)</b> Make full use of State and Federal programs that provide financial assistance for low- and moderate-income homebuyers.			X
<b>(6)</b> Expand local funding mechanisms available to pay for government housing programs.			X
<b>(7)</b> Provide financial and other incentives to encourage the private sector to build homes for low- and moderate-income homebuyers.			X
<b>(8)</b> Encourage and participate in joint public-private development of low- and moderate-income housing.	X		
<b>(9)</b> Encourage the preservation of existing housing which is affordable low- and moderate-income housing.			X
<b>(10)</b> Promote the construction of affordable dwellings which take advantage of O'ahu's year-round moderate climate.			X
<b>(11)</b> Encourage the construction of affordable homes with established low-density communities by such means as 'ohana units, duplex dwellings and cluster development.			X
<b>(12)</b> Encourage the production and maintenance of affordable rental housing.	X		X
<b>(13)</b> Encourage the provision of affordable housing designed for the elderly and the handicapped.			X
<b>(14)</b> Encourage equitable relationships between landowners and leaseholders, between landlords and tenants and between condominium developers and owners.			X
<b>Discussion:</b> The Proposed Action is a P3 partnership between the Developer and UHM. The primary purpose of the Proposed Action is to provide <del>affordable</del> , family-oriented housing to UHM graduate			

O'AHU GENERAL PLAN OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
students and junior faculty that are unable to utilize existing rental housing on campus or in surrounding neighborhoods.			
<b>Objective B:</b> To reduce speculation in land and housing.			X
<b>Policies</b>			
(1) Encourage the State government to coordinate its urban-area designations with the developmental policies of the City and County.			X
(2) Discourage private developers from acquiring and assembling land outside of areas planned for urban use.			X
(3) Seek public benefits from increases in the value of land owing to City and State developmental policies and decisions.			X
(4) Require government-subsidized housing to be delivered to appropriate purchasers and renters.			X
(5) Prohibit the selling or renting of government-subsidized housing for large profits.			X
<b>Objective C:</b> To provide the people of O'ahu with a choice of living environments which are reasonably close to employment, recreation and commercial centers and which are adequately served by public utilities.			X
<b>Policies</b>			
(1) Encourage residential developments that offer a variety of homes to people of different income levels and to families of various sizes.			X
(2) Encourage the fair distribution of low- and moderate-income housing throughout the Island.			X
(3) Encourage residential development near employment centers.			X
(4) Encourage residential development in areas where existing roads, utilities and other community facilities are not being used to capacity.			X
(5) Discourage residential development where roads, utilities and community facilities cannot be provided at a reasonable cost.			X
(6) Preserve older communities through self-help, housing-rehabilitation, improvement districts and other governmental programs.			X
<b>V. Transportation and Utilities</b>			
<b>Objective A:</b> To create a transportation system which will enable people and goods to move safely, efficiently and at a reasonable cost; serve all people, including the poor, the elderly and the physically handicapped; and offer a variety of attractive and convenient modes of travel.	X		
<b>Policies</b>			
(1) Develop and maintain an integrated ground-transportation system consisting of the following elements and their primary purposes:	X		
(a) Public transportation-for travel to and from work and travel within Central Honolulu;			X

O'AHU GENERAL PLAN OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
<b>Amended October 3, 2002 (Resolution 02-205, CD1)</b>			
<b>(b)</b> Roads and highways-for commercial traffic and travel in nonurban areas;			X
<b>(c)</b> Bikeways-for recreational activities and trips to work, schools, shopping centers and community facilities; and	X		
<b>(d)</b> Pedestrian walkways-for getting around Downtown and Waikīkī, and for trips to schools, parks and shopping centers.			X
<b>(2)</b> Provide transportation services to people living within the Ewa, Central O'ahu and Pearl City-Hawai'i Kai corridors primarily through a mass transit system including exclusive right-of-way rapid transit and feederbus components as well as through the existing highway system with limited improvements as may be appropriate.			X
<b>(3)</b> Provide transportation services outside the Ewa, Central O'ahu and Pearl City-Hawai'i Kai corridors primarily through a system of express- and feederbuses as well as through the highway system with limited to moderate improvements sufficient to meet the needs of the communities being served.			X
<b>(4)</b> Improve transportation facilities and services in the Ewa corridor and in the trans-Ko'olau corridors to meet the needs of Ewa and Windward communities.			X
<b>(5)</b> Improve roads in existing communities to reduce congestion and eliminate unsafe conditions.			X
<b>(6)</b> Consider both environmental impact as well as construction and operating costs as important factors in planning alternative nodes of transportation.			X
<b>(7)</b> Promote the use of public transportation as a means of moving people quickly and efficiently, of conserving energy and of guiding urban development.	X		
<b>(8)</b> Make available transportation services to people with limited mobility: the young, the elderly, the handicapped and the poor.			X
<b>(9)</b> Promote programs to reduce dependence on the use of automobiles.			X
<b>(10)</b> Discourage the inefficient use of the private automobile, especially in congested corridors and during peak-hour	X		
<b>(11)</b> Make public and encourage private, improvements to major walkway systems.	X		
<b>(12)</b> Encourage the provision of separate aviation facilities for small civilian aircraft.			X
<b>(13)</b> Facilitate the development of a second deep-water harbor to relieve congestion in Honolulu Harbor.			X
<b>Discussion:</b> The Proposed Action is one of several projects proposed to support the UHM's LRDP transportation and connectivity goals by helping to create a "live-work-play" environment for students and faculty on campus. To support UHM's objective of promoting multi-modal transportation, the Proposed Action would encourage the use of existing parking structures found on the UHM campus instead of developing long-term parking on-site. The Project Site is located in the			



O'AHU GENERAL PLAN OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
<b>Amended October 3, 2002 (Resolution 02-205, CD1)</b>			
vicinity of several transit service lines and serviced by UHM's Rainbow Shuttle, as well as a "Biki" bikeshare system and short-and-long term bike storage racks. It will incorporate paving and landscaping that promotes pedestrian activity and connectivity on and around the Project Site.			
<b>Objective B:</b> To meet the needs of the people of O'ahu for an adequate supply of water and for environmentally sound systems of waste disposal.			X
<b>Policies</b>			
(1) Develop and maintain an adequate supply of water for both residents and visitors.			X
(2) Develop and maintain an adequate supply of water for agricultural and industrial needs.			X
(3) Encourage the development of new technology which will reduce the cost of providing water and the cost of waste disposal.			X
(4) Encourage a lowering of the per-capita consumption of water and the per-capita production of waste.			X
(5) Provide safe, efficient and environmentally sensitive waste-collection and waste- disposal services.			X
(6) Support programs to recover resources from solid-waste and recycle wastewater.			X
(7) Require the safe disposal of hazardous waste.			X
<b>Objective C:</b> To maintain a high level of service for all utilities.			X
<b>Policies</b>			
(1) Maintain existing utility systems in order to avoid major breakdowns.			X
(2) Provide improvements to utilities in existing neighborhoods to reduce substandard conditions.			X
(3) Plan for the timely and orderly expansion of utility systems.			X
(4) Increase the efficiency of public utilities by encouraging a mixture of uses with peak periods of demand occurring at different times of the day.			X
<b>Objective D:</b> To maintain transportation and utility systems which will help O'ahu continue to be a desirable place to live and visit.			X
<b>Policies</b>			
(1) Give primary emphasis in the capital- improvement program to the maintenance and improvement of existing roads and utilities.			X
(2) Use the transportation and utility systems as a means of guiding growth and the pattern of land use on O'ahu.			X
(3) Encourage the study and use of telecommunications as an alternative to conventional transportation facilities.			X
(4) Evaluate the social, economic and environ- mental impact of additions to the transportation and utility systems before they are constructed.			X
(5) Require the installation of underground utility lines wherever feasible			X

O'AHU GENERAL PLAN OBJECTIVES AND POLICIES	Consistent?		
	Yes	No	N/A
<b>Amended October 3, 2002 (Resolution 02-205, CD1)</b>			
(6) Seek improved taxing powers for the City and County in order to provide a more equitable means of financing transportation and utility services.			X
<b>VI. Energy</b>			
<b>Objective A:</b> To maintain an adequate, dependable and economical supply of energy for O'ahu residents.			X
<b>Policies</b>			
(1) Develop and maintain a comprehensive plan to guide and coordinate energy conservation and alternative energy development and utilization programs on O'ahu.			X
(2) Establish economic incentives and regulatory measures which will reduce O'ahu's dependence on petroleum as its primary source of energy.			X
(3) Support programs and projects which contribute to the attainment of energy self-sufficiency on O'ahu.			X
(4) Promote and assist efforts to establish adequate petroleum reserves within Hawai'i's boundaries.			X
(5) Give adequate consideration to environmental, public health and safety concerns, to resource limitations and to relative costs when making decisions concerning alternatives for conserving energy and developing natural energy resources.			X
(6) Work closely with the State and Federal governments in the formulation and implementation of all City and County energy-related programs.			X
<b>Objective B:</b> To conserve energy through the more efficient management of its use.			X
<b>Policies</b>			
(1) Ensure that the efficient use of energy is a primary factor in the preparation and administration of land use plans and regulations.			X
(2) Provide incentives and, where appropriate, mandatory controls to achieve energy-efficient siting and design of new developments.			X
(3) Carry out public, and promote private, programs to more efficiently use energy in existing buildings and outdoor facilities.			X
(4) Promote the development of an energy-efficient transportation system.			X
<b>Objective C:</b> To fully utilize proven alternative sources of energy.			X
<b>Policies</b>			
(1) Encourage the use of commercially available solar energy systems in public facilities, institutions, residences and business developments.			X
(2) Support the increased use of operational solid waste energy recovery and other biomass energy conversion systems.			X

<b>Objective D:</b> To develop and apply new, locally available energy resources.			X
<b>Policies</b>			
(1) Support and participate in research, development, demonstration and commercialization programs aimed at producing new, economical and environmentally sound energy supplies from:			X
(a) solar insolation;			X
(b) biomass energy conversion;			X
(c) wind energy conversion;			X
(d) geothermal energy; and			X
(e) ocean thermal energy conversion.			X
(2) Secure State and Federal support of City and County efforts to develop new sources of energy.			X
<b>Objective E:</b> To establish a continuing energy information program.			X
<b>Policies</b>			
(1) Supply citizens with the information they need to fully understand the potential supply, cost and other problems associated with O‘ahu’s dependence on imported petroleum.			X
(2) Foster the development of an energy conservation ethic among O‘ahu residents.			X
(3) Keep consumers informed about available alternative energy sources and their costs and benefits.			X
(4) Provide information concerning the impact of public and private decisions on future energy use.			X
<b>Discussion:</b> The Proposed Action will have no effect on the energy objectives; therefore, these policies are not applicable.			
<b>VII. Physical Development and Urban Design</b>			
<b>Objective A:</b> To coordinate changes in the physical environment of O‘ahu to ensure that all new developments are timely, well-designed and appropriate for the areas in which they will be located.	X		
<b>Policies</b>			
(1) Plan for the construction of new public facilities and utilities in the various parts of the Island according to the following order of priority: first, in the primary urban center; second, in the secondary urban center at Kapolei; and third, in the urban- fringe and rural areas.	X		
(2) Coordinate the location and timing of new development with the availability of adequate water supply, sewage treatment, drainage, transportation and public safety facilities.	X		
(3) Phase the construction of new developments so that they do not require more regional supporting services than are available.			X
(4) Require new developments to provide or pay the cost of all essential community services, including roads, utilities, schools, parks and emergency facilities that are intended to directly serve the development			X

(5)	Provide for more compact development and intensive use of urban lands where compatible with the physical and social character of existing communities.	X		
(6)	Encourage the clustering of developments to reduce the cost of providing utilities and other public services.	X		
(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.			X
(8)	Locate community facilities on-sites that will be convenient to the people they are intended to serve.	X		
(9)	Exclude from residential areas, uses which are major sources of noise and air pollution.			X
(10)	Establish danger zones to exclude incompatible uses from hazardous areas surrounding airfields, electromagnetic- radiation sources and storage places for fuel and explosives			X
(11)	Prohibit new airfields, electromagnetic- radiation sources and storage places for fuel and explosives from locating on-sites where they will endanger or disrupt nearby communities.			X
<b>Discussion:</b> The Project Site is located within a designated Urban Land Use area on the UHM campus. The location and timing of the Proposed Action align with the availability of adequate water supply, sewage treatment, drainage, transportation and public safety facilities. The Project Site is adjacent to other on-campus housing, and its placement encourages clustering of development as a cost reduction for providing utilities and other public facilities.				
<b>Objective B:</b> To develop Honolulu (Wai‘alae-Kāhala to Hālawa), ‘Aiea and Pearl City as the Island's primary urban center.				X
<b>Policies</b>				
(1)	Stimulate development in the primary urban center by means of the City and County's capital improvement program and State and Federal grant and loan programs.			X
(2)	Provide for the expanded development of low-rise multi-unit housing.			X
(3)	Encourage the establishment of mixed-use districts with appropriate design and development controls to insure an attractive living environment and compatibility with surrounding land uses.			X
(4)	Provide downtown Honolulu and other major business centers with a well-balanced mixture of uses.			X
(5)	Encourage the development of attractive residential communities in downtown and other business centers.			X
(6)	Maintain and improve downtown as the financial and office center of the Island and as a major retail center.			X
(7)	Provide for the continued viability of the Hawai‘i Capital District as a center of government activities and as an attractive park-like setting in the heart of the City			X



<b>(8)</b> Foster the development of Honolulu's waterfront as the State's major port and maritime center, as a people-oriented mixed-use area and as a major recreation area.			X
<b>(9)</b> Facilitate the redevelopment of Kaka'ako as a major residential, as well as commercial and light industrial area.			X
<b>Objective C:</b> To develop a secondary urban center in 'Ewa with its nucleus in the Kapolei area.			X
<b>Policies</b>			
<b>(1)</b> Allocate funds from the City's capital-improvement program for public projects that are needed to facilitate development of the secondary urban center at Kapolei.			X
<b>(2)</b> Encourage the development of a major residential, commercial and employment center within the secondary urban center at Kapolei.			X
<b>(3)</b> Encourage the continuing development of Barbers Point as a major industrial center.			X
<b>(4)</b> Coordinate plans for the development of the secondary urban center at Kapolei with the State and Federal governments and with the sugar industry.			X
<b>(5)</b> Cooperate with the State and Federal governments in the development of a deep-water harbor at Barbers Point.			X
<b>(6)</b> Encourage the development of the 'Ewa Marina Community as a major residential and recreation area emphasizing recreational boating activities through the provision of a major marina and a related maritime commercial center containing light-industrial, commercial and visitor accommodation uses.			X
<b>Objective D:</b> To maintain those development characteristics in the urban-fringe and rural areas which make them desirable places to live.			X
<b>Policies</b>			
<b>(1)</b> 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			X
<b>(2)</b> 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.			X
<b>(3)</b> Establish a green belt in the Ewa and Central O'ahu areas of O'ahu in the Development Plans.			X
<b>(4)</b> 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.			X

<b>Objective E:</b> To create and maintain attractive, meaningful and stimulating environments throughout O’ahu.			X
<b>Policies</b>			
(1) Prepare and maintain a comprehensive urban-design plan for the Island of O’ahu.			X
(2) Integrate the City and County’s urban- design plan into all levels of physical planning and developmental controls.			X
(3) Encourage distinctive community identities for both new and existing districts and neighborhoods.			X
(4) Require the consideration of urban-design principles in all development projects.	X		
(5) Require new developments in stable, established communities and rural areas to be compatible with the existing communities and areas.			X
(6) Provide special design standards and controls that will allow more compact development and intensive use of lands in the primary urban center.	X		
(7) Promote public and private programs to beautify the urban and rural environments.	X		
(8) Preserve and maintain beneficial open space in urbanized areas.	X		
(9) Design public structures to meet high aesthetic and functional standards and to complement the physical character of the communities they will serve.			X
(10) Establish a review process to evaluate the design of major development projects.			X
<b>Discussion:</b> The Proposed Action is a P3 partnership between the Developer and UHM that is intended to provide compact development and more intense land use on the UHM campus, which is within the Primary Urban Center. The design elements of the space will reflect the traditions, history and spiritual significance of Mānoa Valley and Hawaiian culture. It will incorporate shaded common areas that visually connect pedestrians and residents to the Mānoa Stream and green corridors between the Upper Campus and Lower Campus.			
<b>Objective F:</b> To promote and enhance the social and physical character of O’ahu’s older towns and neighborhoods.			X
<b>Policies</b>			
(1) Encourage new construction to complement the ethnic qualities of the older communities of O’ahu.			X
(2) Encourage, wherever desirable, the rehabilitation of existing substandard structures.			X
(3) Provide and maintain roads, public facilities and utilities without damaging the character of older communities.			X
(4) Seek the satisfactory relocation of residents before permitting their displacement by new development, redevelopment or neighborhood rehabilitation.			X
<b>VIII. Public Safety</b>			
<b>Objective A:</b> To prevent and control crime and maintain public order.	X		

<b>Policies</b>			
(1)	Provide a safe environment for residents and visitors on O‘ahu.	X	
(2)	Provide adequate criminal justice facilities and staffing for City and County law- enforcement agencies.		X
(3)	Emphasize improvements to police and prosecution operations which will result in a higher proportion of wrongdoers who are arrested, convicted and punished for their crimes.		X
(4)	Keep the public informed of the nature and extent of criminal activity on O‘ahu.		X
(5)	Establish and maintain programs to encourage public cooperation in the prevention and solution of crimes.		X
(6)	Seek the help of State and Federal law- enforcement agencies to curtail the activities of organized crime syndicates on O‘ahu		X
(7)	Conduct periodic reviews of criminal laws to ensure their relevance to the community's needs and values.		X
(8)	Cooperate with other law-enforcement agencies to develop new methods of fighting crime.		X
(9)	Encourage the improvement of rehabilitation programs and facilities for criminals and juvenile offenders.		X
<b>Discussion:</b> The HPD was contacted as part of the EA pre-consultation process. Their comments were included in the EA to ensure the Project Site is a safe environment for UHM students, residents and visitors.			
<b>Objective B:</b> To protect the people of O‘ahu and their property against natural disasters and other emergencies, traffic and fire hazards and unsafe conditions.			X
<b>Policies</b>			
(1)	Keep up-to-date and enforce all City and County safety regulations.	X	
(2)	Require all developments in areas subject to floods and tsunamis to be located and constructed in a manner that will not create any health or safety hazard.		X
(3)	Participate with State and Federal agencies in the funding and construction of flood- control projects.		X
(4)	Cooperate with State and Federal agencies to provide tsunami warning and protection for O‘ahu.		X
(5)	Cooperate with State and Federal agencies to provide protection from war, civil disruptions and other major disturbances.		X
(6)	Reduce hazardous traffic conditions.		X
(7)	Provide adequate fire protection and effective fire prevention programs.	X	
(8)	Provide adequate search and rescue and disaster response services.		X
(9)	Design safe and secure public buildings.		X
(10)	Provide adequate staff to supervise activities at public facilities.		X
(11)	Develop civil defense plans and programs to protect and promote public health, safety and welfare of the people.		X

(12) Provide educational materials on civil defense preparedness, fire protection, traffic hazards and other unsafe conditions.			X
<b>Discussion:</b> The HFD was contacted as part of the EA pre-consultation process. Their comments were included in the EA to ensure the Project Site contains adequate fire protection on-site. All applicable safety regulations will be included in the design process of the Proposed Action.			
<b>IX. Health and Education</b>			
<b>Objective A:</b> To protect the health of the people of O‘ahu.			X
<b>Policies</b>			
(1) Encourage the provision of health-care facilities that are accessible to both employment and residential centers.			X
(2) Encourage prompt and adequate ambulance and first-aid services in all areas of O‘ahu.			X
(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.			X
<b>Objective B:</b> To provide a wide range of educational opportunities for the people of O‘ahu.	X		
<b>Policies</b>			
(1) Support education programs that encourage the development of employable skills.			X
(2) Encourage the provision of informal educational programs for people of all age groups.			X
(3) Encourage the after-hours use of school buildings, grounds and facilities.			X
(4) Encourage the construction of school facilities that are designed for flexibility and high levels of use.			X
(5) Facilitate the appropriate location of learning institutions from the preschool through the university levels.	X		
<b>Discussion:</b> The Proposed Action is a mixed-use development and includes a new child-care facility to replace an existing one that services approximately one hundred (100) children of UHM students and employees between the ages of two and five years old. The Project Site is appropriately placed to continue serving the childcare and development needs of UHM students and employees.			
<b>Objective C:</b> To make Honolulu the center of higher education in the Pacific.			X
<b>Policies</b>			
(1) Encourage continuing improvement in the quality of higher education in Hawai‘i.			X
(2) Encourage the development of diverse opportunities in higher education.			X
(3) Encourage research institutions to establish branches on O‘ahu.			X
<b>X. Culture and Recreation</b>			
<b>Objective A:</b> To foster the multiethnic culture of Hawai‘i.	X		
<b>Policies</b>			
(1) Encourage the preservation and enhancement of Hawai‘i’s diverse cultures.			X



(2) Encourage greater public awareness, understanding and appreciation of cultural heritage and contributions to Hawai'i made by the City's various ethnic groups.	X		
(3) Encourage opportunities for better interaction among people with different ethnic, social and cultural backgrounds.			X
(4) Encourage the protection of the ethnic identities of the older communities of O'ahu .			X
<b>Discussion:</b> The design elements of the space will reflect the traditions, history and spiritual significance of Mānoa Valley and Hawaiian culture. Further, the Project Site's proximity to Ka Papa Lo'i 'o Kānewai could encourage student and visitor engagement with this cultural resource.			
<b>Objective B:</b> To protect O'ahu's cultural, historic, architectural and archaeological resources.	X		
<b>Policies</b>			
(1) Encourage the restoration and preservation of early Hawaiian structures, artifacts and landmarks.			X
(2) Identify, and to the extent possible, preserve and restore buildings, sites and areas of social, cultural, historic, architectural and archaeological significance.	X		
(3) Cooperate with the State and Federal governments in developing and implementing a comprehensive preservation program for social, cultural, historic, architectural and archaeological resources.	X		
(4) Promote the interpretive and educational use of cultural, historic, architectural and archaeological sites, buildings and artifacts.			X
(5) Seek public and private fund and public participation and support, to protect social, cultural, historic, architectural and archaeological resources.			X
(6) Provide incentives for the restoration, preservation and maintenance of social, cultural, historic, architectural and archaeological resources.			X
<b>Discussion:</b> No significant impacts to historic resources are anticipated for the Proposed Action because no historic properties occur on-site. However, because of the Project Site's proximity to known cultural resources, an ALRFI report was prepared in connection with the EA. Recommendations from the report will be used to avoid impacts to any potential resources that may be found on-site during construction. As such, the Proposed Action, through the EA process, is consistent with the Historic Preservation State Functional Plan.			
<b>Objective C:</b> To foster the visual and performing arts.			X
<b>Policies</b>			
(1) Encourage and support programs and activities for the visual and performing arts.			X
(2) Encourage creative expression and access to the arts by all segments of the population.			X
(3) Provide permanent art in appropriate City public buildings and places.			X
<b>Objective D:</b> To provide a wide range of recreational facilities and services that are readily available to all residents of O'ahu.			X
<b>Policies</b>			

(1)	Develop and maintain community-based parks to meet the needs of the different communities on O‘ahu.			X
(2)	Develop and maintain a system of regional parks and specialized recreation facilities.			X
(3)	Develop and maintain urban parks, squares and beautification areas in high density urban places.			X
(4)	Encourage public and private botanic and zoological parks on O‘ahu to foster an awareness and appreciation of the natural environment.			X
(5)	Encourage the State to develop and maintain a system of natural resource-based parks, such as beach, shoreline and mountain parks.			X
(6)	Provide convenient access to all beaches and inland recreation areas.			X
(7)	Provide for recreation programs which serve a broad spectrum of the population.			X
(8)	Encourage ocean and water-oriented recreation activities that do not adversely impact on the natural environment.			X
(9)	Require all new developments to provide their residents with adequate recreation space.			X
(10)	Encourage the private provision of recreation and leisure-time facilities and services.			X
(11)	Encourage the after-hours, weekend and summertime use of public-school facilities for recreation.			X
(12)	Provide for safe and secure use of public parks, beaches and recreation facilities.			X
(13)	Encourage the safe use of O‘ahu 's ocean environments.			X
(14)	Encourage the State and Federal governments to transfer excess and underutilized land to the City and County for public recreation use.			X
<b>XI. Government Operations and Fiscal Management</b>				
<b>Objective A:</b> To promote increased efficiency, effectiveness and responsiveness in the provision of government services by the City and County of Honolulu.				X
<b>Policies</b>				
(1)	Maintain City and County government services at the level necessary to be effective.			X
(2)	Promote consolidation of State and City and County functions whenever more efficient and effective delivery of government programs and services can be achieved.			X
(3)	Ensure that government attitudes, actions and services are sensitive to community needs and concerns.			X
(4)	Prepare, maintain and publicize policies and plans which are adequate to guide and coordinate City programs and regulatory responsibilities.			X
<b>Objective B:</b> To ensure fiscal integrity, responsibility and efficiency by the City and County government in carrying out its responsibilities.				X
<b>Policies</b>				

(1) Provide for a balanced budget.			X
(2) Allocate fiscal resources of the City and County to efficiently implement the policies of the General Plan and Development Plans.			X
<b>Discussion:</b> The Proposed Action will have no effect on the Government Operations and Fiscal Management objectives; therefore, these policies are not applicable.			

### 5.2.2 Primary Urban Center Development Plan

The Project Site is located within the PUC DP area, which extends from downtown Honolulu to Pearl City in the west to Wai’alae-Kāhala in the east. The PUC DP is home to almost half of O’ahu’s population and three quarters of all jobs. The PUC DP (June 2004) provides a vision for the PUC in the areas of land use, transportation, infrastructure and public facilities. It also provides policies and guidelines for achieving that vision.

In 2018, the process of updating the PUC DP began and the document is currently being drafted by the City and County of Honolulu. The PUC DP update will continue to seek to provide a proactive approach to growth that incorporates guidance through specific land use policies, transit-oriented planning, and directed infrastructure investment. According to the PUC DP update’s All Policies Summary, good land use policies should prize community-focused design and character, elevate considerations of equitable development, remain responsive to market conditions and preferences, and respond to environmental conditions such as climate change and sea level rise, resource management and protection of sensitive ecological areas.

The Proposed Action is a mixed-use, housing project for UHM that encourages multi-modal transportation, while promoting sustainability and equitable development. Table 5-6 provides a summary of the Proposed Action’s consistency with the guidelines, policies and principles established in the currently adopted PUC DP (CCH DPP 2004).

**Table 5-6: Consistency with Primary Urban Center Development Plan**

PRIMARY URBAN CENTER DEVELOPMENT PLAN GUIDELINES, POLICIES AND PRINCIPLES	Consistent?		
	Yes	No	N/A
<b>CHAPTER 3: LAND USE AND TRANSPORTATION</b>			
<b>Protecting and Enhancing Natural, Cultural and Scenic Resources</b>			
<b>Preserve historic and cultural sites:</b> Special emphasis should be placed on-sites and associated settings that are unique, of special significance or are in good condition.	X		
<b>Preserve and protect natural resource and constraint areas:</b> Establish an urban community boundary to define urban development and protect areas outside the boundary for their open space, scenic and resource values.	X		

PRIMARY URBAN CENTER DEVELOPMENT PLAN GUIDELINES, POLICIES AND PRINCIPLES	Consistent?		
	Yes	No	N/A
<b>Preserve panoramic views of natural landmarks and the urban skyline:</b> This includes important vistas and focused views of significant natural and urban features and skyline profiles that make up or frame the PUC from publicly accessible places.	X		
<b>Develop stream greenbelts:</b> Keep or create mauka-makai connections and views up and down important streams and create public walkways where possible and appropriate.			X
<b>Provide parks and active recreation areas:</b> Create or strengthen parks, plazas and other conveniences throughout the PUC, especially in more populated areas as a balance to the built environment, for recreation, social interaction and leisure interludes.			X
<p><b>Discussion:</b> The Project Site is located within Urban State Land Use district on the UHM campus, supporting the PUC DP goal of developing within existing urban boundaries. The Proposed Action would create a centralized "live-work-play" development within UHM's park-like environment and encourage social interaction and connectivity across the campus. The Proposed Action is similar in height and design to neighboring buildings and would not inhibit views of the urban skyline. Because of the Project Site's proximity to known cultural resources an ALRFI report was prepared in connection with the EA. Recommendations from the report will be used to avoid impacts to any potential resources that may be found on-site during construction. As such, the Proposed Action, through the EA process, is consistent with the Historic Preservation State Functional Plan. Further, the Project Site's proximity to Ka Papa Lo'i 'O Kānewai could encourage student and visitor engagement. Natural resources occurring within the Project Site will be protected from any impacts by the proposed mitigation measures.</p>			
<b>Cultivating Livable Neighborhoods</b>			
<b>Develop a system for collaborative neighborhood planning:</b> Refine and further develop a stakeholder-based process for continuing community-based neighborhood planning for areas requiring this attention.	X		
<b>Cultivate existing and new "neighborhood centers":</b> Develop neighborhood centers as the principal places for people in a neighborhood to gather, shop, dine or play and to provide a source of community identity.	X		
<b>Promote mixed land uses:</b> Encourage compatible mixtures of land uses for intown PUC neighborhoods and districts to support a variety of urban lifestyle choices and to create vibrant and convenient neighborhoods.	X		
<b>Create parks that draw people and activity:</b> Develop parks that invite people and promote positive social interaction and activity.			X
<b>Make streets "pedestrian-friendly":</b> Create inviting and attractive streetside environments that support and enhance convenient and safe pedestrian use.			X
<p><b>Discussion:</b> The Proposed Action aims to create a collaborative environment by creating a gathering space for students and faculty to shop, dine, interact and live. The design elements of the space will reflect the traditions, history and spiritual significance of Mānoa Valley and Hawaiian culture by</p>			



PRIMARY URBAN CENTER DEVELOPMENT PLAN GUIDELINES, POLICIES AND PRINCIPLES	Consistent?		
	Yes	No	N/A
incorporating shaded common areas that visually connect pedestrians and residents to the Mānoa Stream and green corridors between the Upper Campus and Lower Campus. To ensure collaborative neighborhood planning, the Mānoa (No. 7), Diamond Head/Kapahulu/St. Louis Heights (No. 5) and McCully/Mō'ili'ili (No. 8) Neighborhood Boards have been contacted as part of the pre-consultation process.			
<b>In-Town Housing Choices</b>			
<b>Promote people-scaled apartment and townhouse dwellings in low- or midrise buildings oriented to the street:</b> This policy encourages residential buildings that are modest in height and have ground-floor shopping and dining opportunities to create pedestrian-oriented neighborhoods that satisfy a range of lifestyle needs conveniently.			X
<b>Improve the feasibility of redeveloping small lots:</b> Encourage housing variety and affordability by removing barriers for small-scale townhouse and low-rise apartment development on smaller apartment-zoned lots.			X
<b>Reduce costs for apartment homes:</b> Promote affordable housing choices consistent with creating livable communities by reducing certain construction and development-related costs.			X
<b>Provide adequate schools and parks for in-town neighborhoods:</b> Conveniently located schools and parks that can be reached safely are needed to meet the needs of young, active families.			X
<b>Expand the capacity of infrastructure, including water supply, sewers and storm drains:</b> This policy calls for government action and leadership in creating adequate infrastructure to meet present and future demands in order to support the strengthening or creation of livable in-town communities.			X
<b>Preserve and expand the current inventory of affordable rental housing units:</b> The City should assure that the current inventory of affordable rental units, whether owned by the City or not, is preserved and retained as affordable and that the inventory of affordable rental units is expanded as needed by the community.			X
<b>Support the retention, rehabilitation and improvement of older, low-rent apartment buildings:</b> Maintain, rehabilitate and improve older apartment buildings to retain existing housing stock as viable in-town housing choices.			X
<b>Provide for special needs housing:</b> Allow housing for people with special needs and promote their integration into the larger PUC community.			X
<b>Provide incentives and cost savings for affordable housing:</b> This policy promotes exemptions from regulations, on a case-by-case basis, to make "affordable" housing available to those needing it.			X
<b>Provide for high-density housing options in mixed-use developments around transit stations.</b> This type of "transit-oriented development" facilitates transit use	X		

PRIMARY URBAN CENTER DEVELOPMENT PLAN GUIDELINES, POLICIES AND PRINCIPLES	Consistent?		
	Yes	No	N/A
and allows for increased densities without generating increased vehicular congestion.			
<b>Discussion:</b> The Proposed Action is intended to provide <del>affordable</del> , family-oriented housing to UHM graduate students and junior faculty. It would serve to expand the inventory of <del>affordable</del> -housing on campus as a high-density, mixed-use, transit-oriented development. The Project Site is serviced by UHM’s Rainbow Shuttle and is in the vicinity of several of “The Bus” transit service lines, as well as a “Biki” bikeshare system and short-and-long term bike storage racks.			
<b>The Pacific’s Leading City</b>			
<b>Create public open space along the Pearl Harbor waterfront and strengthen the physical and visual connections between the urban center and the water:</b> This recognizes the waterfront as a principal element in the PUC’s setting and as an organizing reference point for the city and supports development of an economic and social asset for the surrounding community.			X
<b>Redevelop the Downtown/Iwilei waterfront:</b> This policy proposes to increase visual and physical access to the waterfront by re-routing traffic away from Nimitz Highway and introducing commercial activities such as restaurants, shops, offices and entertainment, low to medium-rise residences and areas capable of hosting recreational activities.			X
<b>Stimulate the development of high technology and knowledge-based industries:</b> Attract high-technology businesses to Hawai’i and provide in-town locations for them. Encourage investment in infrastructure within commercial buildings that will accommodate and attract high-technology and biotechnology businesses.			X
<b>Develop and implement a plan for a vibrant and livable Waikiki:</b> This plan should address resident and visitor experiences, the street environment, the design of new buildings and relationships with adjacent districts.			X
<b>Support attractions that are of interest to both residents and visitors in the Ala Moana/Kaka’ako/Downtown corridor.</b> Develop commercial and cultural attractions and improvements to serve residents and visitor interests.			X
<b>Provide opportunities for the development of visitor units in the Ala Moana/Kaka’ako/Downtown corridor:</b> Provide accommodation options for convention and business travelers conveniently located near downtown and the Hawai’i Convention Center.			X
<b>Provide opportunities for the development of village inns in existing commercial centers and allow bed and breakfast establishments in residential neighborhoods:</b> This policy encourages development of alternative visitor accommodations in contrast to the traditional resort enclaves of Waikiki.			X
<b>Support continuation of military uses:</b> Support and coordinate with the military’s long-range land planning activities to realize common employment, housing and recreation goals.			X

PRIMARY URBAN CENTER DEVELOPMENT PLAN GUIDELINES, POLICIES AND PRINCIPLES	Consistent?		
	Yes	No	N/A
<b>Enhance Honolulu Harbor and harbor-related uses:</b> Reserve lands adjacent to the harbor for harbor-related uses.			X
<b>Support industrial uses in Kalihi-Pālama industrial districts:</b> Support existing mixed-usages in the industrial districts of Kalihi-Kai and Kapālama, as well as existing commercial uses along the Nimitz, Dillingham, King, Kalihi and Waiakamilo corridors.			X
<b>Define the role of town centers and promote a mixture of land uses in ‘Aiea-Pearl City:</b> Strengthen the functions and latent identities of town centers in Pearl City, ‘Aiea, Waimalu and Hālawa and establish the Pearlridge area as a Pearl Harbor Regional Town Center.			X
<b>Encourage the full use of existing private and public parking garages:</b> Encourage private parking garage owners to rent underused parking stalls within commercial buildings and large-scale residential projects.	X		
<b>Discussion:</b> The Proposed Action will encourage the use of existing parking structures found on the UHM campus instead of developing long-term parking on-site.			
<b>Develop a Balanced Transportation System</b>			
<b>Implement land use strategies to achieve a balanced transportation system:</b> To achieve community livability and enable transportation choices, land use strategies that support alternative travel modes such as walking, bicycling and transit should be adopted and implemented.	X		
<b>Improve the public transit system, including development of a rapid transit component:</b> A convenient and efficient public transit system aids in maintaining traffic flows at an acceptable level for an attractive and successful urban setting. An effective public transit system for the PUC could be created with an east-west rapid transit route supplemented by effective links to the PUC’s valley communities.		X	
<b>Implement Transportation Demand Management (TDM) strategies:</b> Employ management strategies that encourage alternative travel models.	X		
<b>Review existing plans and establish priorities for roads and road improvements:</b> Conduct a comprehensive classification of roadways to identify prospective improvements (e.g., automobile, transit, bikeways, pedestrian routes) and prioritize the implementation of such improvements.			
<b>Implement the Honolulu Bicycle Master Plan:</b> Institutionalize a policy that all streets designated for bicycle travel should be maintained to accommodate shared bicycle and automobile use.			X
<b>Enhance and improve pedestrian mobility:</b> Create pedestrian districts, route and a regional pedestrian network and address pedestrian safety concerns.	X		
<b>Encourage the full use of existing private and public parking garages:</b> Encourage private parking garage owners to rent underused parking stalls with commercial buildings and large-scale residential projects.	X		

PRIMARY URBAN CENTER DEVELOPMENT PLAN GUIDELINES, POLICIES AND PRINCIPLES	Consistent?		
	Yes	No	N/A
<p><b>Discussion:</b> The Project Site is serviced by UHM’s Rainbow Shuttle and is in the vicinity of several of TheBus’s transit service lines, as well as a "Biki" bikeshare system and short-and-long term bike storage racks. The Proposed Action incorporates shaded common areas that encourage walkability by visually connecting pedestrians and residents to the Mānoa Stream and green corridors between the Upper Campus and Lower Campus. The Proposed Action would prioritize on-site parking for short-term rideshare, carshare and childcare loading zones to promote multi-modal transportation. To further support multi-modal transportation, the Proposed Action would encourage the use of existing long-term parking structures found on the UHM campus instead of developing any on-site.</p>			
<b>CHAPTER 4: INFRASTRUCTURE AND PUBLIC FACILITIES</b>			
<b>Water Allocation and System Development</b>			
Integrate resource management of all potable and non-potable water sources, including groundwater, stream water, storm water and wastewater effluent.	X		
Adapt water conservation practices in the design of new developments and modification of existing uses, including landscaped areas.	X		
Implement upgrades and capacity improvements to serve projected population increases.			X
Protect and maintain watersheds to ensure an adequate supply of high-quality water with sufficient infiltration recharge into groundwater aquifers.			X
<p><b>Discussion:</b> LEED Silver <b>Certified</b> standards will be used as guidelines during the Proposed Action’s design process to integrate water conservation. LID practices and temporary and permanent BMPs will be used to prevent construction related runoff from exiting the work area and entering any surface or groundwater resources. These actions serve to integrate water resource management into the Project Design by protecting stream water quality and encouraging on-site groundwater recharge.</p>			
<b>Wastewater System</b>			
Implement wastewater collection system improvements to provide adequate service and sound facilities to existing neighborhoods and timely increases in system capacity to areas planned to undergo improvement or change in use.			X
Implement adequate and timely upgrades/expansion of wastewater treatment facilities to meet the growth demands of the PUC.			X
<p><b>Discussion:</b> The Proposed Action is not applicable to the Wastewater System requirements of the PUC DP.</p>			
<b>Electrical Power</b>			
Support retention and upgrade of the Waiau and Honolulu Power Plants as part of a strategic plan to improve the reliability of the PUC’s electrical power system.			X
Promote and implement energy conservation measures and integrated resource planning.	X		
Planning and building of new or relocated transmission lines should take into consideration system and cost concerns and the impacts on the environment. Options to place utility lines underground should be considered, and priorities should be established.			X



PRIMARY URBAN CENTER DEVELOPMENT PLAN GUIDELINES, POLICIES AND PRINCIPLES	Consistent?		
	Yes	No	N/A
<b>Discussion:</b> LEED Silver Certification standards will be used as guidelines during the Proposed Action's design process to implement energy conservation measures.			
<b>Telecommunications Facilities</b>			
Minimize the visual impacts and potential health hazard of new facilities.			X
<b>Discussion:</b> The Proposed Action is not applicable to the Telecommunications Facilities requirements of the PUC DP.			
<b>Solid Waste</b>			
Reduce the solid waste stream by encouraging recycling and reuse.			X
Reduce dependence on landfills by encouraging alternative waste disposal technologies.			X
<b>Discussion:</b> The Proposed Action is not applicable to the solid waste requirements of the PUC DP.			
<b>Stormwater Systems</b>			
Require methods of retaining or detaining stormwater for gradual release into the ground as the preferred strategy for the management of stormwater. Where feasible, utilize open spaces including parking lots, landscaped areas, parks and golf courses to detain or infiltrate stormwater flows to reduce their volume and runoff rates. ( <i>City Council Resolution No. 94-296</i> ).	X		
Manage stormwater flows through best management practices to minimize stormwater runoff and peak discharge rates.	X		
Preserve stream and estuarine habitats.	X		
<b>Discussion:</b> LID practices and temporary and permanent BMPs will be used to prevent construction related stormwater runoff from exiting the work area and entering any surface or groundwater resources. This will serve to protect stream water quality and encourage on-site groundwater recharge. The specific type and location of these LID practices and BMPs will be determined during the Proposed Action's design process.			
<b>School and Library Facilities</b>			
Support the development of a high-quality educational system of schools and post-secondary institutions that increase the attractiveness of the PUC as a place to live and work.			X
Work with the DOE to develop innovative shared-use facilities, particularly on City-owned school properties.			X
<b>Discussion:</b> The Proposed Action is not applicable to the School and Library Facilities requirements of the PUC DP.			
<b>Civic and Public Safety Facilities</b>			
Provide adequate staffing and facilities to ensure effective and efficient delivery of basic governmental service and protection of public safety.			X
<b>Discussion:</b> The Proposed Action is not applicable to the Civic and Public Safety Facilities requirements of the PUC DP.			

### 5.2.3 Land Use Ordinance

The LUO establishes zoning regulations to regulate and review land uses and development standards in accordance with the City's land use policies, such as the O'ahu General Plan and PUC DP. The Project Site is located within an R-5 Residential zone. However, a minor modification to UHM's existing PRU (see Section 5.2.4 below) would allow the Proposed Action to be regulated in accordance with the development standards set forth by the UHM LRDP. Approval of the PRU would supersede the LUO zoning regulations.

### 5.2.4 Plan Review Use

The purpose of City's PRU process is to establish a review and approval mechanism for land uses that provide essential community services that are permanent or institutional in nature but may also create major adverse impacts on the surrounding land uses. The intent of the PRU is that these land uses be master planned to minimize adverse impacts or potentially incompatible land uses permitted within the zoning district. One of the general provisions of the PRU is that a master plan, spanning at least five years, be approved by City Council resolution. The master plan may consist of both existing and future development, but no uses or structures other than those included in the approved master plan are permitted on subject lots.

As part of the 2007 LRDP update, a new PRU was prepared and approved by the City on March 17, 2010 (2009/PRU-3) (Resolution 09-341, CD1, FD1) (UHM 2009). Since the Project Site was formerly under control by the federal government, it was not included in the PRU area. In 2018, approval for a minor modification to the existing PRU was granted by DPP to incorporate the property and its existing facilities into the PRU area. During plan preparation for the Proposed Action, DPP was consulted and determined the Proposed Action would require a minor modification to the existing PRU. An application for a minor modification to the PRU will be submitted to DPP following submittal and review of the FEA. The minor modification will address any modifications to development standards and will include conceptual drawings and greater detail on the building and site plans as they are further developed. The submittal will also include further details regarding the nature of the retail operations and commercial retail spaces, child-care drop-off and pick-up areas, and vehicular and pedestrian traffic. The details regarding the child-care drop-off and operations and vehicular circulation (including possible exiting to East-West Road) are being refined, and the project may require the use of a portion of University property in TMK 2-8-023: 003 as discussed in the TIR (see Appendix E).

## 5.3 PERMITS AND APPROVALS

The Proposed Action will be subject to the following list of permits and approvals:

**Table 5-7: Permits and Approvals**

<b>State</b>	
Department of Health	National Pollutant Discharge Elimination System
	<u>Disability and Communication Access Board Permit</u>
Department of Land and Natural Resources – Historic Preservation Division	HRS §6E Consultation, State Historic Preservation Law
<b>City and County</b>	
Department of Planning and Permitting	Plan Review Use Minor Modification
	Building Permit
	Grading Permit
<u>Department of Transportation Services</u>	<u>Transportation Mobility Division Review</u>
	<u>Street Usage Permit</u>

*(This page intentionally left blank)*



## 6 ALTERNATIVES CONSIDERED

As a requirement of HAR §11-200.1-18 (2019), an environmental assessment must identify and consider alternatives to achieve the Purpose and Need (PN) of the Proposed Action. Alternatives eliminated from consideration are those that do not meet the PN. They are described in this section and include the no action alternative, alternative sites and alternative designs.

### 6.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, the Project Site's existing conditions would remain as the Proposed Action would not take place. Within this alternative, UHM would continue to deal with limited ~~affordable~~ on-campus housing into the future. The existing buildings on the Project Site are not usable (functionally obsolete, hazardous materials); the exterior areas would continue to function as temporary parking and exterior storage. The No Action Alternative would have no short-or long-term impacts on the existing resources found on the Project Site.

However, this alternative fails to meet the PN of the Proposed Action, which is to provide ~~affordable~~, family-oriented housing to UHM graduate students and junior faculty. Further, it fails to meet the objectives of the 2007 LRDP. Because of its failure to meet the PN and the objectives of the 2007 LRDP, it is not a feasible alternative and was dismissed.

### 6.2 ALTERNATIVE PROJECT SITE

Under the current PRU, there are three proposed rehabilitation/replacement housing projects, the Hale Noelani Replacement Dormitory Project, the Johnson Hall Replacement Dormitory Project and the Faculty Housing-Wa'ahila Ridge/Mauka Campus Project, that could be expanded to provide additional housing on campus. However, funding, logistics and other constraints make replacement of these existing facilities challenging. As a result, at this time, the demolition and replacement proposed for the three projects is no longer being pursued by UHM. Instead, UHM has decided to pursue development of housing financed through a public-private partnership on readily available land in close proximity to other student and faculty housing facilities on campus. These alternative sites therefore do not meet the Proposed Action's PN and were dismissed.

### 6.3 ALTERNATIVE PROJECT DESIGN

The Developer considered several design schemes with a focus on building height, setback and configuration. The preferred design scheme meets the PN of the Proposed Action as well as the major themes of the 200~~1~~7 LRDP. Further, it incorporates a childcare facility on-site

creating a family-oriented environment. The following design schemes were considered and dismissed:

- One design alternative proposed was constructing two fifteen-story buildings on the Project Site. This alternative was dismissed because of the potential visual impacts and mass it would create along Dole Street.
- A second design alternative proposed was constructing two buildings that were physically connected creating a solid wall between them. This alternative was dismissed because it would reduce the amount of available housing units, create potential visual impacts and remove the outdoor gathering space.
- A third design alternative proposed was to construct the first building at a twenty-foot setback from Dole Street. This design alternative was dismissed because it was too oppressive when observed from Dole Street, creating visual impacts. Further, it did not meet the character of the surrounding neighborhood.
- A fourth design alternative proposed was constructing only one building. This alternative as dismissed because it would not create enough available housing units to meet the PN.

#### **6.4 EXCLUDING THE CHILDCARE FACILITY**

One design alternative considered excluding the on-site childcare facility. This alternative was dismissed because the childcare facility was a program preference in UHM's RFP and was used as a selection criterion in awarding the project. Additionally, excluding the facility would not meet the PN of the Proposed Action, which is to develop family-friendly housing on campus.

## 7 FINDINGS AND DETERMINATIONS

### 7.1 PRELIMINARY DETERMINATION OF FONSI

A Finding of No Significant Impact (FONSI) determination is recommended for the Proposed Action. No short- or long-term significant impacts have been anticipated, and therefore, an Environmental Impact Statement (EIS) would not be required.

### 7.2 FINDINGS AND REASONS SUPPORTING DETERMINATION

Potential impacts of the Proposed Action have been evaluated in accordance with the significance criteria, pursuant to HAR §11-200.1-13. The following findings and reasons indicate that the Proposed Action will have no significant adverse impacts on the environment based on the thirteen significance criteria and are presented as follows: , pursuant to HAR §11-200.1-13:

#### 1) Irrevocably commit a natural, cultural, or historic resource;

The Proposed Action would not irrevocably commit any natural, cultural or historic resources at the Project Site. The project location and design have been selected to remain consistent with the existing conditions and surrounding environment. BMPs and mitigation measures would be implemented to avoid or minimize potential impacts that would result in significant losses or destruction to natural or cultural resources. Contractors will adhere to specific protocol for monitoring and preserving ~~significant~~ habitat of Federal- or State-listed species should they be found at the Project Site during construction. Subsurface testing would occur during demolition of the existing buildings to monitor for potential subsurface archaeological deposits in order to minimize any potential impact on cultural resources. SHPD will be consulted prior to initiating subsurface testing, and if SHPD determines testing must be done prior to demolition the Developer will comply. To protect the water quality and flow from Mānoa Stream to Kānewai lo'i the avoidance, minimization, and mitigation measures described in Sections 2.3.3.1, 2.4.3.1, 3.2.1, and 3.3.1 will be implemented.

#### 2) Curtail the range of beneficial uses of the environment;

The Proposed Action would remain consistent with UHM's urban-residential uses surrounding the Project Site and would not curtail future beneficial uses of the environment. The project location and design have been selected to further the objectives set forth by UHM's LRDP, PRU and *Framework for the Future*.

**3) Conflict with the State’s environmental policies or long-term environmental goals established by law;**

The Proposed Action would not conflict with the State’s environmental policies and objectives or long-term environmental goals, as discussed in Section 5, *Relationship to Land Use Policies, Plans and Controls*. BMPs and mitigation measures would be implemented to avoid or minimize potential impacts associated with construction or operation activities at the Project Site.

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

The Proposed Action would provide long-term benefits to UHM that are consistent with the LRDP, PRU and *Framework for the Future*. The proposed housing facility is intended to meet a growing demand for **affordable** housing at UHM and create a “live-work-play” environment that fosters inclusivity and connectivity for campus community members, therefore creating a long-term positive effect on the economic and social welfare of the community and State. The Project Site is located in close proximity to the majority of campus amenities, including the existing athletic fields, dining centers, student and faculty housing complexes and public county community park, making it an ideal location for a family-oriented, mixed-use housing facility on campus. Construction and operation activities would also create new employment opportunities for the community and tax revenue for the State.

The Proposed Action would not impact traditional and cultural practices, as according to the archaeological literature review and field inspection report there are no known sacred sites or cultural objects or resources known to occur on-site (SCS 2020). BMPs and mitigation measures would be implemented to protect the existing conditions of Mānoa Stream and avoid impacts to Ka Papa Lo’i ‘O Kānewai downstream. The project design aims to incorporate cultural and environmental motifs to honor the traditional, history and spiritual significance of Mānoa Valley and Hawaiian culture.

**5) Have a substantial adverse effect on public health;**

The Proposed Action would not contribute any adverse effects on public health. The project location and design aim to support health and wellness for residents on the UHM campus by incorporating natural landscaping, pedestrian corridors and outdoor gathering spaces. Multi-modal transportation would be encouraged to reduce traffic impacts on the surrounding community and environment. Short-term impacts to noise and air quality would be minimized through construction phasing and BMPs, and to maintain compliance with existing City and State policies and regulations.



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

The Proposed Action would not cause substantial adverse secondary impacts to the social environment or public resources. The multi-family, mixed-use affordable housing facility would create a “live-work-play” environment for graduate students and faculty to reside on campus. The use of public services and infrastructure would be consistent with existing UHM population demand and remain within the limits of the current LRDP and PRU; a portion of the undeveloped housing footprint of UHM’s existing PRU will be transferred to this site.

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

The Proposed Action would not degrade environmental quality at the Project Site or surrounding area. The project location and design were selected to remain consistent with existing land use in the surrounding area.

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

The Proposed Action would not have a substantial adverse effect upon the environment and does not involve future commitments beyond the current project scope.

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

The Proposed Action would not cause significant impact to rare, threatened or endangered species or habitats on the Project Site. Suitable nesting habitat identified for species protected under the MBTA was limited to the State-listed white tern. Although suitable roosting and foraging habitat was identified for two (2) Federal- and State-listed species, the Hawaiian Hoary Bat and Hawaiian Duck, neither species were observed on-site during the project survey. BMPs in monitoring and mitigation would be implemented during construction to avoid and protect potential impacts to these species and suitable habitats.

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

The Proposed Action would not create adverse effects on air, water or noise conditions at the Project Site. BMPs such as project phasing, erosion control and dust mitigation would be implemented to avoid or minimize short-term impacts of construction activities. Long-term impacts to ambient noise would be consistent with the existing uses and activities in the surrounding area. Building emissions would be negligible and quickly dissipate by northeast trade winds crossing through the

Project Site. Potential impacts from construction and operation activities would remain in compliance with all applicable City and State regulations.

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

The Proposed Action does not anticipate substantial adverse effects or risk of damage from natural hazards at the Project Site. Although the Mānoa Stream runs along the eastern portion of the parcel, no development or operations would occur within the Flood Zone AEF on-site. Built-in flood protections would be used to safeguard the built areas from potential flood damage. The Project Site is located outside of the tsunami evacuation zone and SLR-XA. The housing facility would be constructed to local building codes and enhanced wind design criteria to minimize the potential impacts of natural hazards, such as earthquakes and hurricanes.

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

The Proposed Action would not significantly impact surrounding scenic resources, such as Wa'ahila Ridge and Mānoa Stream or the mauka-makai view planes identified in the City's PUC DP. The project location and design are consistent with existing urban-residential uses in the surrounding area. Both structures of the housing facility will adhere to development guidelines of the City, State and UHM.

- 13) Requires substantial energy consumption or emit substantial greenhouse gases.**

The Proposed Action would incorporate energy saving standards consistent with LEED Silver Certification to minimize long-term energy consumption.

## 8 REFERENCES

AECOS, Inc. 2016. *Biological and Water and Sediment Quality Surveys in Mānoa Stream, Honolulu, Hawai'i*. Biological Surveys. **(AECOS 2016)**

City and County of Honolulu. 2002. *General Plan, Objectives and Policies*. **(CCH 2002)**

City and County of Honolulu, Department of Parks and Recreation. 2020. *Parks: About Us*. Retrieved from: <http://www.honolulu.gov/parks/default/about-us.html>. **(DPR 2020)**

City and County of Honolulu, Department of Planning and Permitting. 2004. *Primary Urban Center Development Plan*. **(DPP 2004)**

City and County of Honolulu, Department of Planning and Permitting. 2002. *The Oahu General Plan*. **(DPP 2002)**

City and County of Honolulu, Department of Planning and Permitting, 2020. *Request for Minor Modification No. 2018/MOD-93 Approval*. 2018/ELOG-1385(GT). **(DPP 2020)**

**Cultural Surveys Hawai'i, Inc. 2008. *Cultural Impact Assessment for the University of Hawai'i at Mānoa Long Range Development Plan Project, Waikiki [Mānoa] Ahupua'a, Kona [Honolulu] District, O'ahu Island*. **(CSH 2008)****

Department of Business, Economic Development & Tourism. 2010. *Census Demographic Profile: Oahu Census Tract*. Retrieved from: [https://census.hawaii.gov/census\\_2010/demographic/demo\\_profile\\_ct\\_oahu/](https://census.hawaii.gov/census_2010/demographic/demo_profile_ct_oahu/). **(DEBDT 2010)**

Department of Planning and Economic Development. 1986. *The Hawai'i State Plan*. Hawai'i State Plan Council. **(DPED 1986)**

Fletcher, C.H., E.E. Grossman, B.M Richmond, A.E. Gibbs. 2002. *Atlas of Natural Hazards in the Hawaiian Coastal Zone*. USGS Geologic Investigations Series I2761. United States Printing Office. **(Fletcher et al. 2002)**

Foote, D., E. Hill, S. Nakamura and F. Stephens. 1972. *Soil Survey of the Islands of Kaua'i, O'ahu, Maui, Molokai, and Lana'i*. State of Hawai'i. U.S. Department of Agriculture. Soil Conservation Service. U.S. Government Printing Office, Washington, D.C. **(Foote et al. 1972)**

Hawaii Department of Health. 2014. *State of Hawai'i Water Quality Monitoring and Assessment Report*. Integrated Report to the U.S. Environmental Protection Agency

- and the U.S. Congress Pursuant to §303(d) and §305(b), Clean Water Act (P.L. 97-117). Clean Water Branch. **(HDOH 2014a)**
- HDOH 2014b. *Hawaii Administrative Rules Title 11 Chapter 54 Water Quality Standards*. **(HDOH 2014b)**
- Mānoa Institutional Research Office, University of Hawaii at Mānoa. *2019-2020 Common Data Set*. Retrieved from: <https://manoa.hawaii.edu/miro/> **(MIRO 2020)**
- Mason. 2020. *State Historic Preservation Division Reconnaissance Level Survey—Survey Form*. **(Mason 2020)**
- Mink, J.F., L.S. Lau. 1987. *Aquifer Identification and Classification for O'ahu: Groundwater Protection Strategy for Hawaii'i*. Technical Report No 179. Water Resources Research Center. **(Mink and Lau 1987)**
- Scientific Consultant Services. 2020. *An Archaeological Literature Review and Field Inspection for the University of Hawaii at Mānoa Multi-Family Site Project Waikīkī Ahupua'a, Honolulu (Kona) District, O'ahu Island, Hawaii'i [TMK: (1) 2-8-023:009]*. **(SCS 2020)**
- State of Hawaii Office of Planning. 1990. *Hawaii Coastal Zone Management Program*. **(OP 1990)**
- Sweet, W.V., R.E. Kopp, C.P. Weaver, J. Obeysekera, R.M. Horton, E.R. Thieler and C. Zervas, 2017: *Global and Regional Sea Level Rise Scenarios for the United States*. NOAA Technical Report NOS CO-OPS 083. NOAA/NOS Center for Operational Oceanographic Products and Services. **(Sweet et al., 2017)**
- United States Department of Agriculture Soil Conservation Service. 2019. *Soil Survey of Islands of Kaua'i, O'ahu, Maui, Molokai, and Lāna'i, State of Hawaii'i*. Natural Resources Conservation Service Soils. Retrieved from: <https://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=HI>. **(USDA SCS 2019)**
- United States Geological Survey (USGS). 1998. *Land Use on the Island of Oahu, Hawaii'i*. Water Resources Investigations Report. Geological Survey. **(USGS 1998)**
- University of Hawaii. 2020. *About the University of Hawaii'i*. Retrieved from: <https://www.hawaii.edu/about-uh/> **(UH 2020)**
- University of Hawaii at Mānoa. 2007. *Long Range Development Plan, University of Hawaii'i, Mānoa Campus 2007 Update*. Prepared by G70. **(UHM 2007)**



# **APPENDIX A**

---

Graduate Student and Faculty Housing Data

## Graduate Student and Faculty Housing Data

### UNIVERSITY OF HAWAI'I AT MĀNOA (UHM) HEADCOUNT SUMMARY

- 2,100+ Faculty
- 1,200+ Graduate Assistants
- 12,800+ Undergraduate Students
- 4,700+ Graduate Students

### UHM FACULTY HOUSING SUMMARY

- To be eligible for University faculty housing, the following criteria must be met:
  - Person is appointed to an O'ahu campus
  - Person's workplace is on O'ahu
  - Person has no real property ownership on O'ahu
- Eligible persons are subject to the following priority schedule and lease terms:

Priority	Rank	Status	Lease Term
1	3	Tenure Track	1 year; may be annually renewed up to a max of 3 years
2	2, 4, 5	Tenure Track	1 year; may be annually renewed up to a max of 3 years
3	2, 3, 4, 5	Tenured	1 year; may be annually renewed up to a max of 3 years
4	N/A	APT	1 year non-renewable
5	N/A	All Others	1 year non-renewable

- Vacancies are assigned first to applicants with initial appointment dates of three years or less; and then to applicants with the lowest salaries, within each respective priority rank
- UHM faculty housing is comprised of 3 apartments/condominium complexes totaling over 200,000 gsf and containing 237 units:

Residence Type	Number of Units	Monthly Rental Range
Studio	13 (5%)	\$700-\$810
1-Bedroom	23 (10%)	\$869-\$1,009
2-Bedroom	160 (68%)	\$1,072-\$1,528
3-Bedroom	41 (17%)	\$1,370-\$2,379
<i>Total</i>	<i>237</i>	

- Occupant Summary at Move-In:

Household Type	Unit Type				Grand Total
	1 - Bedroom	2 - Bedroom	3 - Bedroom	Studio	
Couple	3	66	3	2	74
Family	1	57	37		95
Single	19	31		11	61
Single Parent		6			6
<i>Total</i>	<i>23</i>	<i>160</i>	<i>40</i>	<i>13</i>	<i>236</i>

- From 2013-2017, occupancy has remained above 98%
- In 2008, a Faculty Housing Survey (N=997) found that 52% of faculty surveyed would be interested in moving into UHM faculty housing
  - Of those faculty, 61% ranked below-market rent as one of the top two reasons for their interest; 51% ranked saving for a home with the subsidized rent savings as one of the top two reasons for their interest.

### UHM STUDENT HOUSING SUMMARY

- Approximately 20% of all students (~3,700 students) live on campus
- Of those living on campus, 98% are undergraduates; 2% are graduate students
- 12 residence halls offer 3,870 beds in almost 1 million gross square feet of living space

Residence Type	Number of Units by Occupancy		
	Single	Double	Triple
1-Bedroom	123	833	11
1-Bedroom Suite		112	
1 Bedroom Apartment		79	
2-Bedroom Suite		102	
2-Bedroom Apartment		257	
3-Bedroom Suite		106	
<i>Total</i>	<i>123</i>	<i>1,489</i>	<i>11</i>

- Currently, families reside in 3 2-bedroom apartments
- Average monthly rent by resident type:


	Single Occupancy	Double Occupancy	Triple Occupancy	Quadruple Occupancy	Family Housing Double
Average Monthly Rent	\$1,460	\$1,191	\$611	\$999	\$2,317

# **APPENDIX B**

---

Flora and Fauna Survey





# UH Manoa Multi-Family Housing Project Flora and Fauna Survey Report

JULY 2020

PREPARED FOR

**Belt Collins Hawaii LLC**

PREPARED BY

**SWCA Environmental Consultants**



# UH MANOA MULTI-FAMILY HOUSING PROJECT FLORA AND FAUNA SURVEY REPORT

Prepared for

**Belt Collins Hawaii LLC**  
North King Street, Suite 200  
Honolulu, Hi, 96819  
Attn: Joanne Hiramatsu

Prepared by

Francis Quitazol, James Breedon, and Danielle Frohlich

**SWCA Environmental Consultants**  
1200 Ala Moana Blvd. #380  
Honolulu, Hawai'i 96814  
(808) 892-3842  
[www.swca.com](http://www.swca.com)

SWCA Project No. 61920

July 2020





## SUMMARY

Belt Collins Hawai'i requested that SWCA Environmental Consultants (SWCA) conduct a flora and fauna survey at the proposed Multi-Family Housing project site located on the University of Hawaii at Manoa campus on the island of O'ahu, Hawai'i. This report summarizes the results of the biological resources survey.

SWCA Botanist Danielle Frohlich and Wildlife Biologist James Breeden conducted a flora and fauna survey on June 26, 2020, from 8:00 a.m. to 12:00 p.m., when wildlife species are most likely to be active. All vascular plant species and their relative abundance, as well as vegetation types, were recorded.

No federally or state-listed endangered plant species were observed in or around the survey area. In all, 46 plant species were recorded in the survey area during the time of the survey. Of these, only one species—hala (*Pandanus tectorius*)—is possibly native to the Hawaiian Islands, and three species—coconut (*Cocos nucifera*), kukui (*Aleurites moluccana*), and ti (*Cordyline fruticosa*)—were introduced by Polynesian people prior to European contact (Wagner et al. 1999). The vegetation types and plant species identified during the survey are not considered unique. Therefore, the proposed project is not expected to have a significant, adverse effect on terrestrial vegetation.

No federally and one state listed species—the threatened White tern (*Gygis alba*)—were observed in and around the survey area. Although not observed, one federally and state endangered mammal, Hawaiian hoary bat (*Lasiurus cinereus semotus*), and two additional federally and state endangered bird, Hawaiian stilt (*Himantopus mexicanus knudseni*) and Hawaiian duck (*Anas wyvilliana*), could occur in the survey area based on the available habitat in the survey area. All other federally or state-listed species with potential to occur on the Island of O'ahu are not likely to occur in the survey area because it is either outside the range of the species or because appropriate habitat does not occur. Therefore, the proposed project is not expected to have a significant, adverse effect on terrestrial wildlife.

*This page intentionally left blank.*

## CONTENTS

<b>Introduction</b> .....	<b>1</b>
<b>Methods</b> .....	<b>1</b>
Flora Surveys.....	1
Fauna Surveys .....	1
<b>Results</b> .....	<b>1</b>
Flora .....	3
Streamside Ruderal Vegetation.....	3
Landscaped Vegetation.....	4
Fauna .....	5
Avifauna.....	5
Mammals .....	6
Reptiles and Amphibians .....	6
Invertebrates.....	7
<b>Discussion and Recommendations</b> .....	<b>7</b>
Flora .....	7
Fauna .....	7
Migratory Bird Treaty Act.....	8
Special-Status Species .....	8

## Appendices

Appendix A. Checklist of Plants Observed at University of Hawai‘i Mānoa Multi-Family Housing Project Survey Area on June 26, 2020.

## Figures

Figure 1. Survey area .....	2
Figure 2. Image of Streamside Ruderal Vegetation type showing coconut ( <i>Cocos nucifera</i> ), parasol tree ( <i>Macaranga tanarius</i> ), and Chinese banyan ( <i>Ficus microcarpa</i> ) in the overstory, Arabian coffee ( <i>Coffea arabica</i> ) in the midstory, and coral berry ( <i>Rivina humilis</i> ) and Guinea grass ( <i>Urochloa maxima</i> ) in the herbaceous layer. ....	4
Figure 3. Photograph of Landscaped Vegetation type, showing oleander ( <i>Nerium oleander</i> ), Cape plumbago ( <i>Plumbago auriculata</i> ), monkeypod ( <i>Samanea saman</i> ), and Bermuda grass ( <i>Cynodon dactylon</i> ).....	5

## Tables

Table 1. Birds observed by SWCA in and near the survey area .....	6
---	---

*This page intentionally left blank.*



## INTRODUCTION

Belt Collins Hawai'i requested that SWCA Environmental Consultants (SWCA) conduct a flora and fauna survey at the proposed Multi-Family Housing project site located on the University of Hawaii at Manoa campus on the island of O'ahu, Hawai'i (Figure. 1). This report summarizes the results of the biological resources survey conducted on June 26, 2020.

## METHODS

SWCA conducted a review of available scientific and technical literature regarding natural resources in and near the survey area. This literature review encompassed a thorough search of scientific journals, technical journals, and reports, environmental assessments, environmental impact statements, relevant government documents, the U.S. Fish and Wildlife Service (USFWS) online database, and unpublished data that provide insight into the area's natural history and ecology. SWCA also reviewed available geospatial data, aerial photographs, and topographic maps of the survey area.

### Flora Surveys

SWCA conducted a pedestrian flora (botanical) survey on June 26, 2020, to document all vascular plant species and vegetation types. Areas more likely to support native plants (e.g., rocky outcrops and shady areas) were more intensively examined.

Plants recorded during the survey are indicative of the season ("rainy" versus "dry") and the environmental conditions at the time of the survey. It is likely that additional surveys conducted at a different time of the year would result in minor variations in the species and abundance of plants observed.

### Fauna Surveys

SWCA conducted the pedestrian fauna survey on June 26, 2020, during the morning hours (8:00 a.m. to 12:00 p.m.), when wildlife are most likely to be active. Visual and auditory observations were included in the survey. Field observations of birds were conducted using 10 × 42-mm binoculars. All observed birds, mammals, reptiles, amphibians, and invertebrate species were noted during the survey. Species-specific surveys were not conducted, but areas of suitable habitat for listed species were noted during the survey.

## RESULTS

The survey area does not encompass any designated or proposed critical habitat for threatened or endangered species. No federally listed threatened, endangered, or candidate animals were observed during the pedestrian surveys. However, the federally endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) may forage or roost (described in detail below), and the state threatened white tern (*Gygis alba*) may nest in the survey area.

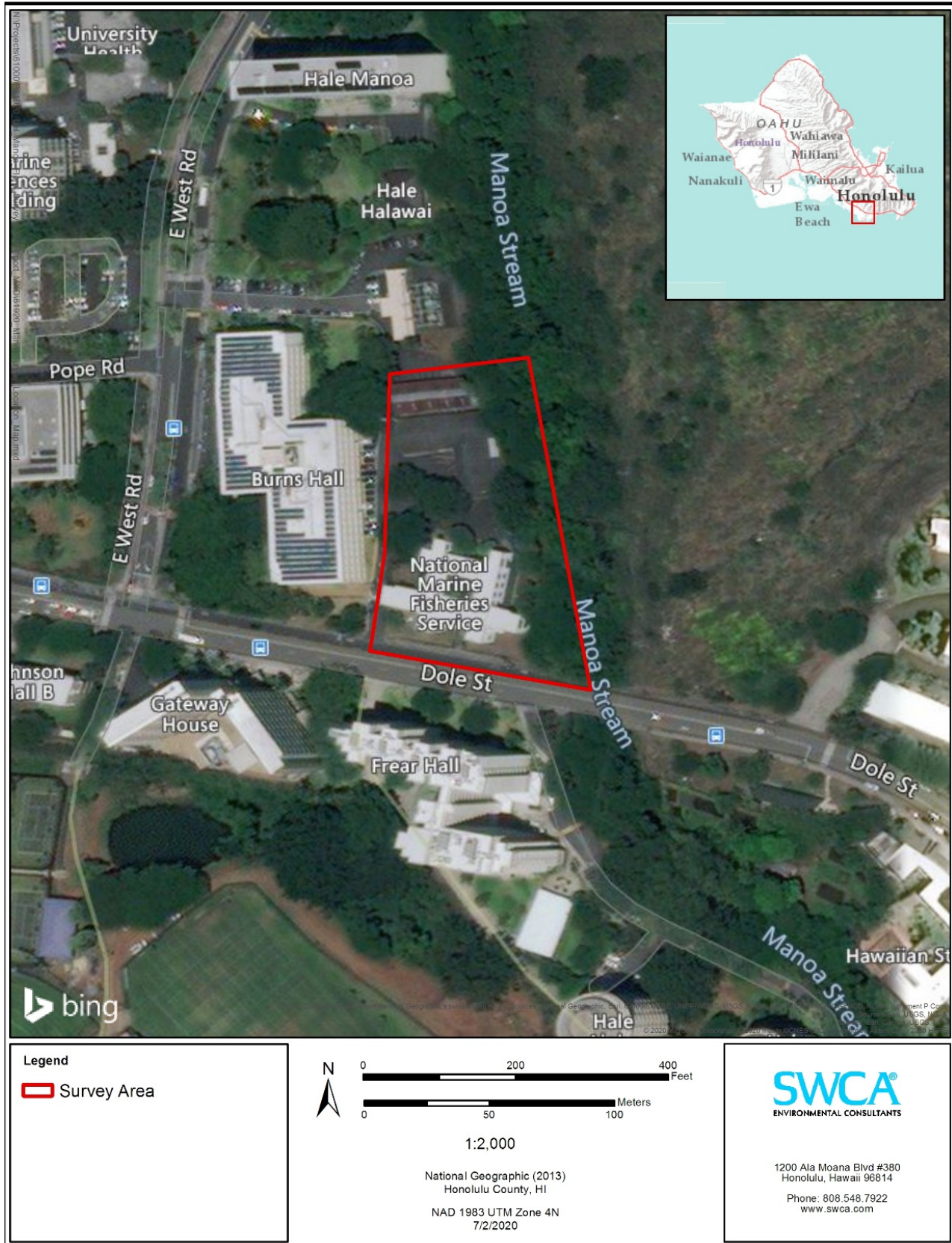


Figure 1. Survey area

## Flora

No federally and state-listed threatened, endangered, or candidate plant species, or rare native Hawaiian plant species, were observed in the survey area. In all, 46 plant species were recorded in the survey area during the time of the survey. Of these, only one species—hala (*Pandanus tectorius*)—is possibly native to the Hawaiian Islands, and three species—coconut (*Cocos nucifera*), kukui (*Aleurites moluccana*), and ti (*Cordyline fruticosa*)—were introduced by Polynesian people prior to European contact (Wagner et al. 1999).<sup>1</sup> Appendix A provides a list of all plant species observed by the SWCA botanist in the survey area during the June 26, 2020, survey.

The vegetation in the survey area consists of two vegetation types: streamside ruderal, and landscaped.

### **Streamside Ruderal Vegetation**

This vegetation type is found along Mānoa Stream on the east side of the project site. The plant species found in this vegetation type are non-natives adapted to colonizing disturbed, streamside areas. The most common tree species in this vegetation type are parasol tree (*Macaranga tanarius*), Chinese banyan (*Ficus microcarpa*), and coconut (*Cocos nucifera*). Shrub species include koa haole (*Leucaena leucocephala*) and Arabian coffee (*Coffea arabica*). Abundant herbaceous and grass species found in the ruderal vegetation type are coral berry (*Rivina humilis*), white shrimp plant (*Justicia betonica*), and Guinea grass (*Urochloa maxima*). Balloon vine (*Cardiospermum halicacabum*), a rampant, smothering vine, is occasionally seen in the understory (Figure 2).

---

<sup>1</sup> The taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999), Wagner and Herbst (2003), and Staples and Herbst (2005). Recent name changes are those recorded in Wagner et al. (2012). Common/Hawaiian names are provided first, followed by scientific names in parenthesis. If no common or Hawaiian name is known, only the scientific name is provided.





**Figure 2.** Image of Streamside Ruderal Vegetation type showing coconut (*Cocos nucifera*), parasol tree (*Macaranga tanarius*), and Chinese banyan (*Ficus microcarpa*) in the overstory, Arabian coffee (*Coffea arabica*) in the midstory, and coral berry (*Rivina humilis*) and Guinea grass (*Urochloa maxima*) in the herbaceous layer.

### ***Landscaped Vegetation***

This vegetation type consists of common ornamental species, including plumeria (*Plumeria rubra*), hibiscus (*Hibiscus rosa-sinensis*), oleander (*Nerium oleander*), monkeypod (*Samanea saman*), and Bermuda grass (*Cynodon dactylon*), all planted around the perimeter of buildings (Figure 3).





**Figure 3.** Photograph of Landscaped Vegetation type, showing oleander (*Nerium oleander*), Cape plumbago (*Plumbago auriculata*), monkeypod (*Samanea saman*), and Bermuda grass (*Cynodon dactylon*).

## Fauna

In general, most of the wildlife species expected to occur in the study area include assemblages that are found in low-elevation to mid-elevation areas on O‘ahu approximately 100 feet above sea level. One state-listed species, the white tern (*Gygis alba*), was observed and based on the available habitat the Hawaiian hoary bat is expected to occur. Although not observed during the survey, federally and state-listed waterbird species may occasionally fly over the survey area. The survey area does not encompass any designated or proposed critical habitat for threatened or endangered species.

## Avifauna

The birds observed in the survey area are species commonly found in and around Hawai‘i’s urban areas and in the gardens and waterways on O‘ahu. In all, 14 bird species were documented (Table 1). Two native birds were documented: the black-crowned night heron (*Nycticorax nycticorax*) and white tern. The remaining bird species are non-native introductions. The black-crowned night heron cattle egret (*Bubulcus ibis*), house finch (*Haemorhous mexicanus*), and white tern are protected by the Migratory Bird Treaty Act (MBTA). The MBTA-protected birds, including the white tern, are discussed in more detail below.

Other MBTA species that may occur in the survey area but were not detected include the migrant Pacific golden-plover (*Pluvialis fulva*), wandering tattler (*Tringa incana*), and the feral mallard (*Anas platyrhynchos*). The migrant Pacific golden-plover and wandering tattler overwinter during the non-breeding season and do not nest in Hawai‘i. The feral mallard is a non-native permanent resident.

Foraging habitat for the federal and state-listed Hawaiian coot (*Fulica alai*), Hawaiian moorhen (*Gallinula galeata sandvicensis*), and Hawaiian stilt (*Himantopus mexicanus knudseni*) does not occur in the survey area. However, suitable forage and nest habitat does occur for the federal and state-listed Hawaiian duck (*Anas wyvilliana*). Collectively these species are referred to as Hawaiian waterbirds and their potential to occur in the survey area is discussed in more detail below.

**Table 1. Birds observed by SWCA in and near the survey area**

Common Name	Scientific Name	Status*	Protected by the MBTA
Black-crowned night-heron	<i>Nycticorax</i>	N	X
Brazilian Cardinal	<i>Paroaria coronata</i>	NN	
Cattle egret	<i>Bubulcus ibis</i>	NN	X
Common myna	<i>Acridotheres tristis</i>	NN	
Common waxbill	<i>Estrilda astrild</i>	NN	
House finch	<i>Haemorhous mexicanus</i>	NN	X
House sparrow	<i>Passer domesticus</i>	NN	
Japanese white-eye	<i>Zosterops japonicus</i>	NN	
White-rumped Shama	<i>Copsychus malabaricus</i>	NN	
Red-vented bulbul	<i>Pycnonotus cafer</i>	NN	
Ring-necked parakeet	<i>Psittacula krameri</i>	NN	
Spotted dove	<i>Streptopelia chinensis</i>	NN	
White tern	<i>Gygis alba</i>	N, ST	X
Zebra dove	<i>Geopelia striata</i>	NN	
<b>Total</b>		<b>14</b>	<b>4</b>

\* N = Native, NN = Non-native permanent resident, ST = State Threatened

## Mammals

The survey area is located on a college campus in an urban setting where it is common to find people walking pet dogs (*Canis familiaris*). Other mammals that were observed include the feral cat (*Felis catus*) and small Indian mongoose (*Herpestes javanicus*). Rodents such as the house mouse (*Mus musculus*) and rats (*Rattus* spp.) were not observed but are expected to occur. Although no other mammals were observed during the survey, forage and roost habitat is present for the Hawaiian hoary bat, and this species is expected to be present.

## Reptiles and Amphibians

No reptiles or amphibians were detected during the survey. No terrestrial reptiles and amphibians are native to the Hawaiian Islands.

## **Invertebrates**

The cabbage white butterfly, long legged ant (*Anoplolepis longipes*), and aedes mosquito (*Aedes sp.*). No native invertebrates were recorded during the survey.

## **DISCUSSION AND RECOMMENDATIONS**

### **Flora**

Overall, the vegetation in the survey area is disturbed from previous and current land-use activities. The vegetation types and species identified are not considered unique. All but one of the 46 plant species observed are not native to the Hawaiian Islands, and the one possibly native species observed is of questionable indigenous status and is common throughout the Hawaiian Islands. No threatened or endangered plants were found during the survey, and no designated plant critical habitat occurs in the area. Therefore, the proposed project is not expected to have a significant, adverse effect on flora (botanical) resources.

Weedy, non-native plant species are common in the survey area. Most of these weedy species are widespread in Hawai'i, and their removal from this site would not be expected to result in a significant decrease in their overall number or distribution. However, construction activities are known to spread invasive species to new areas through the movement of vehicles and materials. For this reason, SWCA recommends the following invasive species minimization measures to avoid the unintentional introduction or transport of new terrestrial invasive species to O'ahu:

- All construction equipment and vehicles arriving from outside O'ahu should be washed and inspected before entering the project area.
- Construction materials arriving from outside of O'ahu should also be washed and/or visually inspected (as appropriate) for excessive debris, plant materials, and invasive or harmful non-native species (plants, amphibians, reptiles, and insects).
- Inspection and cleaning activities should be conducted at a designated location. The inspector should be a qualified botanist and/or entomologist who is able to identify invasive species that are of concern relevant to the point of origin of the equipment, vehicle, or material.
- When possible, raw materials (e.g., fill and construction materials) should be purchased from a local supplier on O'ahu to avoid introducing non-native species not present on the island.

If landscaping occurs as part of the project, native Hawaiian plants or non-invasive plants should continue to be used to the maximum extent possible. If native plants do not meet landscaping objectives, plants with a low risk of becoming invasive could be substituted. Additional information on selecting appropriate plants for landscaping can be obtained from the following online sources:

- Plant Pono: <http://www.plantpono.org/>
- Native Plants Hawai'i: <http://nativeplants.hawaii.edu/>

### **Fauna**

MBTA and special-status species and their avoidance and minimization measures are discussed below. If the proposed project follows these avoidance and minimization measures, all direct impacts can be avoided.

## **Migratory Bird Treaty Act**

During this survey, SWCA observed four bird species that are federally protected under the MBTA (Table 1). Construction at the site may temporarily displace some of these bird species, but long-term impacts are not expected. These birds (likely limited to a few individuals) are expected to find suitable foraging habitat in nearby areas. The temporary displacement of these individuals at the project site is not expected to affect individual survival or the overall species populations.

The house finch is known to nest in Hawaii from March through July (Badyaev et al. 2020). Months of nesting in Hawaii could not be found for black-crowned night heron (*Nycticorax nycticorax*) and cattle egret (*Bubulcus ibis*).

Direct impacts to MBTA-protected birds could occur if active nests are disturbed or damaged during vegetation removal. To prevent direct impacts to these MBTA-protected birds, the following measures are recommended:

- A nesting bird survey should be conducted by a qualified biologist within 72 hours prior to initiating construction activities during the nesting bird season, and after a break in construction for more than three (3) consecutive days throughout the nesting season.
- If found, active nests should be left in place and undisturbed until chicks have fledged. A qualified biologist should monitor active nests during construction activities to reduce the chances of nest abandonment by temporarily shutting down construction activities that disrupt the normal daily patterns of the birds.

## **Special-Status Species**

Special-status species refers to species that are state or federally listed threatened, endangered, proposed, or candidate species or rare species. Habitat and known range were used to determine the likelihood of special-status species to occur if their presence was not detected.

## **HAWAIIAN WATERBIRDS**

The Hawaiian coot, Hawaiian moorhen, Hawaiian stilt, and Hawaiian duck constitute the Hawaiian waterbird group. Because these species share similar habitat needs and biological characteristics, they are discussed as a single group. Hawaiian waterbirds are most likely to be found in areas associated with wetlands and waterways, such as in or near the streamside ruderal vegetation type, and Manoa stream habitats. These waterbirds are found in a variety of wetland habitats such as freshwater marshes and ponds, coastal estuaries and ponds, artificial reservoirs, kalo or taro (*Colocasia esculenta*) lo'i or patches, irrigation ditches, sewage treatment ponds, and, in the case of the Hawaiian duck, montane streams and marshlands.

Habitat for the Hawaiian coot, Hawaiian moorhen, and Hawaiian stilt does not occur in the survey area, but it does occur in the kalo patches approximately 215 feet southeast of the survey area. Hawaiian duck foraging habitat occurs in the Manoa stream and nest habitat occurs in the streamside ruderal and landscaped vegetation types in the survey area. However, Hawaiian ducks are unlikely to occur in the survey area because on O'ahu they have hybridized with feral mallards (Fowler et al. 2009, USFWS 2011).

Because suitable forage and nest habitat occurs adjacent to the survey area, construction activities that create temporary or permanent standing water may attract Hawaiian waterbirds and result in nesting



(USFWS 2020). Therefore, the following avoidance and minimization measure is recommended to avoid impacts to these species:

- Construction activities that create the potential for temporary or permanent standing water should be avoided.

If construction activities are found to create temporary or permanent standing water in the survey area, the following avoidance and minimization measures are recommended:

- In areas where emergent vegetation or other waterbird nesting habitat would be disturbed, waterbird nest searches will be conducted by a qualified biologist before any work is conducted and after any subsequent delay in work of 3 or more days (during which birds may attempt nesting).
- In areas where waterbirds are known to occur, speed limit signs will be posted and followed.
- Waterbird nests, chicks, or broods found in the survey area will be reported to the USFWS within 24 hours and a 100-foot buffer will be maintained until the chicks/ducklings have fledged.
- If an active nest or brood is found, a biological monitor will be present at the construction site during all construction activities to ensure that Hawaiian waterbirds and nests are not adversely impacted.

## WHITE TERN

On O‘ahu, white terns have been documented nesting in 58 tree species; of these tree species, white terns most commonly nest in monkeypod (*Samanea saman*), shower trees (*Cassia* sp.), kukui (*Aleurites moluccana*), Chinese banyan (*Ficus microcarpa*), West Indian mahogany (*Swietenia mahagoni*), and Indian banyan (*Ficus benghalensis*) (Liu et al. 2019). Trees used by the white tern on O‘ahu range from 6 to 116 inches in diameter (Liu et al. 2019). The white tern lays eggs directly on branches; thus, eggs and flightless chicks are highly vulnerable to tree trimming and removal activities (Vanderwerf 2003). No nest is made; instead, white terns lay a single egg directly on a bare surface. In Hawai‘i, nesting occurs year-round but most eggs are laid between late January and June, with peak egg laying between March and April (Liu et al. 2019). Indicators that white terns are present include accumulation of white feathers and/or white fecal material beneath a tree (USFWS 2020).

Two trees in the survey area are known to support white tern nesting (Hui Manu-o-Kū 2020). No nesting was observed during the survey. However, one pair of white terns was observed perched on the utility lines above one of the known nest trees. In addition, approximately 10–12 white terns were flying over and around the survey area. Although white terns are tolerant of people and noise, the following actions are recommended to avoid impacts to this species:

- Inspect all trees selected to be cut to determine if nesting white terns are present.
- A white tern nest survey should be conducted by a qualified biologist within 72 hours prior to initiating construction activities during the white tern nesting season, and after a break in construction for more than three (3) consecutive days throughout the nesting season.
- Do not trim trees or remove branches from trees where white terns are actively nesting.
- Do not disturb an active white tern nest nesting tree or branch for at least 80 days for at least as long as the nesting tree or branch remains active as determined by a qualified biologist.

## HAWAIIAN HOARY BAT

While no bats or bat sign were observed during the survey effort, the presence of suitable foraging and roosting habitat onsite indicate there is high potential for Hawaiian hoary bats to occur. The Hawaiian hoary bat is known to occur on all of the main Hawaiian Islands, and has been observed from sea level to approximately 13,000 feet (DLNR 2015a, 2015b). Hawaiian hoary bats use both closed habitats near vegetation such as tunneled roadways, and open habitats adjacent to forests, above tree canopies, and over open oceans (Jacobs 1996). Hawaiian hoary bats are insectivores and are regularly observed foraging over streams, reservoirs, and wetlands up to 300 feet offshore (U.S. Department of Agriculture 2009). Hawaiian hoary bats forage in open, wooded, and linear habitats within a wide range of vegetation types (USFWS 1998). The bat typically roosts in dense canopy foliage or in the subcanopy when canopy is sparse, with open access for launching into flight (U.S. Department of Agriculture 2009). Hawaiian hoary bats forage height ranges from 3 feet to above 500 feet above ground level, and the bats can become entangled in barbed wire used for fencing (USFWS 2020). The Hawaiian hoary bat could forage over streamside ruderal and landscaped vegetation types in the survey area and could roost in any of the trees 15 feet or taller. However, direct impacts to bats would only occur if a juvenile bat that is too small to fly but too large to be carried by a parent were present in a tree that was cut down. Implementation of the following avoidance and minimization measures is expected to avoid all project-related direct impacts to Hawaiian hoary bats:

- If felling of standing trees occurs during the bat breeding season, direct impacts could occur to juvenile bats that are too small to fly but too large to be carried by a parent. To minimize this impact, no trees taller than 15 feet should be trimmed or removed between June 1 and September 15.
- The use of barbless top-strand wire is recommended for all fence construction to avoid entanglement of Hawaiian hoary bat (*Lasiurus cinereus semotus*).

## LITERATURE CITED

- Badyaev, A. V., V. Belloni, and G. E. Hill (2020). House Finch (*Haemorhous mexicanus*), version 1.0. In *Birds of the World* (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.
- Fowler, A. C., J. M. Eadie, and A. Engilis. 2009. Identification of Endangered Hawaiian Ducks (*Anas wyvilliana*), Introduced North American Mallards (*Anas platyrhynchos*) and Their Hybrids using Multilocus Genotypes. *Conservation Genetics* 10:1747–1758.
- Hawai‘i Department of Land and Natural Resources (DLNR). 2015a. Hawai‘i’s State Wildlife Action Plan. Prepared by H. T. Harvey and Associates, Honolulu, Hawai‘i. Available at : <https://dlnr.hawaii.gov/wildlife/files/2016/12/HI-SWAP-2015.pdf>. Accessed on June 25, 2020.
- . 2015b. Endangered Species Recovery Committee. Hawaiian Hoary Bat Guidance Document. Available at: [https://dlnr.hawaii.gov/wildlife/files/2018/07/Bat-White-Paper-Guidance\\_2015-FINAL.pdf](https://dlnr.hawaii.gov/wildlife/files/2018/07/Bat-White-Paper-Guidance_2015-FINAL.pdf). Accessed on June 25, 2020.
- Liu, A., K. Swindle, R. Downs, and E. Vanderwerf. 2019. Tree Care Guidelines and Best Practices for Manu-o-Kū Breeding Sites. Available at: [https://www.whiteterns.org/uploads/8/6/3/2/86323044/mok\\_tree\\_care\\_guidelines\\_190622.pdf](https://www.whiteterns.org/uploads/8/6/3/2/86323044/mok_tree_care_guidelines_190622.pdf). Accessed on June 25, 2020.
- Staples, G. W., and D. R. Herbst. 2005. *A Tropical Garden Flora: Plants Cultivated in the Hawaiian Islands and Other Tropical Places*. Honolulu, Hawai‘i: Bishop Museum Press.
- U.S. Department of Agriculture. 2009. *Bats of the U.S. Pacific Islands*. Biology Technical Note No. 20. Natural Resources Conservation Service, Pacific Islands Area.
- U.S. Fish and Wildlife Service (USFWS). 1998. *Recovery Plan for the Hawaiian Hoary Bat (Lasiurus cinereus semotus)*. Portland, Oregon: USFWS Region 1.
- . 2020. Pacific Islands Fish and Wildlife Office: Avoidance and Minimization Measures. Available online at <https://www.fws.gov/pacificislands/promo.cfm?id=177175840>. Accessed June 25, 2020.
- Vanderwerf, E. 2003. Distribution, Abundance, and Breeding Biology of White Terns on Oahu, Hawaii. *The Wilson Bulletin* 115(3):258–262.
- Wagner, W. L., D. R. Herbst, and S. H. Sohmer. 1999. *Manual of the Flowering Plants of Hawai‘i*. Volumes I and II. Revised edition. Honolulu: University of Hawai‘i Press.
- Wagner, W. L., and D. R. Herbst. 2003. *Supplement to the Manual of the Flowering Plants of Hawai‘i*. Version 3.1. Honolulu: University of Hawai‘i Press.
- Wagner, W. L., D. R. Herbst, N. Khan, and T. Flynn. 2012. *Hawaiian Vascular Plant Updates: A Supplement to the Manual of the Flowering Plants of Hawai‘i and Hawai‘i’s Ferns and Fern Allies*. Version 1.3. Honolulu: University of Hawai‘i Press.

## **APPENDIX A**

**Checklist of Plants Observed at University of Hawai'i Mānoa  
Multi-Family Housing Project Survey Area on June 26, 2020**





Table A-1 provides an inventory checklist of plant species observed by SWCA Environmental Consultants on June 26, 2020, at the University of Hawai‘i Mānoa Multi-Family Housing Project survey area. The plant names are arranged alphabetically by family and then by species into two groups: monocots and dicots. The taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999), Wagner and Herbst (2003), and Staples and Herbst (2005). Recent name changes are those recorded in Wagner et al. (2012).

**Table A-1. Checklist of Plants Observed at University of Hawai‘i Mānoa Multi-Family Housing Project Survey Area on June 26, 2020.**

Family	Scientific Name and Authorship	Status	Hawaiian and/or Common Name
<b>MONOCOTS</b>			
Agavaceae	<i>Cordyline fruticosa</i> (L.) A.Chev.	P	ki, ti
Agavaceae	<i>Sansevieria trifasciata</i> Prain	X	snake plant
Aloeaceae	<i>Aloe vera</i> (L.) Burm.f.	X*	aloe
Araceae	<i>Epipremnum pinnatum</i> (L.) Engl.	X*	taro vine, pothos, golden pothos
Arecaceae	<i>Adonidia merrillii</i> (Becc.) Becc..	X*	Manila palm
Arecaceae	<i>Cocos nucifera</i> L.	P	niu, coconut
Cyperaceae	<i>Cyperus involucratus</i> Rottb.	X	umbrella sedge
Pandanaceae	<i>Pandanus tectorius</i> Parkinson ex Z	I?	hala, pū hala, screwpine
Poaceae	<i>Bothriochloa pertusa</i> (L.) A.Camus	X	pitted beardgrass
Poaceae	<i>Cynodon dactylon</i> (L.) Pers.	X	Bermuda grass
Poaceae	<i>Urochloa maxima</i> (Jacq.) R.D.Webster	X	Guinea grass
<b>DICOTS</b>			
Acanthaceae	<i>Asystasia gangetica</i> (L.) T.Anderson	X	Chinese violet, coromandel
Acanthaceae	<i>Justicia betonica</i> L.	X	white shrimp plant, squirrel's-tail
Acanthaceae	<i>Odontonema cuspidatum</i> (Nees) Kuntze	X	
Amaranthaceae	<i>Alternanthera pungens</i> Kunth	X	khaki weed
Anacardiaceae	<i>Mangifera indica</i> L.	X	mango, manakō, manakō meneke, meneke
Apocynaceae	<i>Nerium oleander</i> L.	X*	oleander
Apocynaceae	<i>Plumeria rubra</i> L.	X*	plumeria
Araliaceae	<i>Schefflera actinophylla</i> (Endl.) Harms	X	octopus tree, umbrella tree
Asteraceae	<i>Tridax procumbens</i> L.	X	coat buttons
Bignoniaceae	<i>Macfadyena unguis-cati</i> (L.) A.H.Gentry	X	cat's-claw climber

**Table A-1. Checklist of Plants Observed at University of Hawai'i Mānoa Multi-Family Housing Project Survey Area on June 26, 2020.**

Family	Scientific Name and Authorship	Status	Hawaiian and/or Common Name
Bignoniaceae	<i>Spathodea campanulata</i> P.Beauv.	X	African tulip tree
Boraginaceae	<i>Carmona retusa</i> (Vahl) Masam.	X	Fukien tea
Convolvulaceae	<i>Merremia aegyptia</i> (L.) Urb.	X	hairy merremia
Euphorbiaceae	<i>Aleurites moluccana</i> (L.) Willd.	P	kukui, candlenut
Euphorbiaceae	<i>Breynia disticha</i> cv. 'Roseo-picta'	X*	snowbush
Euphorbiaceae	<i>Codiaeum variegatum</i> (L.) Blume	X*	croton
Euphorbiaceae	<i>Euphorbia hirta</i> L.	X	hairy spurge, garden spurge
Euphorbiaceae	<i>Macaranga tanarius</i> (L.) Müll.Arg.	X	parasol leaf tree
Fabaceae	<i>Indigofera spicata</i> Forssk.	X	creeping indigo
Fabaceae	<i>Leucaena leucocephala</i> (Lam.) de Wit	X	koa haole
Fabaceae	<i>Samanea saman</i> (Jacq.) Merr.	X*	monkeypod, rain tree
Lauraceae	<i>Cinnamomum burmanni</i> (Nees) Blume	X	padang cassia
Malvaceae	<i>Hibiscus rosa-sinensis</i> L.	X*	hibiscus
Moraceae	<i>Ficus microcarpa</i> L.f.	X	Chinese banyan, Malayan banyan
Myrtaceae	<i>Melaleuca quinquenervia</i> (Cav.) S.T.Blake	X	paperbark
Myrtaceae	<i>Syzygium cumini</i> (L.) Skeels	X	Java plum
Ochnaceae	<i>Ochna thomasi</i> Engl. & Gilg	X	
Oleaceae	<i>Jasminum multiflorum</i> (Burm.f.) Andrews	X	
Oleaceae	<i>Noronhia emarginata</i> (Lam.) Poir.	X	
Phytolaccaceae	<i>Rivina humilis</i> L.	X	coral berry, rouge plant
Plumbaginaceae	<i>Plumbago auriculata</i> Lam.	X*	cape leadwort
Rubiaceae	<i>Coffea arabica</i> L.	X	Arabian coffee
Rutaceae	<i>Murraya paniculata</i> (L.) Jack	X	
Sapindaceae	<i>Cardiospermum halicacabum</i> L.	X	heartseed, balloon vine
Sapindaceae	<i>Filicium decipiens</i> (Wight & Arn.) Thwaites	X	fern tree

**LEGEND:** P - Polynesian introduced, P? - probably Polynesian introduced but possibly introduced in historic times, I - indigenous, I? - probably indigenous but possibly naturalized, E - endemic, E? - probably endemic but possibly naturalized, X - non-native, X\*- non-native cultivate

# **APPENDIX C**

---

Archaeological Literature Review and Field Inspection Report

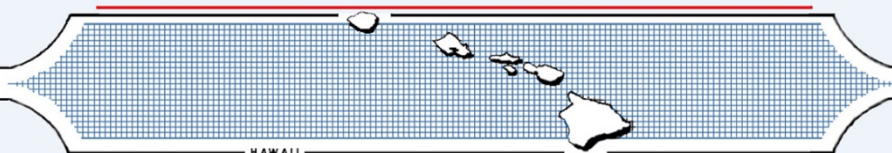


**AN ARCHAEOLOGICAL LITERATURE REVIEW AND FIELD INSPECTION  
FOR THE UNIVERSITY OF HAWAI‘I AT MĀNOA MULTI-FAMILY SITE PROJECT  
WAIKĪKĪ AHUPUA‘A, HONOLULU (KONA) DISTRICT, O‘AHU ISLAND, HAWAI‘I  
[TMK: (1) 2-8-023:009]**

Prepared by:  
**Michael J. Woodburn, M.A.,**  
**Thomas Dols, M.A.**  
and  
**Morgan E. Davis, M.A.**  
April 2020  
**FINAL**

Prepared for:  
**Joanne Hiramatsu**  
**Belt Collins Hawaii LLC**  
**2153 North King Street**  
**Suite 200**  
**Honolulu, HI 96819**

**SCIENTIFIC CONSULTANT SERVICES, Inc.**



1347 Kapiolani Blvd., Suite 408 Honolulu, Hawai‘i 96814

## **ABSTRACT**

At the request of Joanne Hiramatsu of Belt Collins Hawaii LLC, on behalf of the University of Hawai‘i at Mānoa, Scientific Consultant Services, Inc. (SCS) has prepared this Archaeological Literature Review and Field Inspection in advance for the proposed University of Hawai‘i at Mānoa (UHM) Multi-Family Housing Project, Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu Island, Hawai‘i [TMK: (1) 2-8-023:009]. The proposed 2.21-acre project includes the demolition of existing buildings on the property in order to construct one building consisting of two towers, one tower at 14-stories tall and the other tower at 18-stories tall, for graduate student and staff housing consisting of approximately 388 individual units. Historical research and previous archaeological studies indicate that areas near and within the current project area were utilized throughout the Historic period for agriculture and/or scattered human habitation. In addition, traditional Hawaiian burials were also found these areas as isolated and clusters. As such, there is potential for subsurface archaeological cultural deposits, and possibly human burials, to exist within the current project area. Given that the project area was occupied during the historical period and that no archaeological testing was conducted within the project area, an archaeological inventory survey (AIS) is recommended with subsurface testing as the current buildings will be demolished and replaced with the new building. It is also recommended that consultation with the State Historic Preservation Division (SHPD) concerning the archaeological testing occur prior to the start of the AIS project.

## TABLE OF CONTENTS

<b>ABSTRACT.....</b>	<b>i</b>
<b>LIST OF FIGURES .....</b>	<b>iii</b>
<b>LIST OF TABLES .....</b>	<b>iii</b>
<b>INTRODUCTION .....</b>	<b>1</b>
<b>ENVIRONMENTAL SETTING .....</b>	<b>5</b>
<b>PROJECT AREA LOCATION.....</b>	<b>5</b>
<b>CLIMATE .....</b>	<b>5</b>
<b>SOILS.....</b>	<b>5</b>
<b>VEGETATION .....</b>	<b>7</b>
<b>BUILT ENVIRONMENT .....</b>	<b>7</b>
<b>BACKGROUND RESEARCH.....</b>	<b>7</b>
<b>TRADITIONAL HISTORY .....</b>	<b>7</b>
<b>PAST POLITICAL BOUNDARIES .....</b>	<b>8</b>
<b>TRADITIONAL SETTLEMENT PATTERNS.....</b>	<b>9</b>
<b>LATE POST-CONTACT PERIOD .....</b>	<b>11</b>
<b>LATE 19<sup>TH</sup> TO 20<sup>TH</sup> CENTURY .....</b>	<b>14</b>
<b>PREVIOUS ARCHAEOLOGY.....</b>	<b>22</b>
<b>ARCHAEOLOGICAL FIELD METHODS .....</b>	<b>26</b>
<b>RESULTS OF ARCHAEOLOGICAL FIELD INSPECTION .....</b>	<b>27</b>
<b>SUMMARY AND CONCLUSIONS .....</b>	<b>29</b>
<b>REFERENCES.....</b>	<b>30</b>
<b>APPENDIX A: LCA DOCUMENTATION .....</b>	<b>A</b>
<b>APPENDIX B: FIELD INSPECTION PHOTOGRAPHS.....</b>	<b>B</b>

## LIST OF FIGURES

<b>Figure 1: 1998 United States Geological Survey Honolulu quadrangle map showing the location of the project area parcel in yellow.....</b>	<b>2</b>
<b>Figure 2: TMK: (1) 2-8-023 showing the location of the project area parcel in yellow. ....</b>	<b>3</b>
<b>Figure 3: 2013 Google Earth aerial photograph showing the location of the project area parcel in yellow.....</b>	<b>4</b>
<b>Figure 4: Google Earth aerial photograph (2013) showing soil series in the project area and the vicinity.....</b>	<b>6</b>
<b>Figure 5: Project area location on the Dove 1892 map of Honolulu. The approximate location of the project area parcel is shown in yellow.....</b>	<b>12</b>
<b>Figure 6: Land Commission Awards in and surrounding the project area. ....</b>	<b>15</b>
<b>Figure 7: Project area location on the 1899 map of Oahu (Taylor 1899). The quarry is identified to the southwest of the approximate location of the project area parcel (which is indicated in yellow). ....</b>	<b>17</b>
<b>Figure 8: Project area location on the Monsarrat 1901 map of Honolulu. Note the lack of development in the vicinity of the project area (approximate location marked in yellow). ....</b>	<b>18</b>
<b>Figure 9: Project area location on the 1920 Monsarrat map of Honolulu. Note the quarry is still noted on this map to the southwest of the approximate location of the project area, identified in yellow. ....</b>	<b>19</b>
<b>Figure 10: 1927 USGS Honolulu Quadrangle Map showing Project Area Location. ....</b>	<b>20</b>
<b>Figure 11: 1953 USGS Honolulu Quadrangle Map showing Project Area Location. ....</b>	<b>21</b>
<b>Figure 12: Previous archaeological studies conducted within and in the vicinity of the project area. ....</b>	<b>23</b>
<b>Figure 13: Historic properties identified in the vicinity of the project area.....</b>	<b>24</b>
<b>Figure 14: Google Earth (2020) image showing approximate location and direction of photographs taken during the field inspection.....</b>	<b>28</b>

## LIST OF TABLES

<b>Table 1: Previous archaeological studies conducted in the vicinity of the project area.....</b>	<b>25</b>
--	-----------



## **INTRODUCTION**

Scientific Consultant Services, Inc. (SCS) at the request of Belt Collins Hawaii LLC has prepared this Archaeological Literature Review and Field Inspection (LRFI) for the University of Hawai‘i at Mānoa Multi-Family Housing Project, Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu Island, TMKs: (1) 2-8-023:009. The project area, roughly trapezoidal in shape, is located on the eastern boundary of the University of Hawai‘i at Mānoa (UH-Mānoa) campus. The project area is bounded to the east by Mānoa Stream, to the north by an electrical power substation, to the west by the Burns Hall building, and to the south by Dole Street. The land was previously occupied by the National Marine Fisheries Service (NMFS) building complex, originally constructed in 1950 (Tomonari-Tuggle 1998). The approximately 2.21 acres project area is shown on a portion of the 1998 U.S. Geological Survey map (USGS), TMK map, and a 2018 Google aerial map (Figure 1 through Figure 3).

The UH-Mānoa Multi-Family Housing Project proposes the demolition of existing buildings within the project area in order to construct graduate student and staff family housing. The proposed new building towers will reach heights of 14 and 18-stories and contain approximately 388 individual units, consisting of approximately 203 studios and 185 two-bedroom units. The ground floor of the new building will also contain a convenience market, coffee shop, lounge, and childcare center.

This LRFI study was completed to facilitate the project’s planning and to support historic preservation review compliance by assessing the likelihood that archaeological historic properties may be affected by the project and, based on findings, providing cultural resource management recommendations. This LRFI is a Hawai‘i Revised Statutes (HRS) §6E planning document in support of Hawai‘i Administrative Rules (HAR) §13-275 only and is not intended to fulfill the requirements of an archaeological inventory survey (per HAR §13-276).

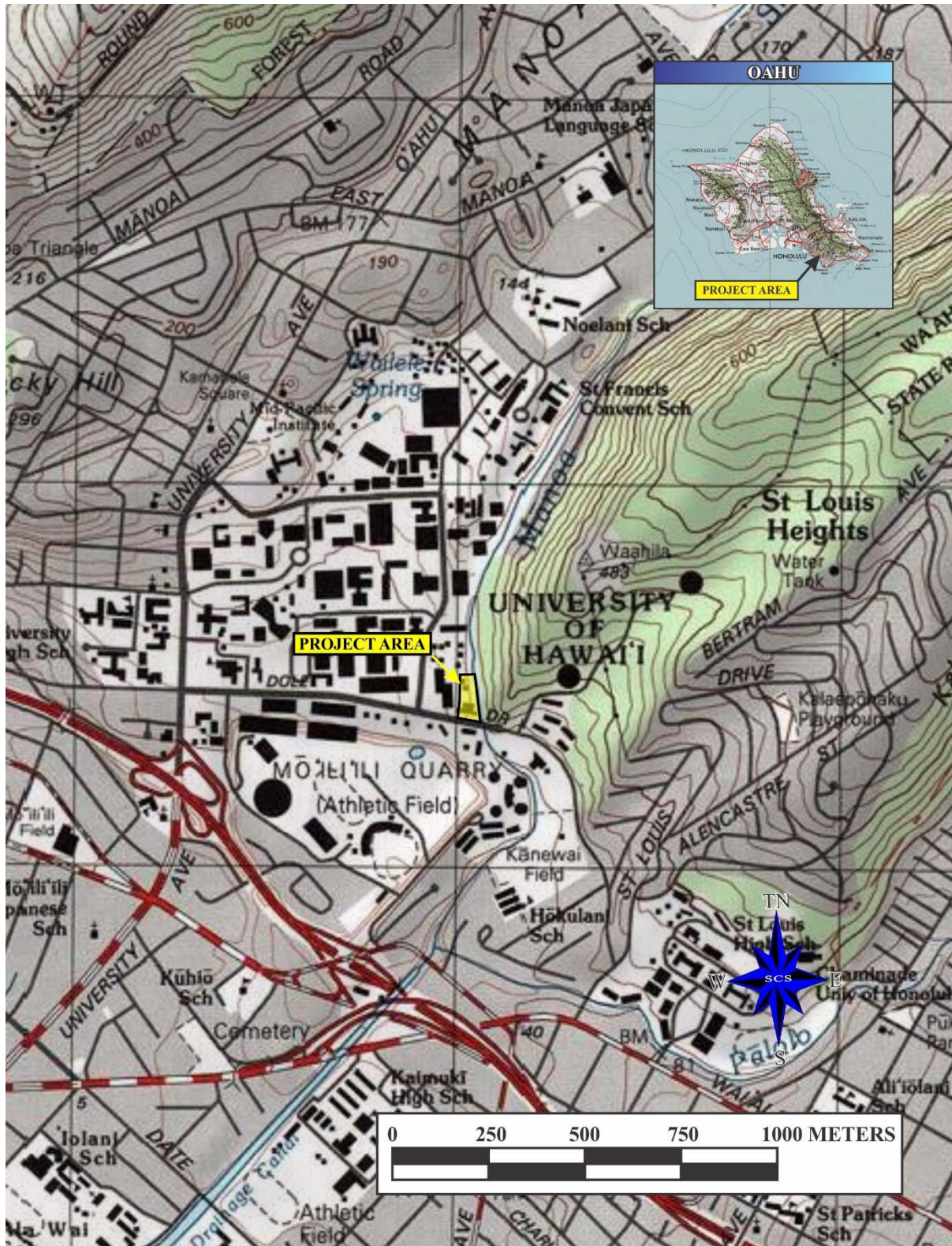


Figure 1: 1998 United States Geological Survey Honolulu quadrangle map showing the location of the project area parcel in yellow.







**Figure 3: 2013 Google Earth aerial photograph showing the location of the project area parcel in yellow.**



## **ENVIRONMENTAL SETTING**

### **PROJECT AREA LOCATION**

The 2.21-acre project area is situated at the southwestern base of Wa‘ahila Ridge (St. Louis Heights) on the eastern edge of Mānoa Valley. The project area is bounded by Mānoa Stream to the east, Dole Street to the south, the Burns Hall building to the west, and a Hawaiian Electric Company (HECO) substation to the north. The project area is located approximately 2.6 kilometers (km) north of O‘ahu’s southern coastline at an elevation of approximately 18.6 meters (m) (approximately 61 feet [ft]) above mean sea level (amsl).

### **CLIMATE**

The climate of Mānoa Valley is consistent with southeastern, leeward portion of O‘ahu, which is neither the driest and hottest nor the wettest and coolest portion of the island. The mean annual air temperature in the vicinity of the project area is 23.6 degrees Celsius (74.5 degrees Fahrenheit), ranging from a low average of 21.6 degrees Celsius (70.9 degrees Fahrenheit) in January to a high average of 25.4 degrees Celsius (77.7 degrees Fahrenheit) in August (Giambelluca et al. 2014).

The mean annual rainfall in the vicinity of the project area is about 870.6 mm (34 inches), ranging from an average low of about 36.5 mm (1.4 inches) in June to an average high of about 118.8 mm (4.7 inches) in December (Giambelluca et al. 2014).

### **SOILS**

Two distinct soil types are present within the project area. Most of the project area consists of Makiki stony clay loam (MIA), while the eastern edge bordered by the Mānoa Stream consists of rock land (rRK) (Foote et al. 1972:92, 119). These are depicted using data from the United States Department of Agriculture (USDA) in a Google Earth map in Figure 4, below.

#### **Makiki Series**

Makiki stony clay loam (MIA) is described as:

This soil is similar to Makiki clay loam, 0 to 2 percent slopes, except that there are enough stones to hinder cultivation. The stones are angular and make up about 15 percent of the soil by volume. The depth to basalt of cinders varies from 20 to 60 inches. Basalt outcrops are common. The soil is neutral to slightly acid. This soil is almost entirely in urban use. The University of Hawaii uses a small area for truck crop experiments. (Foote et al. 1972:92)



**Figure 4: Google Earth aerial photograph (2013) showing soil series in the project area and the vicinity.**

## **Rock Land Series**

Rock land (rRK) is described as:

This land type consists of areas that have 25 to 90 percent exposed rock. Among the rocks are soils that are only a few inches deep. Slopes are mainly 40 to 70 percent. Stones are common, and there is a danger of stones rolling to areas below (Foot et al. 1972:30).

## **VEGETATION**

The vegetation within the project area consists mostly of intermittent patches of landscaped grass, as much of the project area is a paved parking lot. Manicured hedgerows are also present and are located adjacent to the existing on-site structures. Several plumeria trees (*Plumeria rubra*) also exist on-site, both along Dole Street and in the north portion of the project area.

## **BUILT ENVIRONMENT**

Currently, there are three structures located within the project area confines. According to the City and County of Honolulu Department of Permitting and Planning website ([dppweb.honolulu.gov/DPPWeb/Default.aspx](http://dppweb.honolulu.gov/DPPWeb/Default.aspx)) the two northernmost single-story buildings (3332 and 6800 square feet) were constructed in 1945 and the southernmost two-story building (21,156 square feet) was constructed in 1955. The largest of the three structures is the two-story National Marine Fisheries Service laboratory building which borders the north side of Dole Street. The remaining two steel buildings identified as Annex I and Annex II are in the northern portion of the project area. Most of the remaining ground surface is comprised of a paved parking area with manicured areas and a covered walkway.

# **BACKGROUND RESEARCH**

## **TRADITIONAL HISTORY**

One of the most persistent and still unresolved questions in Hawaiian archaeology is: when did Polynesians first colonize the archipelago? In the early twentieth century, oral traditions and genealogies were thought to hold the best potential to establish chronologies. These sources suggested that at least two migrations occurred, with the second migrant group seizing power from the first (Bayman and Dye 2013:20). However, more than a century of archaeological research has contributed significantly to the historical evidence base.

When it was first introduced in the mid-twentieth century, radiocarbon dating was heralded as a means to sharpen the historical resolution of genealogies, but this promise has proven elusive, resulting in a wide range of estimates. Early on, three sites were identified as potentially containing evidence of initial settlement: H1, O18, and the Hālawā Valley Dune site, based on comparative analysis of historically documented Hawaiian culture and a presumption of evolution in cultural

form (Bayman and Dye 2013:21). In the 1990s, initial Hawaiian colonization was estimated at AD 0-400 (Bayman and Dye 2013:22-23). However, recent reinterpretations of the chronometric age estimates challenge these early dates.

Chronometric hygiene, which has attempted to refine errors in estimates and only accepts 'clean' dates, suggested A.D. 1219-1266 as the earliest documented evidence of settlement. However, this date range is probably too late, as non-archaeological paleo-environmental records suggest that human environmental perturbations began around A.D. 700-800. Flora and fauna introduced by Polynesians can also be dated. For example, the earliest dated Polynesian rat (*Rattus exulans*) bones suggest a settlement date of about A.D. 960-980. The accumulation of more data points will likely increase the precision of the settlement model (Bayman and Dye 2013:23).

### **PAST POLITICAL BOUNDARIES**

In general, several Hawaiian terms, such as *moku*, *ahupua'a*, *'ili* or *'ili 'āina* were traditionally used to delineate various land sections. A district (*moku*) contained smaller land divisions (*ahupua'a*) that customarily continued inland from the ocean and upland into the mountains. Extended household groups living within the *ahupua'a* were therefore able to harvest from both the land and the sea. Ideally, this situation allowed each *ahupua'a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *'ili* were smaller land divisions next in importance to the *ahupua'a* and were administered by the chief who controlled the *ahupua'a* in which it was located (Lyons 1875:33; Lucas 1995:40). The *mo'o 'āina* were narrow strips of land within an *'ili*. The land holding of a tenant, or *hoa 'āina*, residing in an *ahupua'a* was called a *kuleana* (Lucas 1995:61). The project area is located in the traditional *moku* of Kona, which was renamed Honolulu in 1859, and Mānoa Ahupua'a (USGS 1998).

One legend, related by Handy and Pukui (1951:187), discussed the control of O'ahu territory by gods during an early era. According to this legend the project area would have been considered part of a leeward *moku*. At a later period, possibly during the early sixteenth century, other oral traditions indicate that Mā'ilikukahi was chosen by the chiefs to be the *mō'īho 'oponopono o ke aupuni* (administrator of the government) and to perform the division of O'ahu's land into districts (*moku*) and subdistricts (Cordy 2002; Kamakau 1991:53-55). Mā'ilikukahi created six districts and six district chiefs (*ali'i 'ai moku*). Land was considered the property of the king or *ali'i 'ai moku* (the paramount chief of the district or island). The title of *ali'i 'ai moku* ensured rights and responsibilities to the land but did not confer absolute ownership. The king kept the parcels he wanted; his higher chiefs received large parcels from him and, in turn, distributed smaller parcels to lesser chiefs. The *maka'āinana* (commoners) worked the individual plots of land. It is said that Mā'ilikukahi gave land to *maka'āinana* all over the island of O'ahu (Cordy 2002).



In accordance with the oral traditions quoted above, ethno-historic evidence, and archaeological data, Ladefoged and Graves (2006) suggested that originally O‘ahu was divided into two *moku*, each ruled by an independent chief: a leeward *moku*, possibly referred to as Kona, and windward *moku*, possibly called Ko‘olau (Ladefoged and Graves 2006:264). As stated above, the project area would have been situated within the hypothetical ancient leeward *moku*. According to Ladefoged and Graves, these hypothetical windward and leeward *moku* were later subdivided into multiple *moku*. Because oral traditions suggest that during the later pre-contact era (i.e., post-colonization) paramount chiefs ruled over a mix of wet and dry *moku*, Ladefoged and Graves further suggested that the original leeward/windward land division eventually gave way to a north/south division—a hypothesis which they note is supported by the archaeologically determined *heiau* (temple) construction sequences (Ladefoged and Graves 2006:266). The project area would have been situated within the southern political division.

In the Hawaiian Islands, *moku* are subdivided into multiple *ahupua‘a*. Presumably these smaller divisions occurred because of socio-political and geographic fissioning resulting in the creation of new landholding descent groups, each of which was associated with discrete *ahupua‘a* (Kirch 1985:31-33). While the absolute chronology of *ahupua‘a* creation and delineation is unknown, Ladefoged and Graves (2006) have developed a method for predicting the sequence of *ahupua‘a* divisions. Ladefoged and Graves suggested that *ahupua‘a* originally followed natural features, and that, therefore, *ahupua‘a* that have bifurcation points at or near ridgelines, referred to as full bifurcations, predate *ahupua‘a* whose bifurcation points occur part way down an adjacent *ahupua‘a* boundary, called partial bifurcations (Ladefoged and Graves 2006:271).

## **TRADITIONAL SETTLEMENT PATTERNS**

Archaeological settlement pattern data suggests that initial colonization and occupation of the Hawaiian Islands first occurred on the windward shoreline areas of the main islands. The drier, leeward part of O‘ahu was apparently used intermittently for natural resource exploitation, as evidenced, for example, by coastal fishing sites (Cordy 2002:14-15). However, permanent settlement in leeward portions of the islands did not occur for at least several centuries (Kirch 2011). Specifically, for southeastern O‘ahu, in the vicinity of the project area, Thomas suggested that “early settlements may have been in rockshelters, with subsequent permanent housing in the coastal areas” (1995:24). Because the project area is neither situated within a coastal zone, nor likely to have contained caves in the past, the earliest settlement in the vicinity of the project area may date to the late expansion period, or later.

Although coastal settlement was initially dominant, Native Hawaiians eventually began cultivating and living in the upland *kula* (plains) zones. They tended to settle in ecotones that offered both fishing and agricultural opportunities, suggesting that access to inland resources was

a priority (Kirch 1985). Although Hawaiians traditionally received the majority of their protein from fish, Handy has stated: "...for every fisherman's house along the coasts there were hundreds of homesteads of planters in the valley and on the slopes and plains between the shore and forest" (1972:vi). The Hawaiian economy was based on agricultural production and marine exploitation, as well as raising livestock and collecting wild plants and birds. Extended household groups settled in various *ahupua'a*. During pre-Contact times, there were primarily two types of agriculture, wetland and dry land, both of which were dependent upon geography and physiography. River valleys provided ideal conditions for wetland kalo (taro, *C. esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugarcane, *Saccharum officinarum*) and *mai'a* (banana, *Musa* sp.), were also grown. In leeward sections of the Hawaiian Islands, other crops, such as *'uala* (sweet potato, *Ipomoea batatas*) were produced. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch 1992:5, 119; Kirch 1985).

Agricultural development on the leeward side of O'ahu was likely to have begun during the Late Expansion Period (AD 1400–1650), possible only after, and as a consequence of, the arrival of sweet potato in the Hawaiian archipelago (Kirch 2010:128, Table 4.1, 2013:100). Greater population expansion to inland areas began around the fourteenth century and continued through the sixteenth century. Large scale or intensive agriculture was implemented in association with habitation, religious, and ceremonial activities (Kirch 2010). Several prominent archaeologists have persuasively argued that expansion from productive, windward coastal parts of the Hawaiian Archipelago areas into more marginal areas was a key aspect of the transition from chiefdom to state-level political organization. However, recent research by Kahn et al. (2016) suggests that hinterland areas were exploited early because they provided access to unique resources, and later possibly to escape the tyranny of the emerging states.

Traditionally, Hawaiian chiefs preferred coastal lands for their residences. Easily accessible resources such as offshore and onshore fishponds, the sea with its fishing and surfing—known as the sports of kings, and some of the most extensive and fertile wet taro lands were located in the area (Kirch 1992:19). In the early post-Contact period, Mānoa Valley was a favored spot of the *ali'i*, including Kamehameha I, Chief Boki (Governor of O'ahu), Ka'ahumanu, Ha'alilio (an advisor to King Kamehameha III), Princess Victoria, Kana'ina (father of King Lunalilo), Lunalilo, Ke'elikōlani (half-sister of Kamehameha IV), and later Queen Lili'uokalani (Thrum 1892:114). Inland resources necessary for subsistence could easily be brought to the *ali'i* (chiefs) residences on the coast from nearby inland plantations. The majority of farming was situated in the lower portions of stream valleys where there were broader alluvial flat lands or on bends in the streams where alluvial terraces could be modified to take advantage of the stream flow. Dry land cultivation occurred in colluvial areas at the base of gulch walls or on flat slopes (Kirch 1985; Kirch 1992:59).

## LATE POST-CONTACT PERIOD

Historical accounts of the Mānoa Valley and the adjacent Palolo Valley, situated at the base of Ko‘olau Range, highlight the quantity and quality of agricultural fields within the region. The area between the head of Mānoa Valley and the ocean used to be one continuous spread of taro land and fishponds (Handy and Handy 1972; Menzies 1920; Vancouver 1798: I). According to Handy and Handy (1972:290) “[i]n localities like Waipi‘o on Hawai‘i or Mānoa on O‘ahu, where there was extensive and continuous taro cultivation of contiguous lo‘i, houses were not far apart, land holdings were interlocking, and the systems of waterways were controlled and serviced collectively.”

Bloxam described several hundred fishponds extending a mile inland from the shore (Bloxam 1925). However, as the post-Contact period of Hawaiian history progressed, the use of land for agriculture and fishponds greatly decreased. By 1901, only 14 fishponds were recorded to be in use in the valley (Cobb 1905). In agreement with this pattern, a quarter-century later McAllister observed that “all of this land has been drained and filled: neither fishponds nor taro lands have survived” (McAllister 1933:76).

In 1811 Liliha, the daughter of Hoapili, inherited the lands and brought them with her to her marriage to Boki, Governor of O‘ahu (Bouslog et al. 1994). Whilst on a trip to England Boki met British agriculturalist John Wilkerson, who subsequently traveled back to Hawai‘i with Boki. In 1825, Wilkerson planted seven acres atop Punahou Hill with sugar cane, which was the first sugar plantation in the Hawaiian Islands (Kamakau 1991). After Wilkinson’s death in 1826, the plantation was converted into a distillery before becoming a base for mission work (Kuykendall 1938:172).

Historical documents suggest that in the nineteenth century, Mānoa Valley included agricultural fields and scattered settlements (Figure 5). In 1892, before it was urbanized, Thrum described the beauty of Mānoa Valley and his description made clear that land use in historic times saw a variety of uses, with taro cultivation being the most prominent. Some coffee was planted in Mānoa Valley foothills in conjunction with Wilkinson's agricultural endeavors as well (Thrum 1892:114):

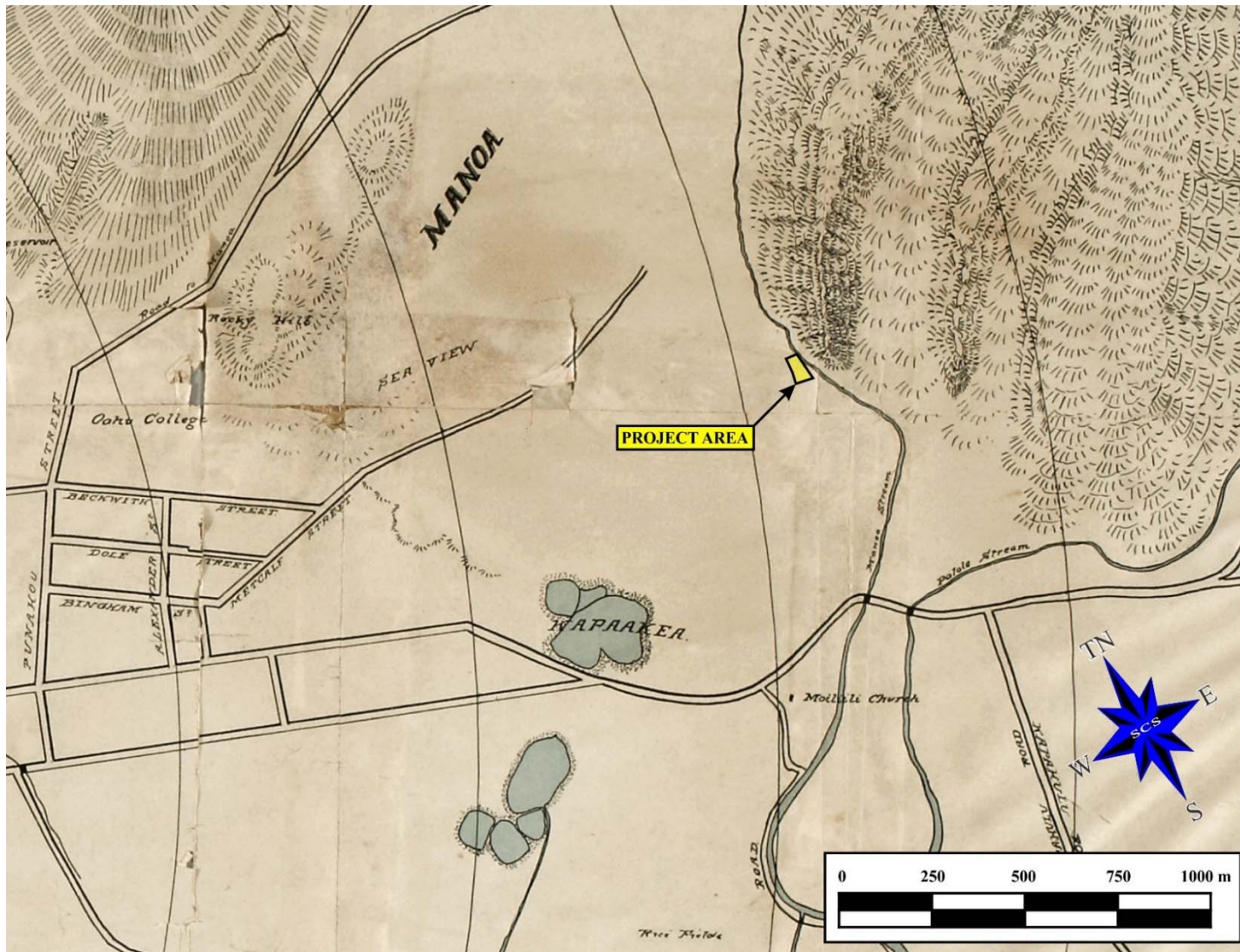


Figure 5: Project area location on the Dove 1892 map of Honolulu. The approximate location of the project area parcel is shown in yellow.



“For nearly a mile the road leads by or along pasture fields with no vestige of tree or shrub other than the lantana pest and an occasional algeroba (*kiawe*), and passes along Round top or Ualakaa ...

At this summit of the road the whole valley opens out to view, the extensive flat area set out in taro, looking like a huge checker-board, with its symmetrical emerald squares in the middle ground, surrounded by pasture fields on the slopes at the base of the guarding hills. Here and there 'mid sheltering trees, humble dwellings dot the scene around, while up the rugged slopes the almost endless shades of green with black worn seams of rock oft times lightened by 'silvery thread of torrent', forms the background to one of the most charming pictures, either in the clear sunlight, heightened as it often is by cloud shadows chasing rifts of sunshine down the mountain sides; or, as frequently, may be, to watch the drifting mist or rain sweep down one side of the valley, while the other basked in the sun, throwing over its weeping neighbor a 'bow of promise' so radiant and bright that its-double, or even triple, reflection is no rarity” (Thrum 1892:110-111).

Historical maps of this same period indicate the absence of urban development in the vicinity of the project area (see Figure 5). Hence, on the eve of the twentieth century, the landscape of the Mānoa Valley in the vicinity of the project area would have resembled the pre-contact landscape. Within a few decades, this would no longer be the case.

### **The Māhele**

In the 1840s, traditional land tenure shifted drastically with the introduction of private land ownership based on Western law. Kamehameha III established laws changing traditional Hawaiian economy to that of a market economy (Kuykendall 1938, Daws 1984, Kelly 1983). The Board of Commissioners to Quiet Land Titles, also known as the Land Commission, was established in 1845 for “the investigation and final ascertainment or rejection of all claims of private individuals, whether natives or foreigners, to any land property” (Chinen 1961:8). The Māhele of 1848 divided Hawaiian lands between the king, chiefs, government, and began the process of private ownership of lands. The subsequently awarded parcels were called Land Commission Awards (LCAs). Once lands were thus made available and private ownership was instituted, the *maka'āinana* (commoners) were able to claim the plots on which they had been cultivating and living, if they had made aware of the procedures.

These claims did not include any previously but currently fallow cultivated lands, *'okipu'u* (forest clearing on O'ahu, stream fisheries, or many other resources necessary for traditional survival (Kelly 1983, Kirch and Sahlins 1992). If occupation could be established through the testimony of two witnesses, the petitioners were awarded the claimed LCA and issued a Royal Patent after which they could take possession of the property (Chinen 1961).

Data culled from the Māhele records largely confirms the land use practices in the previously mentioned narratives. The 68 LCAs located within the Mānoa Valley were primarily were for *lo'i*, house lots, *'āpana* and various agricultural purposes. The largest grant went to the American Board of Commissioners for Foreign Missions who received a total of 30 0.68 ha (1.68 ac.); this became the campus for Punahou School (Bath and Kawachi 1990). The project area was formerly owned by Victoria Kamamalu, who died in 1866. The land was then passed to her sole heir Moses Kekuanaoa. In 1868, Kekuanaoa died and the land was passed to Kamehameha V. In 1872, Kamehameha V died, and the land was passed to Princess Ruth. In 1883, Princess Ruth died, and the land was passed to Bernice Pauahi Bishop. When Bishop died, the land became part of the Bishop Estate (Ebisu 1983:169).

Although multiple Land Commission Awards (LCA) are located to the south and north of the project area, only LCA 1748 includes the project area (Figure 6). Land Commission Award 1748 consists of a 7.44-acre parcel of land in Kānewai and is bisected east-west by Dole Street. The north portion of LCA 1748 contains the current project area. Originally awarded to Ono in 1847, LCA 1748 was described solely as a house lot, containing three of Ono's houses and bounded by a fence (Waihona 2019). Documentation for LCA 1748 is provided as Appendix A.

### **LATE 19<sup>TH</sup> TO 20<sup>TH</sup> CENTURY**

For a two-year period of time beginning in 1882 some Chinese companies attempted to shift their taro agriculture to rice cultivation. High winds, cold rains and rice birds confounded those early attempts at diversification, and the fields were once again used to grow taro (Thrum 1892:116). Mānoa Valley was also utilized as pasture land in historic times for the "stock of more than one dairy enterprise" (Thrum 1892:110).

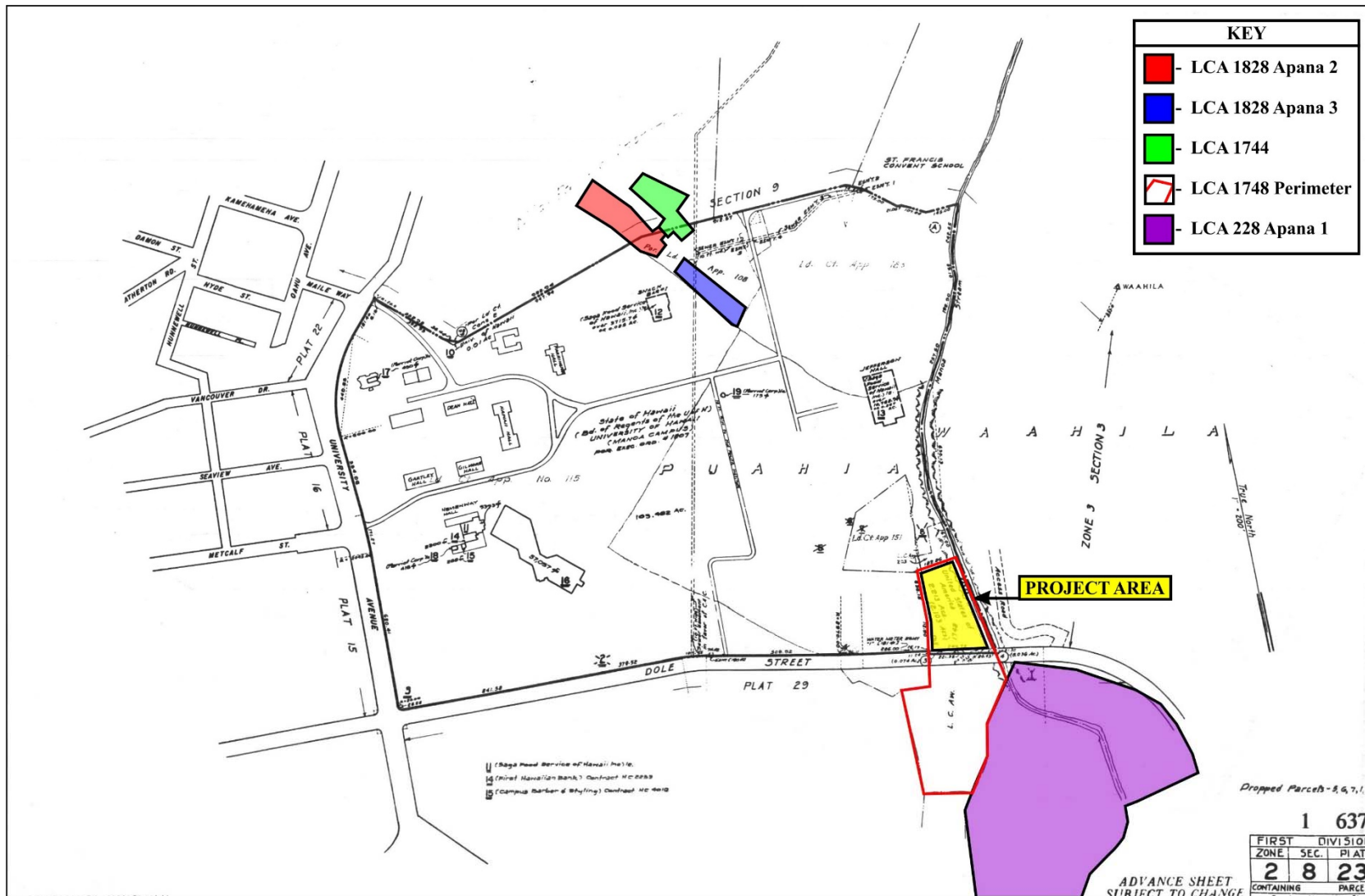


Figure 6: Land Commission Awards in and surrounding the project area.

As early as 1889, the areas within and immediately *makai* of the project area was used as a stone quarry, known as Mo‘ili‘ili Quarry. The location of this quarry is documented in a historical map (e.g., starting with the 1899 map of Oah‘u, Figure 7). In 1908, the Honolulu Construction and Draying Co. was incorporated and, after obtaining a lease from the Bishop Estate, began operations at the Mo‘ili‘ili Quarry the following year. The stone quarried from this location, which was known as the best in the Hawaiian archipelago, was used to build many structures within the growing city of Honolulu, ranging from curbstones to tombstones. The quarry became especially important during World War II, to support the military’s efforts to harden defenses. Mining operations ceased at the Mo‘ili‘ili Quarry in 1949 (Ebisu 1983:169-170). Even before the quarry ceased operation, the University of Hawai‘i sought to acquire the property, and this acquisition was approved in 1947. Construction in this parcel began in 1956 with the Physical Education Building (Ebisu 1983:171).

Through the early decades of the twentieth century, the area in the vicinity of the current project area remained relatively undeveloped as seen in historic maps from the time (Figures 8, 9, and 10). The expansion of the University of Hawai‘i and other land use changes in the Mānoa Valley were related to the changing demographics and economies of the Hawaiian Islands (Figure 11). By the mid-twentieth century, taro fields gave way to residential land use, as Handy observed: "Some of the lower portions of the old taro area inland from the slightly elevated land southwest of Rocky Hill is now covered by streets and houses" (Handy 1940:77; see Figure 10). After World War II, the Hawaiian sugar industry market declined as mainland-produced corn syrup gained increased market share. At the same time, the tourist industry began to dramatically expand as American GIs who had spent time in the Pacific theatre returned with their families to Hawai‘i, which was advertised as an idyllic paradise (Kraus-Friedberg 2008:127). The population of O‘ahu also began to increase significantly in the post-war years, especially in Honolulu and surrounding areas, leading to the conversion of former agricultural lands to residential and commercial developments (Fung Associates, Inc. 2011). The agricultural to urban transformation accelerated following Statehood (Fung Associates, Inc.) and this is well documented for Mānoa Valley as seen in changes between 1927 (see Figure 10) and 1953 (see Figure 11).





Figure 7: Project area location on the 1899 map of Oahu (Taylor 1899). The quarry is identified to the southwest of the approximate location of the project area parcel (which is indicated in yellow).



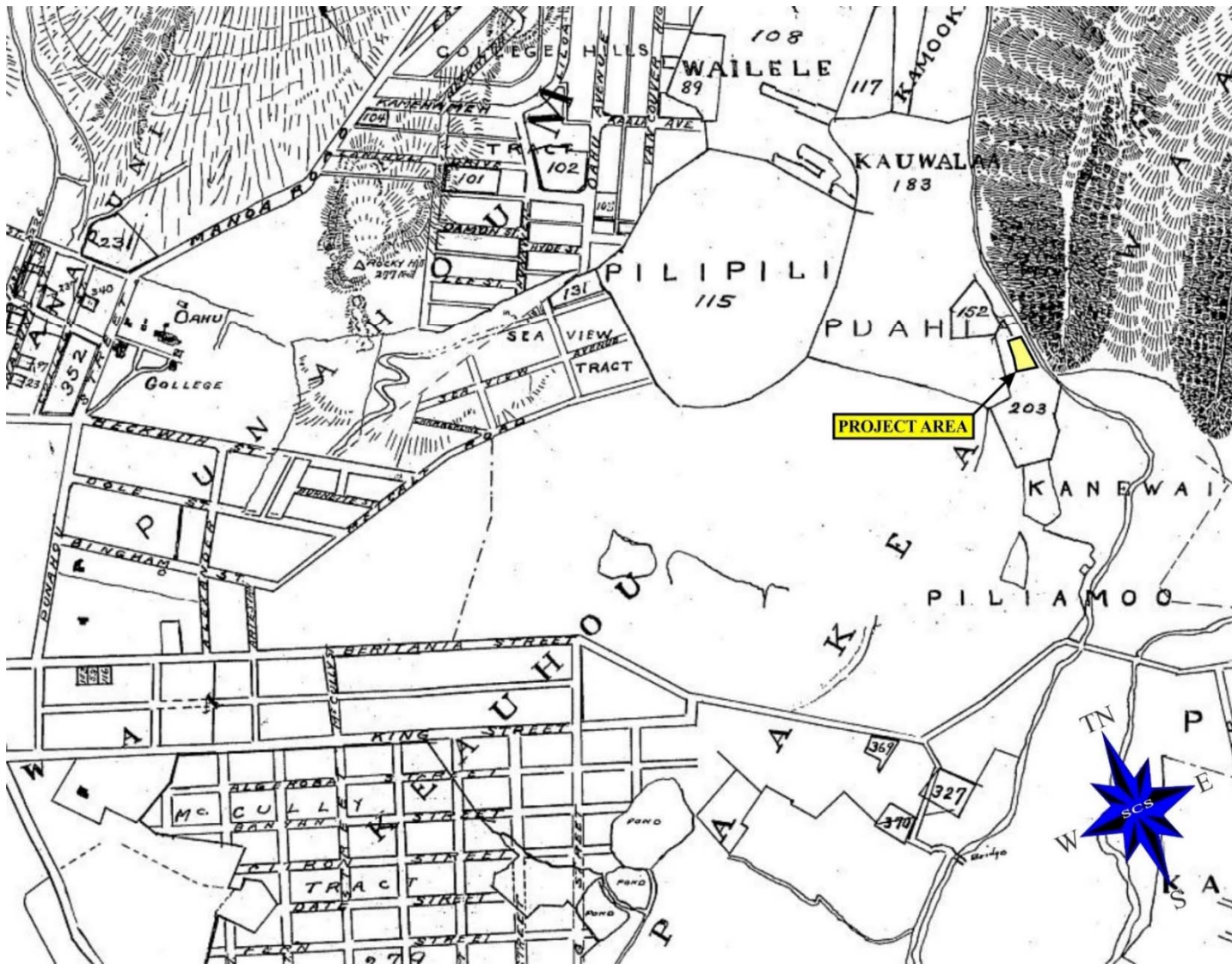


Figure 8: Project area location on the Monsarrat 1901 map of Honolulu. Note the lack of development in the vicinity of the project area (approximate location marked in yellow).

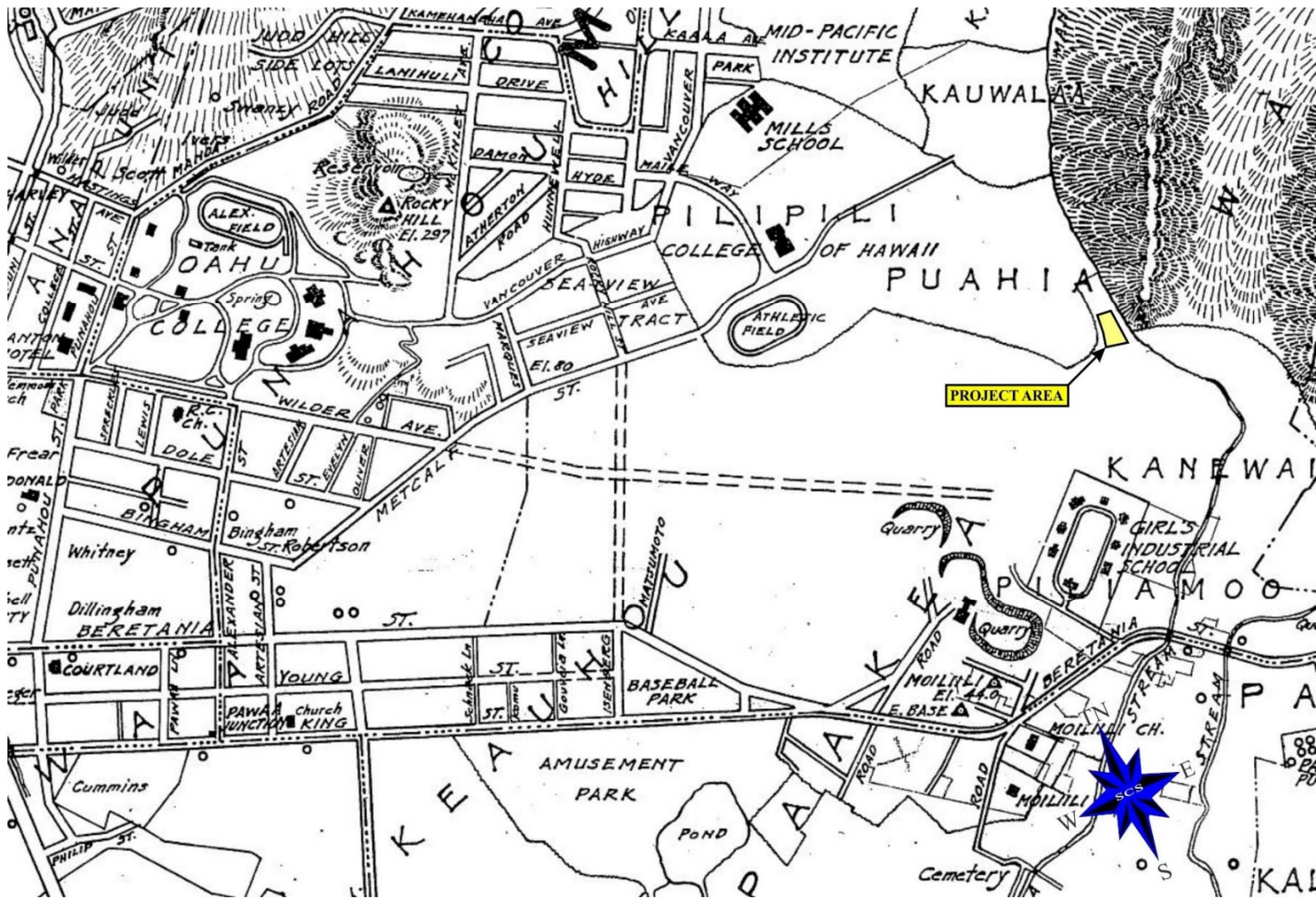


Figure 9: Project area location on the 1920 Monsarrat map of Honolulu. Note the quarry is still noted on this map to the southwest of the approximate location of the project area, identified in yellow.



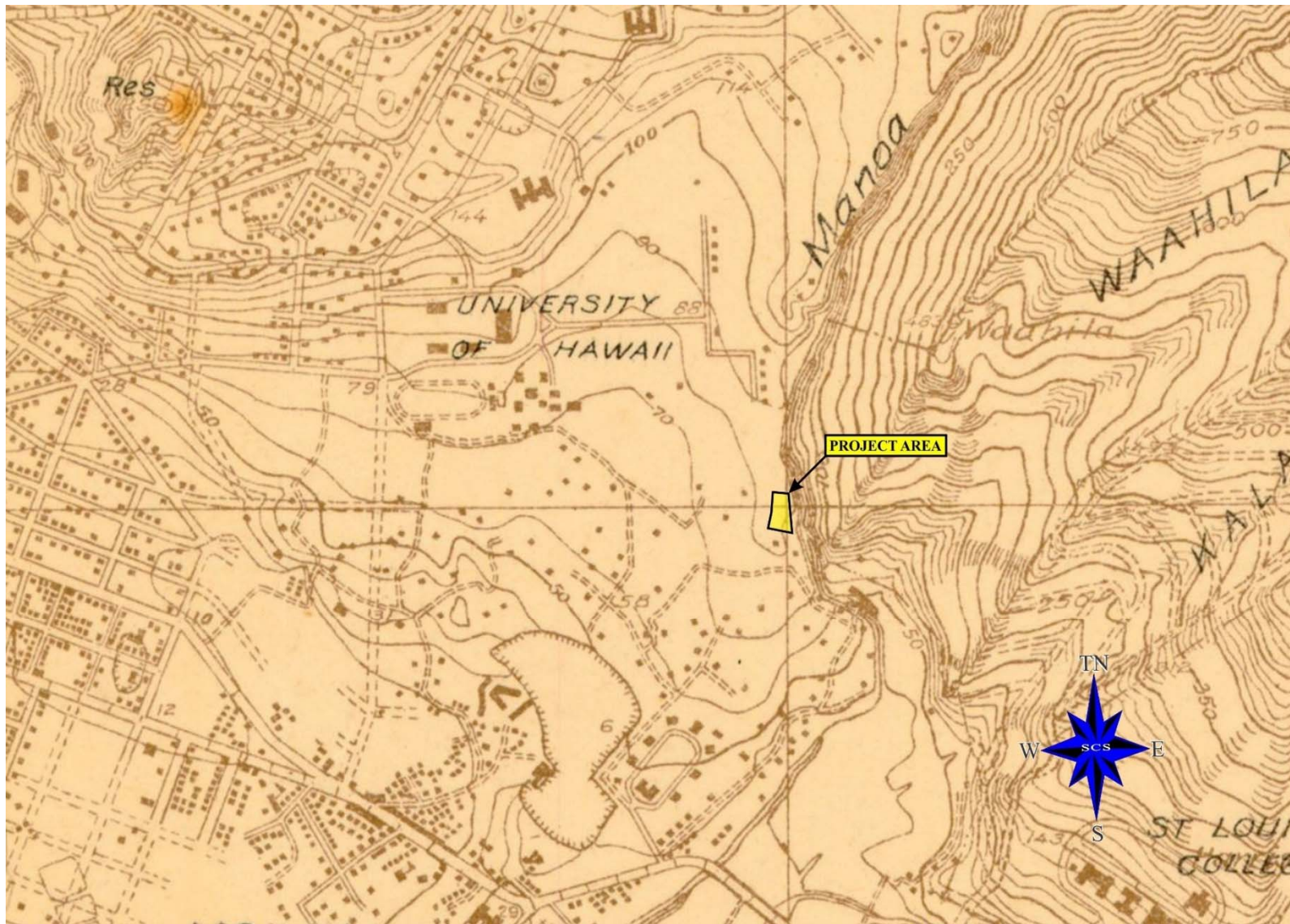


Figure 10: 1927 USGS Honolulu Quadrangle Map showing Project Area Location.



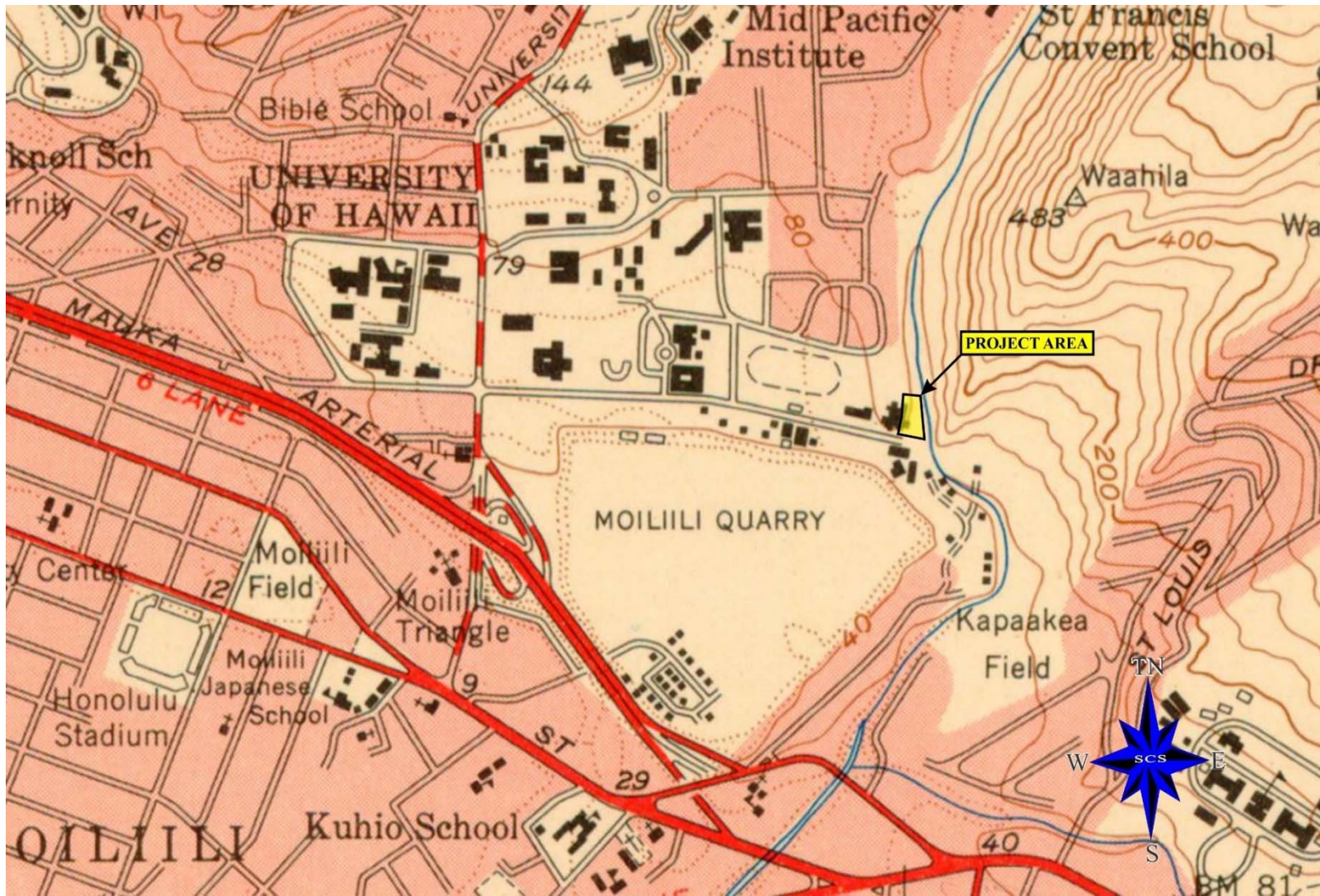


Figure 11: 1953 USGS Honolulu Quadrangle Map showing Project Area Location.

## **PREVIOUS ARCHAEOLOGY**

Despite numerous historical descriptions that suggest the Mānoa Valley would have been home to a large population during the pre-Contact Period, relatively few archaeological studies have been conducted in the area that would help to expand on the prehistory of the valley. Numerous archaeological projects have documented the presence of human skeletal remains on and near the UH-Mānoa campus (Smith & Kawachi 1989, Hammatt & Shideler 1991), while additional projects have focused on historical research and excavation of taro fields located at Kānewai situated at the mouth of the valley (Liston & Burtchard 1996). Previous archaeological studies conducted within or near the project area are listed in below (Figure 12). Historic properties identified in the vicinity of the project area are listed below (Figure 13). The studies most relevant to the current project areas are further described below in Table 1.

Bath et al. (1988) report the discovery of human remains at the intersection of Wilder and Metcalf Avenues. The burial, designated SIHP # 50-80-14-4038, was determined to have been disturbed during construction and was encountered at approximately 120-130 centimeters below ground surface. Additional cultural materials including charcoal and invertebrate remains were also found in association with the skeletal material.

Smith and Kawachi (1989) recovered a burial that was inadvertently discovered during construction at Keller Hall. The burial was identified during excavation of an air conditioner runoff drain and designated as SIHP # 50-80-14-4191. Further analysis of the remains determined they represented a single adult male (Douglas 1990).

The most significant archaeological site in the vicinity of the current project area was identified by Hammatt and Shideler (1991). During trenching for the installation of waterlines along Dole Street near Kānewai Park, the remains of at least 18 individuals were recovered along with midden deposits and several artifacts. The site was designated as SIHP # 50-80-14-4266. Radiocarbon dates taken from two samples indicate the site likely dates to the 15<sup>th</sup> century AD. The authors noted: “It seems probably that the locus of these burials contains more interments and it is recommended that any agencies involved in future subsurface work in the immediate vicinity consult with the appropriate agencies in advance” (Hammatt and Shideler 1991: i).



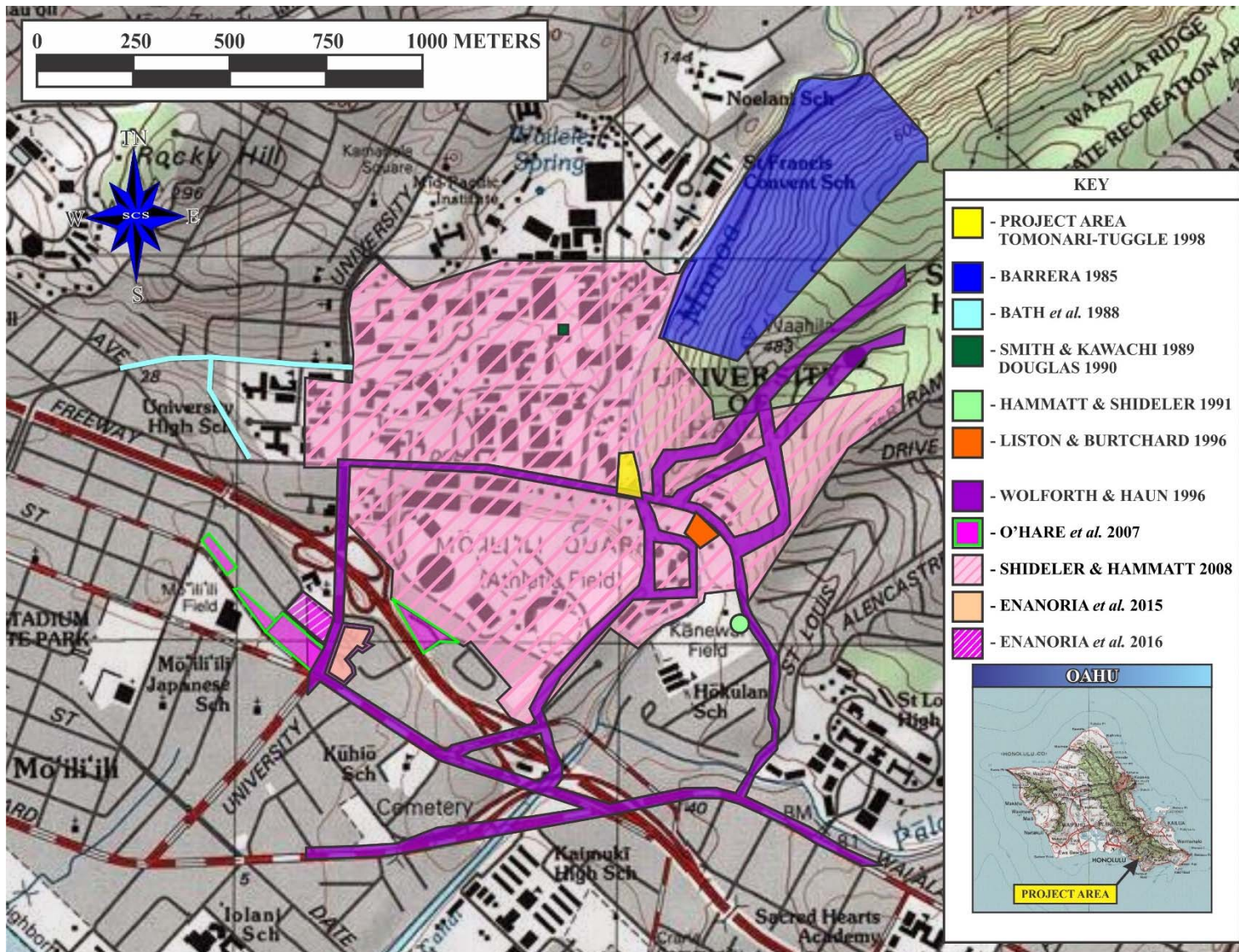


Figure 12: Previous archaeological studies conducted within and in the vicinity of the project area.



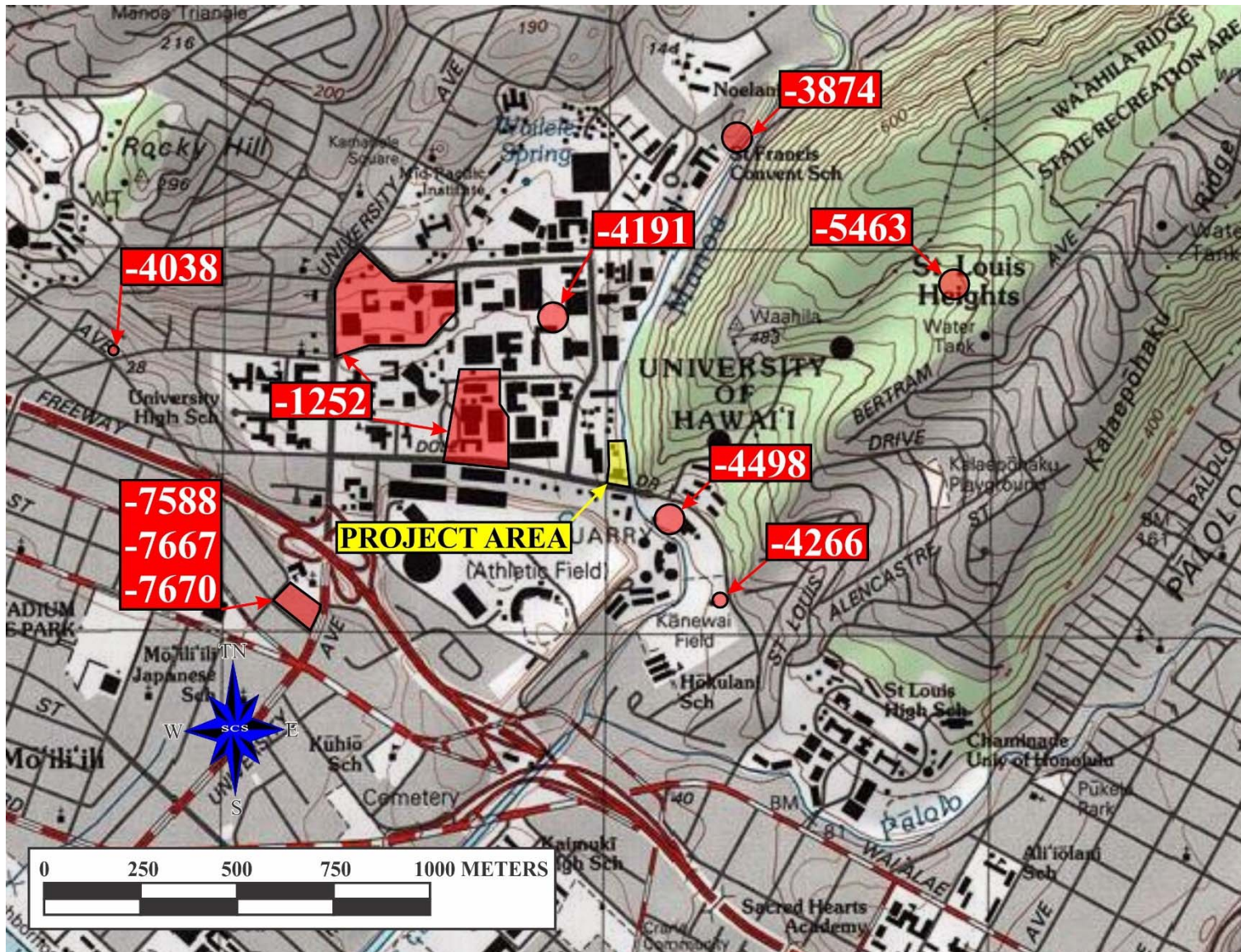


Figure 13: Historic properties identified in the vicinity of the project area.



**Table 1: Previous archaeological studies conducted in the vicinity of the project area.**

Reference	Location	Description and Results (SIHP # 50-80-14-XXXX)
Ching 1968	Former Magoon property given to UH Mānoa	A possible unnamed heiau consisting of two rock structures were observed. One rock structure was a linear rock mound and the other rock structure was a platform. Site was designated as SIHP # -3874.
Barrera 1985	Mānoa Hillside	Documented an old road, no SIHP number assigned
Bath et al. 1988	2030 Wilder Avenue	Partially disturbed burial removed, designated as SIHP # -4038
Kawachi 1988	Saint Francis High School campus	Identified multiple walls and terraces in a heavily vegetated area. No SIHP # assigned.
Smith & Kawachi 1989	UH Mānoa near Keller Hall	Identified human remains, designated as SIHP # -4191
Douglas 1990	UH Mānoa near Keller Hall	Identified human remains from previously identified SIHP # -4191, determined to represent a single adult male
Hammatt & Shideler 1991	Kānewai	18 human skeletal remains found on Dole Street, designated as SIHP # -4266
Liston & Burtchard 1996	Hawaiian Studies Institute	Paleoenvironmental sampling and stratigraphic profiling at Mānoa Stream identified a prehistoric irrigation system carbon dated to AD 1443-1681 at Kapapa <i>lo'i</i> , Kānewai, designated as SIHP # -4498
Wolforth & Haun 1996	Mānoa	Identified numerous historic buildings within the UH Mānoa campus, including the Kānewai Cultural Garden (SIHP # -1252) and agricultural terraces and walls along Wa'ahila Ridge (SIHP # -5463)
Tomonari-Tuggle 1998	National Marine Fisheries Service Laboratory (current project area)	Archaeological Assessment, recommended subsurface testing or archaeological monitoring for future ground-disturbing activities within the project area
O'Hare et al. 2007	Kamehameha Schools University parcels and Varsity Theatre	A literature review and field inspection identified previous agricultural use of the area
Shideler & Hammatt 2008	UH Mānoa Campus	A literature review and field inspection identified previously recorded sites within the campus [SIHP #s -1252 (architectural sites), -4191 (burial), -4498 (agricultural features), the Koana Cave, and the site of Hipawai Heiau].
Enanoria et al. 2016	Varsity Parcels	Identified wetland soil deposits (SIHP #s -7588 and -7667) and early to mid-twentieth century structural remnants (SIHP # -7670)

Also significant were data recovery excavations undertaken at the nearby Kānewai Cultural Garden and adjacent to the Center for Hawaiian Studies facilities (Liston and Burtchard 1996). A series of trenches revealed the presence of prehistoric irrigation features (SIHP -4498), as well as taro pollen identified within paleoenvironmental samples. Radiocarbon dating suggests that irrigation and use of this area began between AD 1443-1681. Stratigraphic profiles obtained were interpreted by the authors as showing that this area was used for agricultural purposes off and on well into the Historic Period.

In 1998, an archaeological assessment of the current project area was undertaken in advance of proposed renovations to the National Marine Fisheries Service building (Tomonari-Tuggle 1998). Although no excavations were carried out, the author concluded that the area could potentially contain subsurface archaeological features based on archival data and the findings of nearby archaeological studies. Additionally, geotechnical borings undertaken within the project area as part of an environmental assessment revealed material that could potentially be of a cultural origin, but the results were inconclusive.

In 2008, Cultural Surveys Hawaii conducted an archaeological literature review and a field inspection at various locations on the UH-Mānoa campus. This study identified recapitulated what was known about several sites, including SIHP-1252 (architectural sites), -4191 (burial), -4498 (agricultural features), the Koana Cave (no SIHP number assigned), and the site of Hipawai Heiau (McAllister Site 63; no SIHP number assigned) (Shideler and Hammatt 2008). The Koana Cave and Hipawai Heiau are located more than 0.8 km (0.5 mi.) from the project area. None of the noted sites were located within the current project area.

## **ARCHAEOLOGICAL FIELD METHODS**

The archaeological field inspection was conducted for the UH-Mānoa Multi-Family Housing Project in April 2020 by SCS archaeologist Michael Woodburn, M.A. The field inspection was conducted under the supervision of Morgan E. Davis, M.A. (SCS principal investigator).

Field methods consisted of a pedestrian survey of the entire project area accompanied by digital photographs taken at multiple locations within and surrounding the project area. Archival research was also conducted at State Historic Preservation Division library in Kapolei to identify historic properties and previous archaeological research in the vicinity of the project area. All notes and digital photographs for this project are currently being curated at the SCS laboratory on O‘ahu.

## **RESULTS OF ARCHAEOLOGICAL FIELD INSPECTION**

Fieldwork consisted of a 100% pedestrian survey of the project area for the purpose of identifying potential historic properties. Fieldwork was conducted in April 2020 by SCS archaeologist Michael Woodburn, M.A. under the supervision of Morgan E. Davis, M.A. (SCS principal investigator). Digital photographs were taken of various locations both within and surrounding the project area to provide complete documentation. The approximate locations and directions of all digital photographs taken are illustrated in Figure 14 with all digital photographs taken during the field inspection included as Appendix B.

The main feature of the project area is the two-story tall National Marine Fisheries Service (NMFS) building which was constructed in 1955 and fronts Dole Street. On both flanks of the two-story tall building's main entrance stairway are two basalt rock walls with cement adhesive. The front grounds of the building consist of landscaped grass, manicured hedgerows, a single plumeria tree, and at least one palm tree species. Located east of the two-story building on Dole Street is a small bridge, constructed in 1953, from which the Mānoa Stream can be observed. The Mānoa Stream functions as the eastern boundary of the project area.

Located west of the National Marine Fisheries Service building is a paved asphalt driveway that extends from Dole Street and heads toward the rear portion of the project area. This paved asphalt driveway is the project area's western boundary. A visually estimated 20 to 30 percent of the project area consists of a paved asphalt parking lot interspersed with small patches of grass, maintained or otherwise. The northern edge of the project area contains two annex buildings, both constructed in 1945, that are largely constructed of corrugated metal roofing and siding. Both annex buildings are bounded to the north by a Hawaiian Electric Company substation located on TMK: (1) 2-8-023:003. Located on the eastern edge of the project area is a near vertical embankment that drops down to the Mānoa Stream. Also present within the project area is a covered walkway leading from the two north annexes to the main NMFS building.

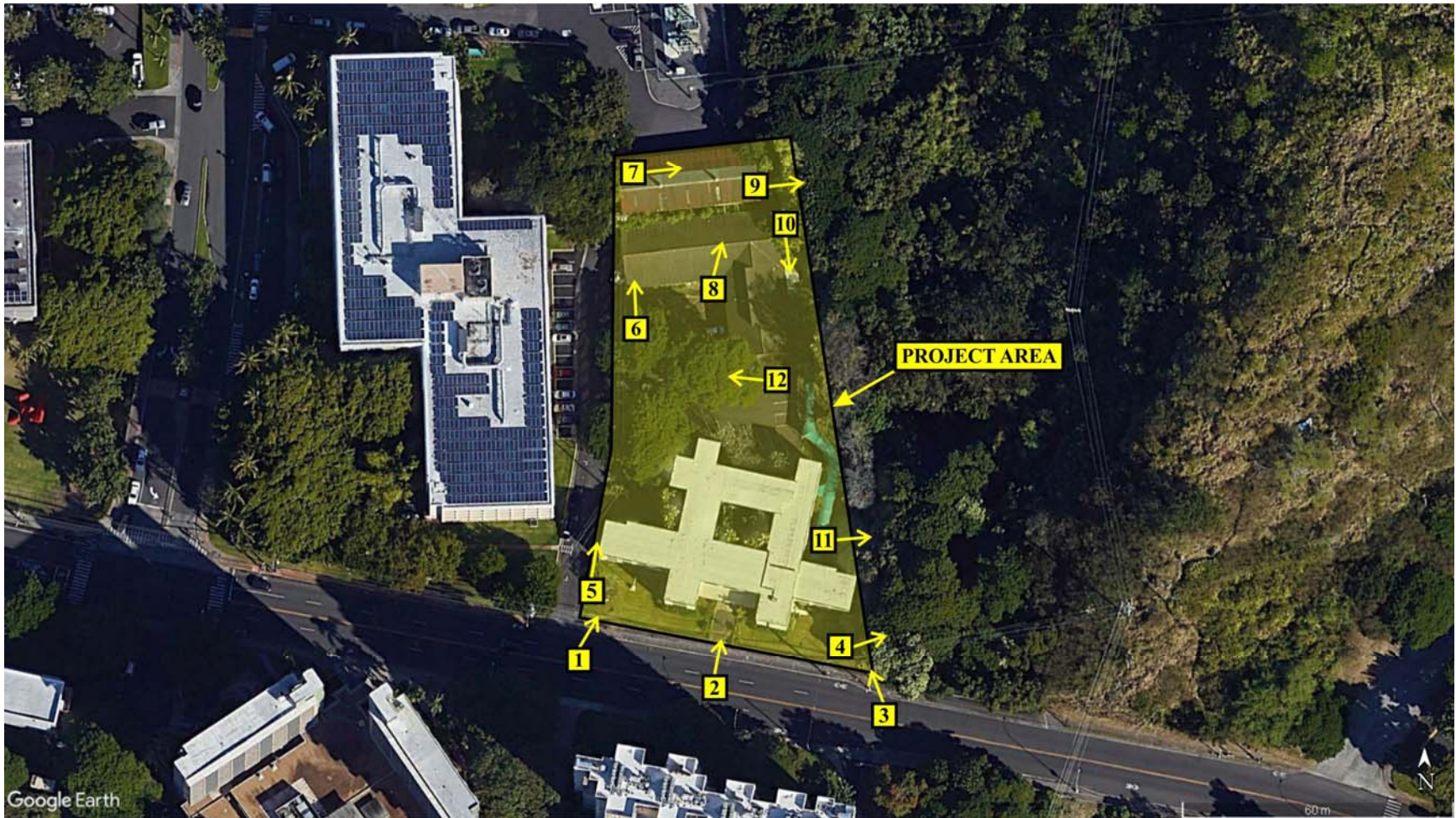


Figure 14: Google Earth (2020) image showing approximate location and direction of photographs taken during the field inspection.



## **SUMMARY AND CONCLUSIONS**

Traditionally, the lands in Mānoa Valley were utilized for fishponds and taro cultivation. The valley once held several hundred fishponds extending a mile inland from the shore. By 1901, urbanization diminished the number of traditional fishponds in Mānoa Valley from several hundred to 14 (Cobb 1905). Taro cultivation continued well into the Historic period along with sugar cane, coffee, and a failed rice farming venture in 1882 (Thrum 1892:116). As early as 1889, the areas within and immediately *makai* of the project area were used as a stone quarry, known as Mo‘ili‘ili Quarry. Although multiple Land Commission Awards (LCA) are located to the south and north of the project area, only LCA 1748 includes the project area (see Figure 6). Land Commission Award 1748 consists of a 7.44-acre parcel of land in Kānewai and is bisected east-west by Dole Street. The north portion of LCA 1748 contains the current project area. Originally awarded to Ono in 1847, LCA 1748 was described solely as a house lot, containing three of Ono’s houses and bounded by a fence (Waihona 2019). Documentation for LCA 1748 is provided as Appendix A. As the University of Hawai‘i expanded, the land in the current project area became the site of the NMFS building and two annex buildings. The NMFS building and the two annex buildings are over 50 years old.

Previous archaeological studies conducted in the vicinity of the current project area yielded the discovery of several human burials, irrigation features, and the subsurface remnants of taro fields (Table 1). The most significant archaeological site in the vicinity of the project area was identified by Cultural Surveys Hawaii (CSH) in 1991 where the remains of at least 18 human burials, midden deposits, and several artifacts were documented along Dole Street near Kānewai Park. The site was designated as SIHP # 50-80-14-4266. Historical research and previous archaeological studies indicate that the area near and within the current project area was used throughout the Historic period for agriculture and/or scattered human habitation. Thus, there is a potential for subsurface archaeological cultural deposits and possibly human burials to exist within the current project area.

Given that the project area was occupied during the historical period and that no archaeological testing was conducted within the project area, an archaeological inventory survey (AIS) is recommended with subsurface testing since the current buildings are going to be demolished and replaced with the construction of the new building. It is also recommended that consultation with the State Historic Preservation Division (SHPD) concerning the archaeological testing occur prior to the start of the AIS project.

## REFERENCES

Barrera, William M. Jr.

- 1985 *Archaeological Survey and Testing of Mānoa Hillside Subdivision, Mānoa Valley Oahu*. Chiniago, Inc., Kamuela, Hawai‘i.

Bath, Joyce

- 1988 *Circle K Burial, Mānoa, Honolulu Oahu*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai‘i.

Bath, Joyce and Carol Kawachi

- 1990 *Oahu Avenue Burial Investigation, Mānoa, Honolulu, O‘ahu Island*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai‘i.

Bayman, James M. and Thomas S. Dye

- 2013 *Hawaii’s Past In A World of Pacific Islands*. SAArchaeological Record, Washington, D.C.

Bloxam, Andrew

- 1825 *Diary of Andrew Bloxam*. Bishop Museum Special Publication 10. Bishop Museum Press, Honolulu, Hawai‘i.

Bouslog, C. and other Mānoa Valley Residents

- 1994 *Mānoa: The Story of a Valley*. Mutual Publishing, Honolulu, Hawai‘i.

Chinen, Jon J.

- 1961 *Original Land Titles in Hawaii*. Copyright 1961 Jon Jitsuzo Chinen. Library of Congress Catalogue Card No. 61-17314.

Cordy, Ross H.

- 2002 *The Rise and Fall of the O‘ahu Kingdom*. Mutual Publishing, Honolulu, Hawai‘i.

Cobb, John N.

- 1905 *The Commercial Fisheries of the Hawaiian Islands in the Bulletin of the United States Fish Commission Vol. XXIII for 190* U.S. Government Printing Office, Washington, D.C.

Daws, Gavin

1968 *Shoal of Time: History of the Hawaiian Islands*. University of Hawai'i Press, Honolulu, Hawai'i.

Douglas, Michelle

1990 *Osteological Analysis in conjunction with Burial Removal Near Keller Hall, UHM, Honolulu, Oahu. Site No, 50-80-14-4191, TMK: 2-8-23:3*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.

Ebisu, Kelcey

1983 *From Stone Quarry to Athletic Complex: The Makai Campus (Acquired 1953)*. In, *Building a Rainbow: A History of the Buildings and Grounds of the University of Hawaii's Mānoa Campus*. Edited by V.N. Kobayashi (pp. 169-178). University of Hawaii at Mānoa, Honolulu, Hawai'i.

Enanoria, Brittany, Constance R. O'Hare, and Hallett H. Hammatt

2016 *Archaeological Inventory Survey Report for the Varsity Parcels Redevelopment Project, Waikīkī Ahupua'a, Honolulu (Kona) District, O'ahu TMKs: [1] 2-8-006:001, 032, 036, 038-043*. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Foote, Donald, Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens

1972 *Soil Survey of the Islands of Kauai, O'ahu, Maui, Molokai and Lanai, State of Hawaii*. United States Department of Agriculture Soil Conservation Service/University of Hawaii Agricultural Experimentation Station, Washington D.C.

Fung Associates, Inc.

2011 *Hawaii Modernism Context Study*. Fung Associates, Inc., Honolulu, Hawai'i.

Giambelluca, Thomas W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid and D.M. Delparte

2013 *Rainfall Atlas of Hawai'i*. Bull. Amer. Meteor. Soc. 94:313-316, doi: 10.1175/BAMS-D-11-00228.1.

Giambelluca, T.W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger.

2014 *Evapotranspiration of Hawai'i*. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai'i.

Hammatt, Hallett H. and David W. Shideler

1991 *Archaeological Disinterment of Inadvertent Finds at Site 50-80-14-4266 on Dole Street, Kānewai, Manoa, Kona District, Oahu*. Prepared for the Board of Water Supply. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Handy, E.S.Craighill

1940 *The Hawaiian Planter, Vol. 1*. B.P. Bishop Museum Bulletin 161, Honolulu, Hawai'i.

Handy, E.S.Craighill, and Elizabeth G. Handy

1972 *Native Planters in Old Hawai'i*. B.P. Bishop Museum Bulletin 233, Honolulu, Hawai'i.

Handy, E.S.Craighill and Mary K. Pukui

1951 The Polynesian Family System in Ka'u Hawai'i. *Journal of the Polynesian Society*, 60(4), 187-222.

Kahn, Jennifer G., Kathy Kawelu, Victoria Wichman, Alan B. Carpenter, Summer Moore, and Terry Hunt

2016 Understanding Variability in the Hinterlands: Settlement and Subsistence in Miloli'i, Kaua'i, Hawaiian Islands. *Archaeology in Oceania* (00):1-18.

Kamakau, Samuel

1991 *Tales and Traditions of the People of Old. Nā Mo'olelo a ka Po'e Kahiko*. B.P. Bishop Museum Press, Honolulu, Hawai'i.

Kelly, Marion

1983 *Nā Māla o Kona: Gardens of Kona*. Dept. of Anthropology Report Series 83-2. B.P. Bishop Museum, Honolulu, Hawai'i.



Kirch, Patrick V.

- 1985 *Feathered Gods and Fishhooks*. University of Hawai'i Press, Honolulu, HI.
- 1992 *Anahulu: The Anthropology of History*, Vol. 1. University of Chicago Press, Chicago, Illinois.
- 2010 *How Chiefs Became Kings: Divine Kingship and the Rise of Archaic States in Ancient Hawai'i*. University of California Press, Berkeley, Los Angeles, London.
- 2011 When Did the Polynesians Settle Hawai'i? A Review of 150 Years of Scholarly Inquiry and a Tentative Answer. *Hawaiian Archaeology*. 12: 3-26.

Kirch, Patrick V. and Marshall Sahlins

- 1992 *Anahulu*. Vols. 1 and 2. University of Chicago Press, Chicago, IL.

Kraus-Friedberg, Chana

- 2008 Transnational Identity and Mortuary Material Culture: The Chinese Plantation Cemetery in Pahala, Hawai'i. *Historical Archaeology* 42(3):123-135.

Kuykendall, Ralph S.

- 1938 *The Hawaiian Kingdom*. University of Hawaii, Honolulu, Hawai'i.

Ladefoged, Thegn and Michael Graves

- 2006 The Formation of Hawaiian Territories. In, *Archaeology of Oceania: Australia and the Pacific Islands*. Edited by Ian Lilley (pp. 259-283). Blackwell Publishing, Malden, MA.

Liston, Jolie and Greg C. Burtchard

- 1996 Kāpapa Lo'i 'o Kānewai. Archaeology at the Center for Hawaiian Studies, University of Hawai'i at Mānoa. Prepared for Kauahikaua & Chun Architects. International Archaeological Research Institute, Inc., Honolulu, Hawai'i.

Lucas, Paul F. Nahoā

- 1995 *A Dictionary of Hawaiian Legal Land-Terms*. University of Hawai'i Press. Honolulu, Hawai'i.

Lyons, Curtis J.

- 1875 Land Matters in Hawai'i. *The Islander*, Vol. I. Honolulu, Hawai'i.

McAllister, J. Gilbert

1933 *Archaeology of Oahu*. Bernice P. Bishop Museum Bulletin 104. B.P. Bishop Museum, Honolulu, Hawai'i.

Menzies, Archibald

1920 *Hawaii Nei, 128 Years Ago*. Edited by William F. Wilson. The New Freedom Press, Honolulu, Hawai'i.

O'Hare, Constance R., David W. Shideler, and Hallett H. Hammatt

2007 *Archaeological Literature Review and Field Inspection for Kamehameha Schools University Parcels and Varsity Theater Parcel, TMK: (1) 2-8-006:001, 020, 023, 025, 032, 036, 038, 039, 040, 041, 042, 043, 048, 052, 057, 058; 2-8-024:013, 030, 031, 032, 033, 034; 2-8-025:047, 048, 049, 050, 051, 052, 053, 054 in Mānoa, Waikīkī Ahupua'a, Honolulu District, O'ahu Island*. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Shideler, David W. and Hallett H. Hammatt

2008 *Archaeological Literature Review and Field Inspection Report for the University of Hawai'i at Mānoa Long Range Development Plan Project, Mānoa Ahupua'a, Kona District, O'ahu Island, TMKs [1] 2-8-015:001; 2-8-023:003; 2-9-004:005; 2-9-023:001 & 026; 2-8-029:001; 2-9-026:001 and 037; 2-9-027:054; 3-3-056:001 and 004*. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Smith, Marc and Carol Kawachi

1989 *Burial Removal near Keller Hall, UHM, Honolulu, O'ahu. Site No. 50-80-144191, TMK: 2-8-23:3*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.

Thomas, Frank R.

1995 Excavations at Maunalua Cave, Hawai'i Kai, O'ahu. *Hawaiian Archaeology* 4:17-26

Thrum, Thomas G.

1892 Mānoa Valley. In, *Hawaiian Almanac and Annual for 1892*. T.G. Thrum, Honolulu, Hawai'i.

Tomonari-Tuggle, M.J.

1998 *Proposed National Marine Fisheries Service Honolulu Laboratory Renewal Project: Historical Research and Assessment of Archaeological Potential*. International Archaeological Research Institute, Inc. Honolulu, Hawai'i.

Vancouver, George

1798 *A Voyage of Discovery to the North Pacific Ocean, and Round the World*,  
Volumes 1-3. Robinson and Edwards, London.

Waihona 'Aina Corporation

2019 Māhele Database, [www.waihona.com](http://www.waihona.com). Kaneohe, Hawai'i.

Wolforth, Thomas R. and Alan E. Haun

1996 *Archaeological Inventory Survey for the Kamoku-Pukele 138-kV Transmission  
Line Alignments. Lands of Mānoa, Pālolo, and Waikīkī, Honolulu District, Island  
of O'ahu (TMK: 2-7, 2-8, 2-9, 3-2, 3-3, 3-4)*. Paul H. Rosendahl, Ph.D., Inc.,  
Hilo, Hawai'i.

**APPENDIX A: LAND COMMISSION AWARD 1748 DOCUMENTATION**



**Mahele Record: 01748**

Claim Number:	01748
Claimant:	Ono
Other claimant:	
Other name:	
Island:	Oahu
District:	Kona
Ahupuaa:	Waikiki
Ili:	Kanewai

Apana:	1	Awarded:	1
Lol:	0	FR:	
Plus:		NR:	238v3
Mala Taro:	0	FT:	174v3
Kula:	0	NT:	500v3
House lot:	1	RP:	072
Kihapai/Pakana:	0	Number of Royal Patents:	1
Salt lands:	0	Koala/Poolima:	No
Waike:	0	Loko:	No
Oloha:	0	Lokola:	No
Noni:	0	Fishing Rights:	No
Hala:	0	Sea/Shore/Dunes:	No
Sweet Potatoes:	0	Auwai/Ditch:	No
Irish Potatoes:	0	Other Edifice:	No
Bananas:	0	Spring/Well:	No
Breadfruit:	0	Pigpen:	No
Coconut:	0	Road/Path:	No
Coffee:	0	Burial/Greaveyard:	No
Oranges:	0	Wall/Fence:	No
Bitter Melon/Gourd:	0	Stream/Mulwai/River:	No
Sugar Cane:	0	Pali:	No
Tobacco:	0	Disease:	No
Koa/Koa Trees:	0	Claimant Died:	No
Other Plants:	0	Other Trees:	0
Other Mammals:	No	Miscellaneous:	

**Document Text**

**No. 1748, Ono**  
**N.R. 238v3**

The Land Commissioners, House of the Privy Council, Greetings: I, the undersigned, hereby state my claim for a house lot in the 'ili of the konohiki, Kalama, and Maneo is also konohiki of this house lot. My house lot is between the 'ilis of these konohikis. I got this house-lot in 1839. It is bounded on the north by the land of Nika, on the east and south by the land of Kalama, on the west by Maneo's land. This is what I have to tell you concerning my house lot claim.

ONO X, his mark

December 3, 1847, Kanewai

**F.T. 174v3**

No. 1748, Ono

Lehuanui, This is in Kanewai, Waititi, house lot, 3 houses of Ono's, fenced.

Mauka, stream & Kaluhinenui  
Waialae, Kalama  
Makai, Kauo  
Honolulu, my land.

Claimant had this land from Kalama in time of Kinau, and has held it undisputed to this time.

Kawelo, confirmed the above.

N.T. 500v3

No. 1748, Ono, October 25, 1849

Lehuanui, sworn, I have seen his land at Kanewai, Waikiki.

1 house-lot, Ono has three houses, which are half enclosed and the boundaries are:

Mauka by Kaluhinenui  
Waialae by Kalama  
Makai by Kauo  
Honolulu by my place.

Ono's place is from Kalama given before the year 1839; no one has objected to the present time.

Kawelo, sworn, Our testimonies are similar; no one has objected.

[Award 1748; R.P. 4972; Kanewai Manoa Kona; 1 ap.; 7.44 Acs]

01748 - No maps found.

Reference: | Doc: 2525 | Date Time: 12/12/2019 4:00:06 AM  
© 2000-2019 Waihona 'Aina. All rights reserved.

**APPENDIX B: FIELD INSPECTION PHOTOGRAPHS**























B7













B10





B11





B12





B13

# **APPENDIX D**

---

Reconnaissance Level Surveys





**7. Property Description:**

7.1) Date of Construction:

7.2) Provide a description of the property, including the character defining features, summarize alterations to the property, and provide an evaluation of the property's integrity of materials, design, feeling, location, association, workmanship, and setting.

## Annex I

Date of Construction: ca. 1951

### Description

The one-story Annex I building is located behind the Laboratory and Administrative building. It is L-shaped with a northern wing extending east west, and an eastern wing extending north south. The northeast corner of the building is inset, with a partially covered, fenced open area housing disused refrigeration equipment. The building has a gable roof with a shed roof monitor on the east wing that has fixed louver vents. It has a concrete slab foundation, and metal structural framing. Its roof is clad in corrugated cement panels, as are most of its walls. Two wall areas have different materials. At the western end of the north wing there is a lanai that is enclosed with extruded wire on three sides. The westernmost wall is mostly made up of extruded wire panels on a ceiling-mounted sliding track. The screen is split into two sections, one on the north, and one on the south with a chain link gate between the two. Each screen section slides inward, parallel to the north and south walls. A section of wall at the northeast of the building is covered in stucco, and an additional portion of wall, in the refrigeration equipment inset area, is bare concrete masonry unit construction. Both of these wall portions appear to be alterations to the original walls. Additionally, at the south end of the east wing, a decorative breezeblock wall has been added to the exterior of the corrugated cement wall. This material is also used to create a screened porch entryway on this end of the building. Along the eastern side of the eastern wing is a screened lanai that overlooks Mānoa Stream. The north wing of the building has doors on both the north and south side, as well as one visible in the western wall between the building and lanai. The north personnel door is corrugated metal, the west personnel door is corrugated cement, the south personnel door is flush metal, and the two south equipment/large doors are extruded metal screen double-hinged doors with extruded screen transoms. The east wing has one door on the west side, and two doors on the south side. The west side door is a flush metal personnel door, which appears to have been inserted into the opening for a third equipment door. One south door is centered on the façade, and is an aluminum frame storefront type door with full side lights. The second door is at the extreme east of the façade, behind a chain link gate, and is a non-historic screen door. The building's windows are all located on the south and west walls of the north and east wings, respectively. These are single fixed pane, aluminum frame sash, single on the south wall, and double on the west.

### Integrity

Annex I retains integrity of location, design, setting, and workmanship. Integrity of materials is slightly diminished due to the stucco and CMU portions on the rear walls. Integrity of feeling and association are somewhat diminished by the change in use of the three buildings; however, Annex I retains its spatial and visual relationship to both of the other associated buildings on the property.

### Historical Background

Tax records do not include a construction date for this building. The first record found of its existence is a 1952 aerial photography. (It was not shown on a 1953 USGS map, however). Tax office records for the parcel indicate an increase in the value of improvements between 1951 and 1952 by nearly \$43,000, which supports the estimated 1951 construction date. In the 1960 account of the complex, this building was described as providing additional space for "biological collections, six large concrete aquaria for experimental purposes, a cold storage refrigeration plant, a garage, and a work shop." (Honolulu Biological Laboratory. Past (1949-1958), Present (1959), Future (1960-). Hawaii Area Office: Department of the Interior. April, 1960.) The garage appears to be the western end of the northern wing, although by this time the third building in the complex had also been completed, and may have been used for garage space. Its overall footprint today is the same as shown in the 1952 aerial photograph, indicating that any alterations did not add significant floor space to the building.

## Annex II (Garage)

Date of Construction: ca. 1955

Annex II is rectangular in plan, with long sides on the north and south. It is one story, with a side-gable roof that has close eaves on three sides. The eaves are extended on the north side to protect the doors that stretch along this side; there are a series of three mechanical vents at the roof ridge, and large, square, galvanized metal gutters and downspouts. The building has a concrete slab foundation that varies in height due to the slight slope of the property. This means that the entries on the north side of the building are at ground level, and above ground level at the south side. The building's structure is metal frame. Its walls and roof are entirely clad in corrugated metal panels. Doors are located on all four sides of the building. On the east and west gable ends, the doors are flush metal personnel type, and are reached by concrete walks or pads. On the south, the single personnel door is made of a corrugated metal panel on hinges, with a steep concrete ramp that extends to the rear of Annex I. The north doors are primarily vehicular, with one flush metal personnel door inset into one of these vehicular doors near the east end. The corrugated metal vehicular doors open by sliding along a series of tracks. Above these doors is a continuous opening that may have contained extruded screen, but is now entirely open. The building has two types of windows. The first are located on the west end and south side, and are steel-framed nine-light windows with awning operation in the top six lights. The second type are located on the east end and southeast side, and are narrow aluminum-frame sash of unknown operation. There are also square fixed louver vent panels at each gable end, movable louver vent panels on the east end and southeast side, and a galvanized vent stack above the east end window.

### Integrity

Annex I retains integrity of location, design, materials, setting, and workmanship. Integrity of feeling and association are somewhat diminished by the change in use of the three buildings; however, Annex II retains its spatial and visual relationship to both of the other associated buildings on the property.

### Historical Background

This building was the last of the three buildings on the property to be constructed. It is not mentioned in contemporaneous articles or accounts of the fishery complex, but appears in maps/aerial images by 1959. Tax office records for the parcel indicate an increase in the value of improvements between 1955 and 1956 by more than \$55,000, indicating a possible construction year of 1955. The building appears to have had no additions, or significant alterations since its construction. A few minor alterations to the building appear to be the added corrugated metal door with a concrete ramp on the south side, and the electrical conduits that connect the building to the nearby building to the south. A window may have been removed and filled with a corrugated metal panel on the east end; however the size of the fill is not the same as any existing window on the building, and therefore may be a patch.



**8. Eligibility Recommendation:**

8.1) Provide a recommendation of eligibility to the Hawai'i Register of Historic Places including applicable criteria and areas of significance.

**Sources**

9. Attach Photographs: provide sufficient photographs to illustrate the property’s main features. At a minimum provide the following:

Quantity	Description
1-2	Street view(s) of the resource and setting
1-2	Main Facades
1-2	interior photos(s) if applicable

10. Attach Map showing the location of the property

**CHECKLIST**

---

**Reconnaissance Level Survey Form** (this form)

**Photographs**

**Map**

**Filing Fee Form**

**SIHP Request Form**



View of the former Laboratory and Administration Building fronting Dole. (Source: MASON)



View of the former Laboratory and Administration Building front entrance. (Source: MASON)





Covered walkway near front entrance with peeling paint. Source: MASON)



Original stair and rock wall at front entrance. (Source: MASON)



Rear view of former Laboratory and Administration Building. (Source: MASON)

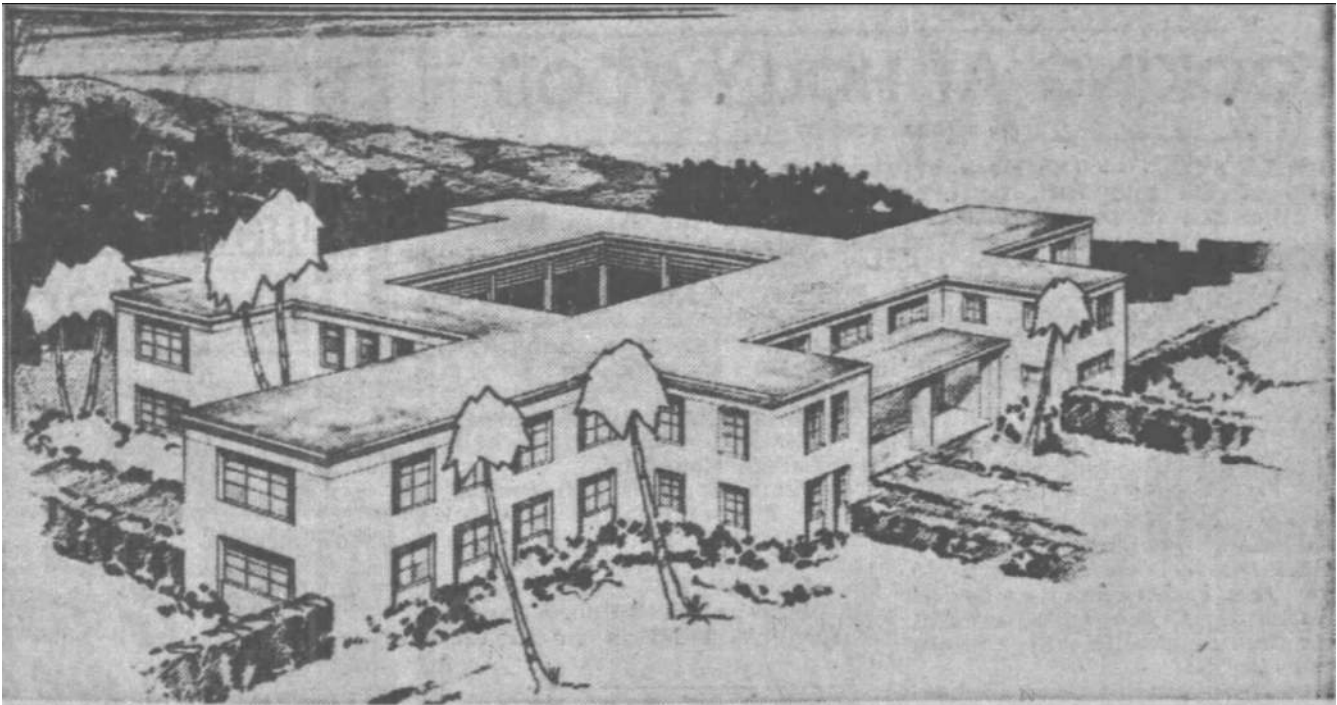


Rear walkway (Source: MASON)



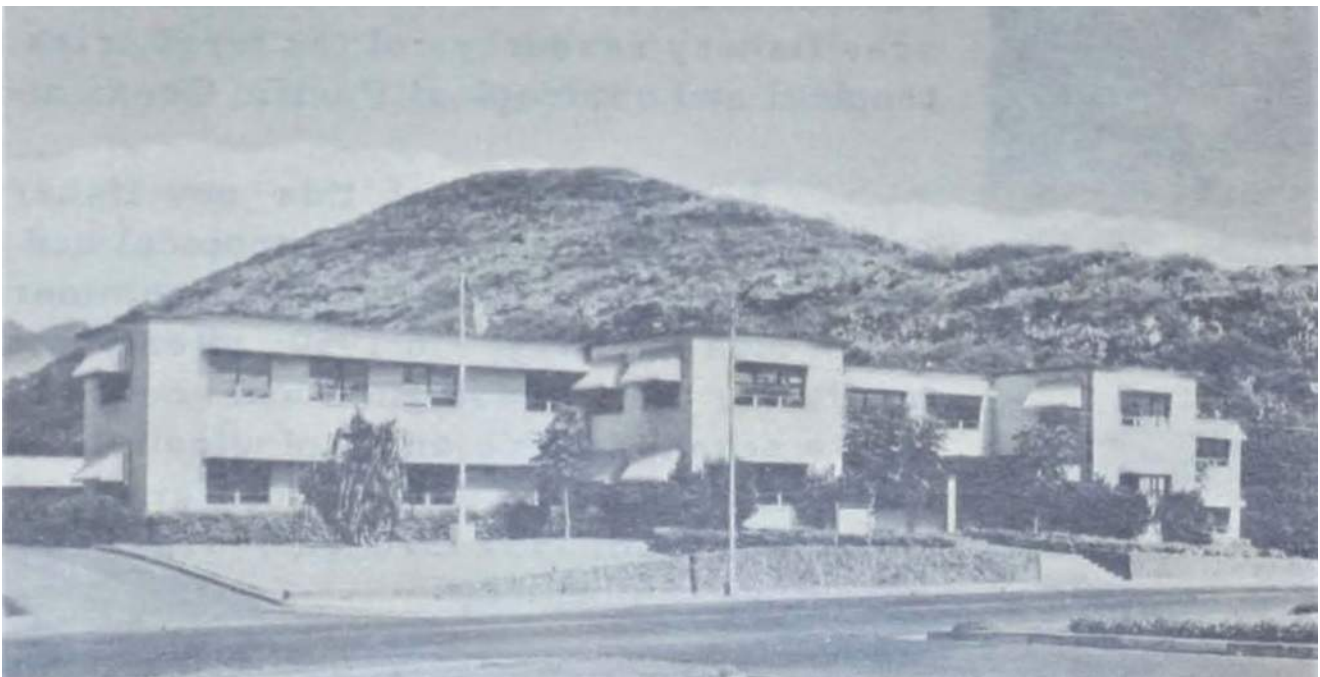
In-filled windows at front. (Source: MASON)





**FISHERIES STUDY HEADQUARTERS**—This modern fireproof building will be constructed on the University of Hawaii campus to serve as administrative headquarters for the **Pacific Ocean fishery** investigation now being conducted by the U. S. department of interior's division of wildlife. Bids for the construction, expected to cost nearly \$250,000, will be opened June 15. Headquarters for the study, which will operate three ocean-going vessels as well as extensive laboratory facilities, will move here from San Francisco as soon as the building is completed. Guy N. Rothwell of Honolulu is the **architect.**

Rendering of former Laboratory and Administration Building by Rothwell. (Source: Honolulu Advertiser, May 18, 1949. P. 7.)



View of the former Laboratory and Administration Building ca.1960. (Source: USFWS, Honolulu Biological Laboratory, Past (1949-1958), Present (1959) Future (1960-), 1960.)



Annex I Southwest sides showing screened west end monitor vents and double screen doors



Annex I South end showing main entry with decorative breezeblock walls and entry porch.





Annex I, north side showing corrugated cement wall panels and screened ventilation strip



Annex I, west end showing screened area with sliding screen doors.



Annex I, entry to east side screened lanai showing breezeblock and chain link gate.





Annex II showing north side sliding vehicular doors with inset personnel door.



Annex II showing north side sliding vehicular doors with inset personnel door.





Annex II, south side, showing steel-frame windows and electrical connection to Annex I.



Annex II, east end showing flush entry door and aluminum frame window.





Map: Location of former Laboratory and Administration Building, Annex I and Annex II, 2570 Dole Street.

# **APPENDIX E**

---

Traffic Impact Report

## Traffic Impact Report

---

# *University of Hawaii Design-Build Multifamily Mixed-Use Project*



Prepared for:  
Belt Collins Hawaii, LLC

Prepared by:  
Wilson Okamoto Corporation

July 2020

***TRAFFIC IMPACT REPORT***  
***FOR THE***  
***UNIVERSITY OF HAWAII***  
***DESIGN-BUILD MULTIFAMILY MIXED-USE PROJECT***

*Prepared for:*

Belt Collins Hawaii LLC  
2153 North King Street, Suite 200  
Honolulu, HI 96819

*Prepared by:*

Wilson Okamoto Corporation  
1907 S. Beretania Street, Suite 400  
Honolulu, Hawaii 96826  
WOC Ref #10551-01

July 2020



**TABLE OF CONTENTS**

	Page
I. Introduction .....	1
A. Purpose of Study .....	1
B. Scope of Study .....	1
II. Project Description .....	2
A. Location .....	2
B. Project Characteristics .....	2
III. Existing Traffic Conditions.....	5
A. Area Roadway System .....	5
B. Traffic Volumes and Conditions.....	5
1. General .....	5
a. Field Investigation .....	5
b. Capacity Analysis Methodology.....	6
2. Existing Peak Hour Traffic .....	7
a. General .....	7
b. Dole Street and Lower Campus Road.....	7
c. Dole Street and East-West Road.....	10
d. Dole Street and St. Louis Drive.....	11
IV. Projected Traffic Conditions .....	12
A. Site-Generated Traffic.....	12
1. Trip Generation Methodology .....	12
2. Trip Distribution .....	14
B. Other Considerations.....	14
1. UHM 2019 Long Range Development Plan (LRDP) Update .....	14
2. Atherton Mixed-Use Student Housing Innovation and Entrepreneurship Center.....	16
C. Total Traffic Volumes Without Project.....	17
D. Total Traffic Volumes With Project .....	19
V. Traffic Impact Analysis .....	21

VI.	Multimodal Facilities.....	22
A.	Pedestrian Facilities.....	22
B.	Bicycle Facilities.....	22
C.	Transit Facilities.....	25
VII.	Recommendations.....	27
VIII.	Conclusion .....	28

## **LIST OF FIGURES**

FIGURE 1	Location Map and Vicinity Map
FIGURE 2	Proposed Site Plan
FIGURE 3	Existing Lane Configurations
FIGURE 4	Existing Peak Hours of Traffic
FIGURE 5	Distribution of Site-Generated Vehicles With Project
FIGURE 6	Year 2025 Peak Hours of Traffic Without Project
FIGURE 7	Year 2025 Peak Hours of Traffic With Project
FIGURE 8	On-Site Multimodal Facilities
FIGURE 9	Existing and Proposed Bicycle Facilities
FIGURE 10	Transit Facilities

## **LIST OF APPENDICES**

APPENDIX A	Existing Traffic Count Data
APPENDIX B	Level of Service Definitions
APPENDIX C	Capacity Analysis Calculations Existing Peak Period Traffic Analysis
APPENDIX D	Capacity Analysis Calculations Projected Year 2025 Peak Period Traffic Analysis Without Project
APPENDIX E	Capacity Analysis Calculations Projected Year 2025 Peak Period Traffic Analysis With Project

## **I. INTRODUCTION**

### **A. Purpose of Study**

The purpose of this study is to identify and assess the traffic impacts resulting from the University of Hawaii Design-Build Multifamily Mixed-Use Project (hereafter referred to as the “UHM Multifamily development”) located near the southeast corner of University of Hawaii in Manoa on the island of Oahu. The proposed project is one of two public-private partnership (P3) developments initiated by the University of Hawaii at Manoa (UHM) to facilitate the development of additional student and faculty housing facilities on campus. The proposed UHM Multifamily development entails the redevelopment of the former National Oceanic and Atmospheric Administration (NOAA) site into a new mixed-use development that is expected to include residential, commercial, and child care uses for UHM faculty and students. It should be noted that the P3 developments including the UHM Multifamily development is permitted under an amendment to the 2007 Long Range Development Plan (LRDP) 2009 Plan Review Use (PRU) and identified as part of the UHM 2019 LRDP Update, a planning document which outlines the capital improvements for the university for the next 10 years. However, the P3 developments are being considered separately from the LRDP for the purpose of permitting, with traffic assessments prepared separately for those developments.

### **B. Scope of Study**

This report presents the findings and conclusions of the traffic study, the scope of which includes:

1. Description of the proposed project.
2. Evaluation of existing roadway and traffic operations in the vicinity.
3. Analysis of future roadway and traffic conditions without the proposed project.
4. Analysis and development of trip generation characteristics for the proposed project.
5. Superimposing site-generated traffic over future traffic conditions.
6. The identification and analysis of traffic impacts resulting from the proposed project.



7. Recommendations of improvements, if appropriate, that would mitigate the traffic impacts resulting from the proposed project.

## **II. PROJECT DESCRIPTION**

### **A. Location**

The existing site for the proposed UHM Multifamily development is located on the southeast corner of the upper campus to the University of Hawaii in Manoa on the island of Oahu (see Figure 1). The project site is bounded by Dole Street to the south, the Manoa Stream to the east, and university uses to the north and west. The project site is further identified as Tax Map Key (TMK): 2-8-023: 009. Access to the project site is expected to be provided via driveways off East-West Road and Dole Street.

### **B. Project Characteristics**

The proposed project entails the redevelopment of the former NOAA building into a new mixed-use development that will include the following:

- 400 multifamily units
- ~2,000 sf of commercial uses
- Child care uses for ~128 students

Parking for the day care and restaurant uses is expected to be provided on-site with a limited number of short-term loading/unloading stalls provided for the development's residential uses. Long-term parking will not be provided for the residential uses since residents are primarily expected to be students and faculty of the university. Access to the project site will be provided via internally connected driveways off Dole Street and East-West Road. Primary access to the project site will be provided via an existing two-way driveway off Dole Street. Secondary access is expected to be provided via an existing two-way driveway off East-West Road that currently serves an adjacent university parking lot. Although most vehicles accessing the project site are expected to utilize the Dole Street driveway, vehicles associated with the child care uses are expected to enter via the Dole Street driveway and exit via the East-West Road driveway. The proposed development is expected to be completed and occupied by the Year 2025. Figure 2 shows the proposed project site plan.





UNIVERSITY OF HAWAII DESIGN-BUILD MULTIFAMILY MIXED-USE PROJECT

PROPOSED SITE PLAN

FIGURE

2



### **III. EXISTING TRAFFIC CONDITIONS**

#### **A. Area Roadway System**

In the vicinity of the project site, Dole Street is a predominantly four-lane, two-way roadway generally oriented in the east-west direction. Near the southwest corner of the project site Dole Street intersects East-West Road. At this signalized intersection, the eastbound approach of Dole Street has two lanes that serve left-turn and through traffic movements while the westbound approach has two lanes that serve through and right-turn traffic movements. East-West Road is generally oriented in the north-south direction providing access through the upper campus of the university. At the intersection with Dole Street, the southbound approach of East-West Road has an exclusive left-turn lane and an exclusive right-turn lane.

West of the intersection with East-West Road, Dole Street intersects Lower Campus Road. At this signalized T-intersection, the eastbound approach of Dole Street has two through lanes and an exclusive right-turn lane while the westbound approach has two lanes that serve left-turn and through traffic movements. Lower Campus Road is generally oriented in the north-south direction that serves as the main access road through the lower campus of the university. At the intersection with Dole Street, the Lower Campus Road approach has exclusive turning lanes.

East of the intersection with East-West Road, Dole Street intersects St. Louis Drive. At this unsignalized intersection, the eastbound approach of Dole Street has an exclusive left-turn lane and an exclusive right-turn lane. St. Louis Drive is generally oriented in the north-south direction providing access to/from Waialae Avenue. At the intersection with Dole Street, the northbound approach of St. Louis Drive has an exclusive left-turn lane and one through lane, while the southbound approach has one through lane and an exclusive right-turn lane.

#### **B. Traffic Volumes and Conditions**

##### **1. General**

##### **a. Field Investigation**

Field investigations were conducted on April 18-23, 2019 which consisted of manual turning movement count surveys during the



morning peak hours between 6:00 AM and 9:00 AM, and the afternoon peak hours between 3:00 PM and 6:00 PM at the following intersections:

- Dole Street and Lower Campus Road
- Dole Street and East-West Road
- Dole Street and St. Louis Drive

Appendix A includes the existing traffic count data.

**b. Capacity Analysis Methodology**

The highway capacity analysis performed in this study is based upon procedures presented in the “Highway Capacity Manual” (HCM), Transportation Research Board, 2000, and the “Synchro” software, developed by Trafficware. It should be noted that the HCM 2010 methodology is available with the Synchro software; however, analysis conducted using that methodology is unable to accommodate all the exclusive and shared-lane use configurations in the study area. As such, for the purpose of this report, the HCM 2000 methodology output was used. The analysis is based on the concept of Level of Service (LOS) to identify the traffic impacts associated with traffic demands during the peak periods of traffic.

LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS “A” through “F”; LOS “A” representing ideal or free-flow traffic operating conditions and LOS “F” unacceptable or potentially congested traffic operating conditions.

“Volume-to-Capacity” (v/c) ratio is another measure indicating the relative traffic demand to the road carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at or near capacity. A v/c ratio of greater than 1.00 indicates that the traffic demand exceeds the road’s carrying capacity. The LOS definitions are included in Appendix B.

## **2. Existing Peak Hour Traffic**

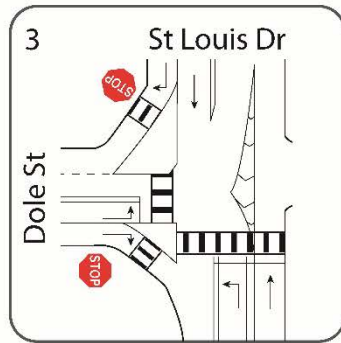
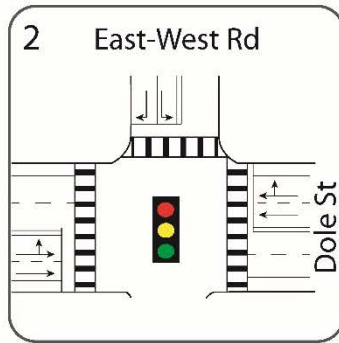
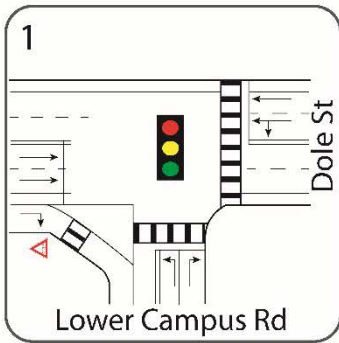
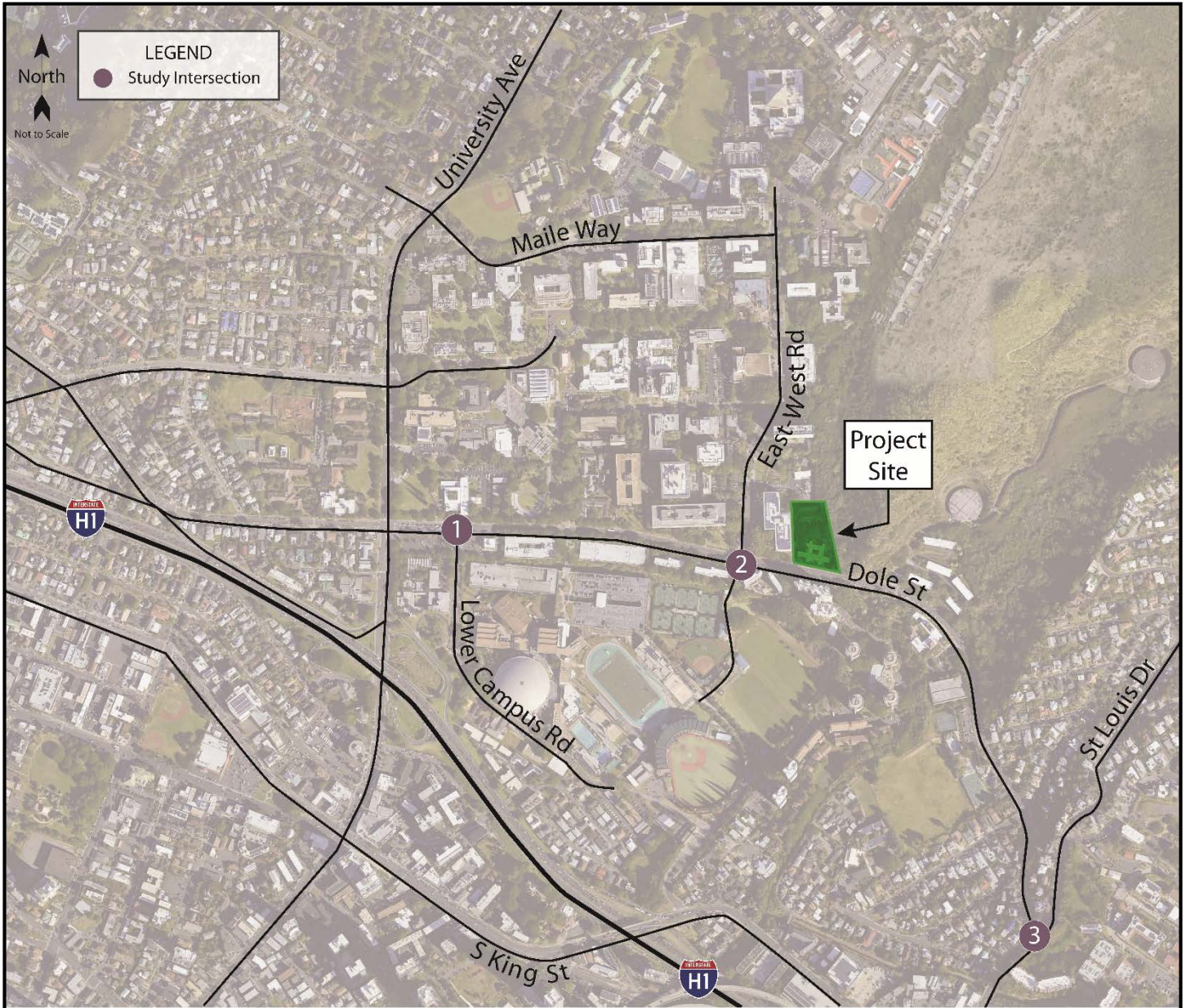
### **a. General**

Figures 3 and 4 show the existing lane uses and peak traffic volumes. The AM peak hour of traffic generally occurs between 7:00 AM and 8:00 AM, while the PM peak hour of traffic generally occurs between 4:15 PM and 5:15 PM. The analysis is based on these peak hour time periods for each intersection to identify the traffic impacts resulting from the proposed project. LOS calculations are included in Appendix C.

### **b. Dole Street and Lower Campus Road**

At the intersection with Lower Campus Road, Dole Street carries 1,046 vehicles eastbound and 648 vehicles westbound during the AM peak period. During the PM peak period overall traffic volumes are less with 1,048 vehicles traveling eastbound and 468 vehicles traveling westbound. The eastbound and westbound approaches of Dole Street operate at LOS “A” during both peak periods. Traffic queues occasionally formed on the Dole Street approaches of the intersection with the most significant queueing observed during the PM peak period. Average queue lengths of 3-4 vehicles were observed on the eastbound approach while average queue lengths of 5-7 vehicles were observed on the westbound approach during the same peak period. Field observation indicates that queues formed along Dole Street from the downstream intersection with University Avenue typically extended through this intersection.

Lower-Campus Road carries 73 vehicles northbound during the AM peak period and 504 vehicles northbound during the PM peak period. The Lower-Campus Road approach operates at LOS “B” during both peak periods. Traffic queues occasionally formed on this approach with the most significant queueing observed during the PM



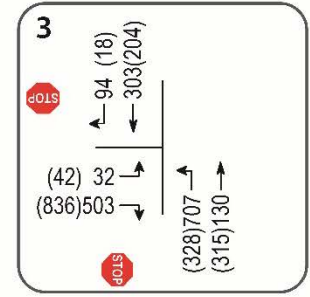
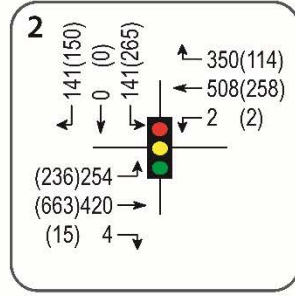
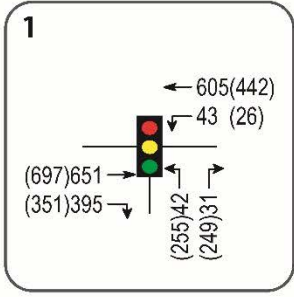
UNIVERSITY OF HAWAII  
 DESIGN-BUILD MULTIFAMILY MIXED-USE PROJECT

EXISTING LANE CONFIGURATIONS

FIGURE

3





**UNIVERSITY OF HAWAII  
DESIGN-BUILD MULTIFAMILY MIXED-USE PROJECT**

**EXISTING PEAK HOURS OF TRAFFIC**

**FIGURE  
4**



peak period. Average queue lengths of 4-6 vehicles were observed during this peak period. As previously discussed, traffic queues at this intersection are influenced by the queues formed along Dole Street at the downstream intersection with University Avenue.

Pedestrian crossings are provided across Dole Street on the east side of the intersection as well as across Lower Campus Road on the south side of the intersection. During the AM peak period, 123 pedestrians were observed crossing Dole Street on the east side of the intersection, while 20 pedestrians were observed crossing the Lower Campus Road on the south side of the intersection. During the PM peak period, 146 pedestrians were observed crossing Dole Street on the east side of the intersection while 95 pedestrians were observed crossing Lower Campus Road on the south side of the intersection.

**c. Dole Street and East-West Road**

At the intersection with East-West Road, Dole Street carries 678 vehicles eastbound and 860 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is lower with 914 vehicles traveling eastbound and 374 vehicles traveling westbound. The eastbound approach operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively while the westbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively. Traffic queues formed occasionally on the eastbound and westbound approaches of the intersection with average queue lengths of 4-6 vehicles observed during the AM peak period and average queue lengths of 3-5 vehicles during the PM peak period.

East-West Road carries 284 vehicles southbound during the AM peak period and 418 vehicles during the PM peak period. The northbound approach operates at LOS "C" and LOS "B" during the AM and PM peak periods, respectively. Traffic queues occasionally

formed on the East-West Road approach of the intersection with the most significant queuing observed during the PM peak period. Average queue lengths of 4-5 vehicles were observed during that peak period.

Pedestrian crossings are provided across Dole Street on the east and west sides of the intersection as well as across East-West Road on the north side of the intersection. During the AM peak period, 45 pedestrians and 104 pedestrians were observed crossing on the east and west sides of the intersection, respectively, while 20 pedestrians were observed crossing East-West Road on the north side of the intersection. During the PM peak period, 99 pedestrians and 285 pedestrians were observed crossing the east and west sides of the intersection, respectively, while 21 pedestrians were observed crossing East-West Road on the north side of the intersection.

**d. Dole Street and St. Louis Drive**

At the intersection with St. Louis Drive, Dole Street carries 535 vehicles eastbound during the AM peak period and 878 vehicles during the PM peak period. The eastbound approach operates at LOS “D” and LOS “E” during the AM and PM peak periods, respectively. Traffic queues occasionally formed on the eastbound approach of the intersection with average queue lengths of 6-8 vehicles observed during both peak periods. Field observation indicates that the high volume of right-turning vehicles from the stop-controlled approach contribute to the low levels of service at this intersection.

St. Louis Drive carries 837 vehicles northbound and 397 vehicles southbound during the AM peak period. During the PM peak period the overall traffic volume is lower with 643 vehicles traveling northbound and 222 vehicles traveling southbound. The northbound left-turn movement operates at LOS “B” and LOS “A” during the AM and PM peak periods, respectively. Traffic queues occasionally

formed on the northbound approach of the intersection with the most significant queuing observed during the AM peak period. Average queue lengths of 4-5 vehicles were observed on the northbound approach during that peak period.

Pedestrian crossings are provided across Dole Street on the west side of the intersection, as well as across St. Louis Drive on the south side of the intersection. During the AM peak period, 18 pedestrians were observed crossing Dole Street on the west side of the intersection, while 30 pedestrians were observed crossing St. Louis Drive on the south side of the intersection. During the PM peak period, 4 pedestrians were observed crossing Dole Street on the west side of the intersection, while 17 pedestrians were observed crossing St. Louis Drive on the south side of the intersection.

#### **IV. PROJECTED TRAFFIC CONDITIONS**

##### **A. Site-Generated Traffic**

###### **1. Trip Generation Methodology**

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in “Trip Generation, 10<sup>th</sup> Edition,” 2017. The ITE trip generation rates are developed empirically by correlating vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per student or 1,000 square feet of development. It should be noted that for the purpose of trip generation, the land use fast food restaurant was used to encompass the proposed commercial uses which are expected to include a coffee shop with grab-and-go food and beverage options. In addition, since the proposed residential uses are intended for students and faculty of the university, long-term parking stalls are not expected to be provided for residents. As such, the residential uses of the proposed project are not expected to generate external trips. The trip generation methodology developed by ITE also includes provisions for multi-

modal trips. Multi-modal trips are trips made utilizing non-motorized modes of travel such as walking and biking, as well as trips made using transit. Due to the proximity of the proposed project to the UHM campus, a significant portion of the trips to/from the site are expected to be walking or biking trips. In addition, the project site is served by established bus routes that may be accessed via pedestrian facilities along Dole Street and East-West Road. As such, the trips generated by the proposed project were adjusted to account for students using alternate modes of transportation. The modal split for trips generated by the project was based on the results of a transportation survey included in the Campus Transportation Demand Management Plan (2012) prepared for the University of Hawaii. Table 1 summarizes the trip generation characteristics related to the proposed project applied to the AM and PM peak hours of traffic.

**Table 1: Adjusted Existing Peak Hour Trip Generation**

<b>FAST FOOD RESTAURANT (WITHOUT DRIVE-THRU)</b>		
INDEPENDENT VARIABLE:		1,000 sf of development = 2.0
		<b>PROJECTED TRIP ENDS</b>
AM PEAK	ENTER	9
	EXIT	6
	TOTAL	15
PM PEAK	ENTER	8
	EXIT	8
	TOTAL	16
<b>DAY CARE CENTER</b>		
INDEPENDENT VARIABLE:		Number of students = 128
		<b>PROJECTED TRIP ENDS</b>
AM PEAK	ENTER	16
	EXIT	14
	TOTAL	30
PM PEAK	ENTER	14
	EXIT	16
	TOTAL	30



**Table 1: Adjusted Existing Peak Hour Trip Generation (Cont'd)**

<b>TOTAL</b>		
		<b>PROJECTED TRIP ENDS</b>
AM PEAK	ENTER	25
	EXIT	20
	TOTAL	45
PM PEAK	ENTER	22
	EXIT	24
	TOTAL	46

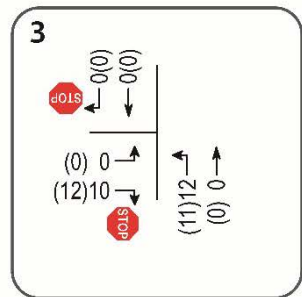
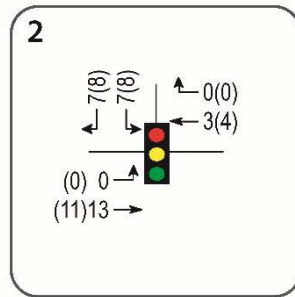
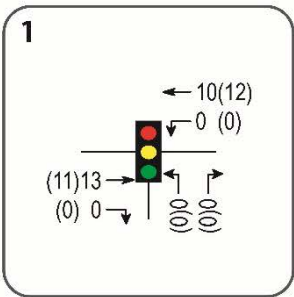
**2. Trip Distribution**

Figure 5 shows the distribution of site-generated traffic during the AM and PM peak periods. Access to the proposed project is expected to be provided via driveways off Dole Street and East-West Road with those accessing the child care center to enter via the Dole Street driveway and exit via the driveway off East-West Road. Those accessing the restaurant uses are expected to enter and exit via the driveway off Dole Street. The directional distribution of all site-generated vehicles was based upon the directional distribution of traffic along Dole Street. As such, 50% of trips were assumed to travel to/from the west with the remaining 50% to travel to and from the east during the AM peak period while 53% were assumed to travel to/from the west and 47% were assumed to travel to/from the east during the PM peak period. Site-generated trips were routed to and from the project site based on their assumed origin/destination and turning restrictions at the project driveways. It should be noted that the trip distribution for this project varies from the distribution assumed for the adjacent developments since the trips associated with the UHM Multifamily development are expected to be primarily localized trips. In addition, the project site is generally equidistant to major roadways to the east and west of the project.

**B. Other Considerations**

**1. UHM 2019 Long Range Development Plan (LRDP) Update**

The University of Hawaii 2019 Long Range Development Plan Update outlines the capital improvement plans for the university within a 10-year



**UNIVERSITY OF HAWAII**  
**DESIGN-BUILD MULTIFAMILY MIXED-USE PROJECT**  
**DISTRIBUTION OF SITE-GENERATED VEHICLES**  
**WITH PROJECT**

**FIGURE**  
**5**

horizon. These improvements are expected to be implemented in two general phases and include the renovation of existing spaces, replacement of aging buildings with similar uses, consolidation of administrative offices, and construction of a new parking garage referred to as the Transportation Management Center (TMC). The majority of these improvements with the exception of TMC are intended to continue serving existing uses and as such are not expected to generate new trips in the project vicinity. The anticipated increases in traffic in the vicinity of the university are primarily expected to be a result of increases in student enrollment rather than directly from the proposed developments. Based on the “Traffic Impact Report for the University of Hawaii Long Range Development Plan” (hereafter referred to as the “LRDP TIR”) prepared in June 2020, the university expects enrollment to increase in the next five years without or with the LRDP improvements and thereafter, to remain generally static until year 2029. As such, the trips associated with the enrollment increases were incorporated into the projected conditions.

In addition, new trips in the project vicinity are also expected to result from the proposed TMC. The new facility is expected to provide 1,000 additional parking stalls to the university’s existing parking inventory along with accommodations for buses, shuttles, bikeshares, and carshares. Based on the LRDP TIR, the TMC is expected to generate 180 trips during the AM peak period and 310 trips during the PM peak period. The first phase of the LRDP is expected to be completed by Year 2024 with the second phase expected to be completed by Year 2029. The TMC is expected to be completed as part of Phase 1 and as such, the trips associated with the TMC were incorporated into the projected conditions.

## **2. Atherton Mixed-Use Student Housing Innovation and Entrepreneurship Center**

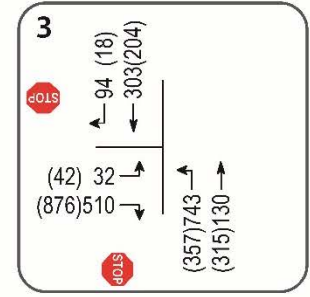
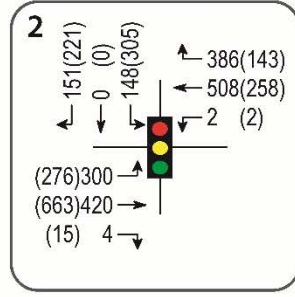
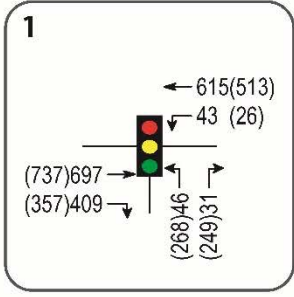
The “Atherton Mixed-Use Student Housing Innovation and Entrepreneurship Center” is the second P3 development initiated by UHM. Similar to the UHM Multifamily development, it also incorporated as an

element of the overall LRDP; however it is being addressed separately for the purpose of permitting and as such, is included as a separate development in the vicinity. The project site is located at the northwest corner of University Avenue and Metcalf Street and entails the redevelopment of the existing Charles Atherton and Mary Atherton Richards Houses into mixed-use development that includes residential, educational, and restaurant uses. As included in the “Traffic Impact Report for the Atherton Mixed-Use Student Housing Innovation and Entrepreneurship Center” dated February 2020, the proposed project is expected to generate 24 trips during the AM peak period and 41 trips during the PM peak period. Access to the proposed project is expected to be provided via driveways off Metcalf Street and University Avenue with the project expected to be completed by Year 2023. As such, for the purpose of this report, the trips associated with the Atherton Mixed-Use Student Housing Innovation and Entrepreneurship Center were incorporated into the projected Year 2025 conditions.

**C. Total Traffic Volumes Without Project**

The projected Year 2025 AM and PM peak period traffic volumes without the proposed UHM Multifamily development are shown in Figure 6 and summarized in Table 3. The analysis incorporates the trips associated with other developments in the project vicinity including the UHM LRDP and Atherton Mixed-Use Student Housing Innovation and Entrepreneurship Center. The existing levels of service are provided for comparison purposes. LOS calculations are included in Appendix D.





**UNIVERSITY OF HAWAII  
 DESIGN-BUILD MULTIFAMILY MIXED-USE PROJECT  
 YEAR 2025 PEAK HOURS OF TRAFFIC  
 WITHOUT PROJECT**

FIGURE  
6

**Table 3: Existing and Projected Year 2025 (Without Project) LOS  
Traffic Operating Conditions**

Intersection	Approach/ Critical Movement	AM		PM	
		Exist	Year 2025 w/out Proj	Exist	Year 2025 w/out Proj
Lower-Campus Rd/ Dole St	Eastbound	A	A	A	A
	Westbound	A	A	A	A
	Northbound	B	B	B	B
East-West Rd/ Dole St	Eastbound	A	A	B	B
	Westbound	B	B	C	C
	Southbound	B	C	B	B
St. Louis Dr/ Dole St	Eastbound	D	D	E	E
	Northbound (LT*)	B	B	A	A

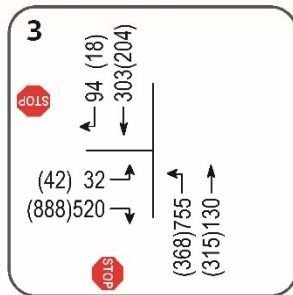
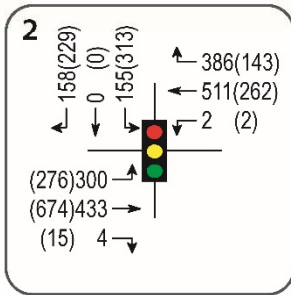
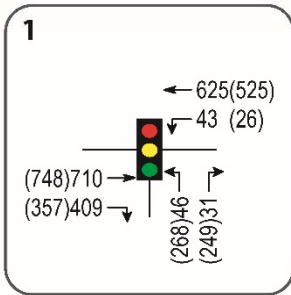
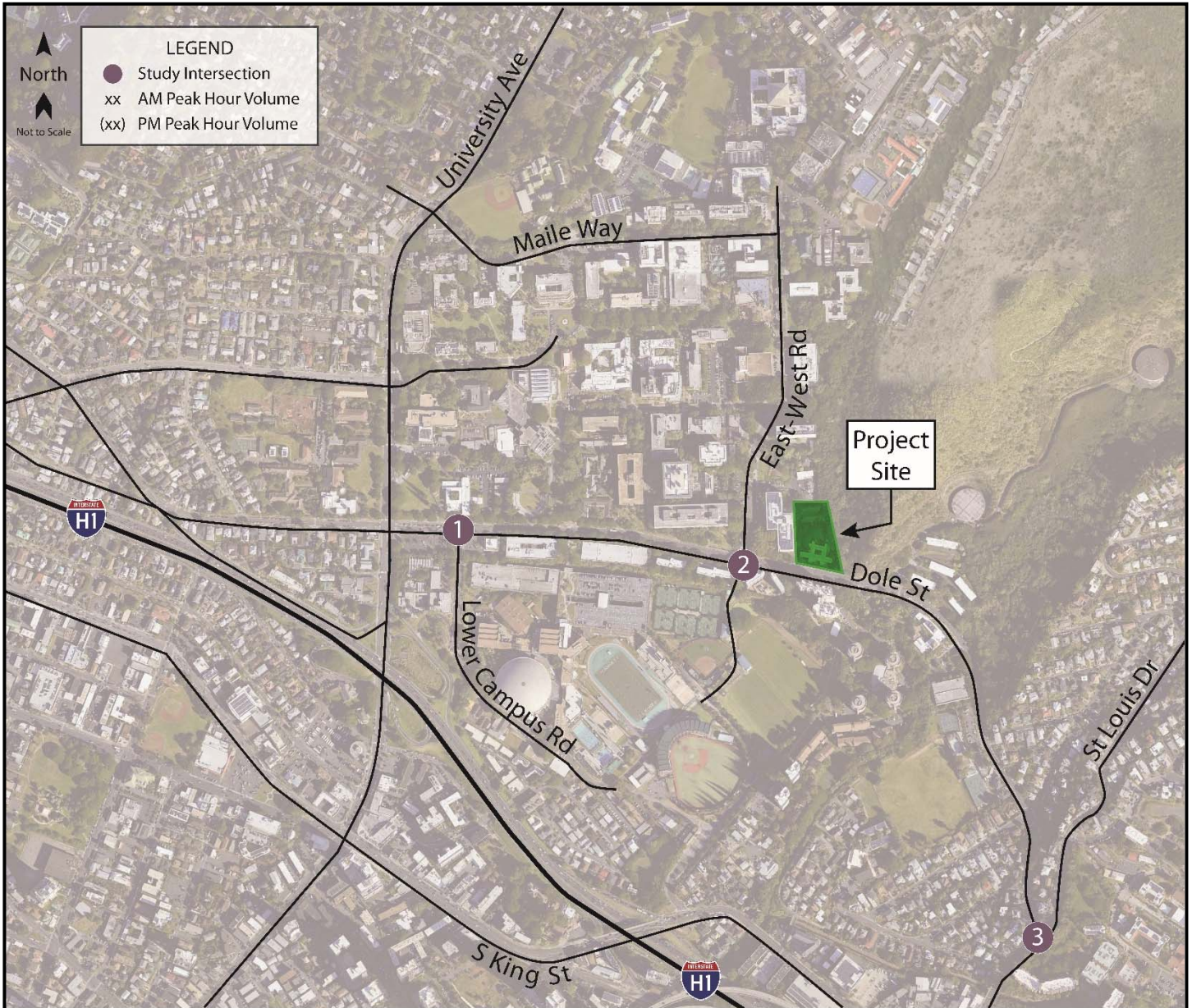
\*LT = Left-Turn

Under Year 2025 without project conditions, traffic operations in the vicinity are expected to remain generally similar to existing conditions. Along Dole Street, the approaches at the intersection with Lower-Campus Road are expected to continue operating at LOS “B” or better during both peak periods while those at the intersection of St. Louis Drive are expected to continue operating at LOS “D” and LOS “E” or better during the AM and PM peak periods, respectively. As previously discussed, traffic operations at this intersection are influenced by the high volume of right-turning vehicles from the stop-controlled approach. At East-West Road, traffic operations at that intersection are expected to continue operating at LOS “B” or better during the AM peak period but are expected to operate lower from an LOS “B” to an LOS “C” during the PM peak period as result of ambient growth in traffic in the project vicinity.

**D. Total Traffic Volumes With Project**

Figure 7 shows the Year 2025 cumulative AM and PM peak hour traffic conditions resulting from the projected external traffic and the proposed UHM Multifamily development. The cumulative volumes consist of site-generated traffic





**UNIVERSITY OF HAWAII**  
**DESIGN-BUILD MULTIFAMILY MIXED-USE PROJECT**  
**YEAR 2025 PEAK HOURS OF TRAFFIC**  
**WITH PROJECT**

**FIGURE**  
**7**

superimposed over Year 2025 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.

**V. TRAFFIC IMPACT ANALYSIS**

The Year 2025 cumulative AM and PM peak hour traffic conditions with the proposed UHM Multifamily development are summarized in Table 4. The existing and projected Year 2025 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix E.

**Table 4: Existing and Projected Year 2025 (Without and With Project) LOS Traffic Operating Conditions**

Intersection	Approach/ Critical Movement	AM			PM		
		Exist	Year 2025		Exist	Year 2025	
			w/out Proj	w/ Proj		w/out Proj	w/ Proj
Lower-Campus Rd/ Dole St	Eastbound	A	A	A	A	A	A
	Westbound	A	A	A	A	A	A
	Northbound	B	B	B	B	B	B
East-West Rd/ Dole St	Eastbound	A	A	A	B	B	B
	Westbound	B	B	B	C	C	C
	Southbound	B	C	C	B	B	B
St. Louis Dr/ Dole St	Eastbound	D	D	D	E	E	E
	Northbound (LT*)	B	B	B	A	A	A

\*LT = Left-Turn

Under Year 2025 with project conditions, traffic operations in the vicinity of the project are generally expected to remain similar to without project conditions. Along Dole Street, traffic operations at the intersection with Lower-Campus Road are expected to continue operating at LOS “B” or better during both peak periods while those at the intersection with East-West Road are expected to continue operating at LOS “B” or better during the AM peak period and LOS “C” or better being the PM peak period. The remaining intersection at St. Louis Drive is also expected to continue operating similar to without project conditions.



## **VI. MULTIMODAL FACILITIES**

### **A. Pedestrian Facilities**

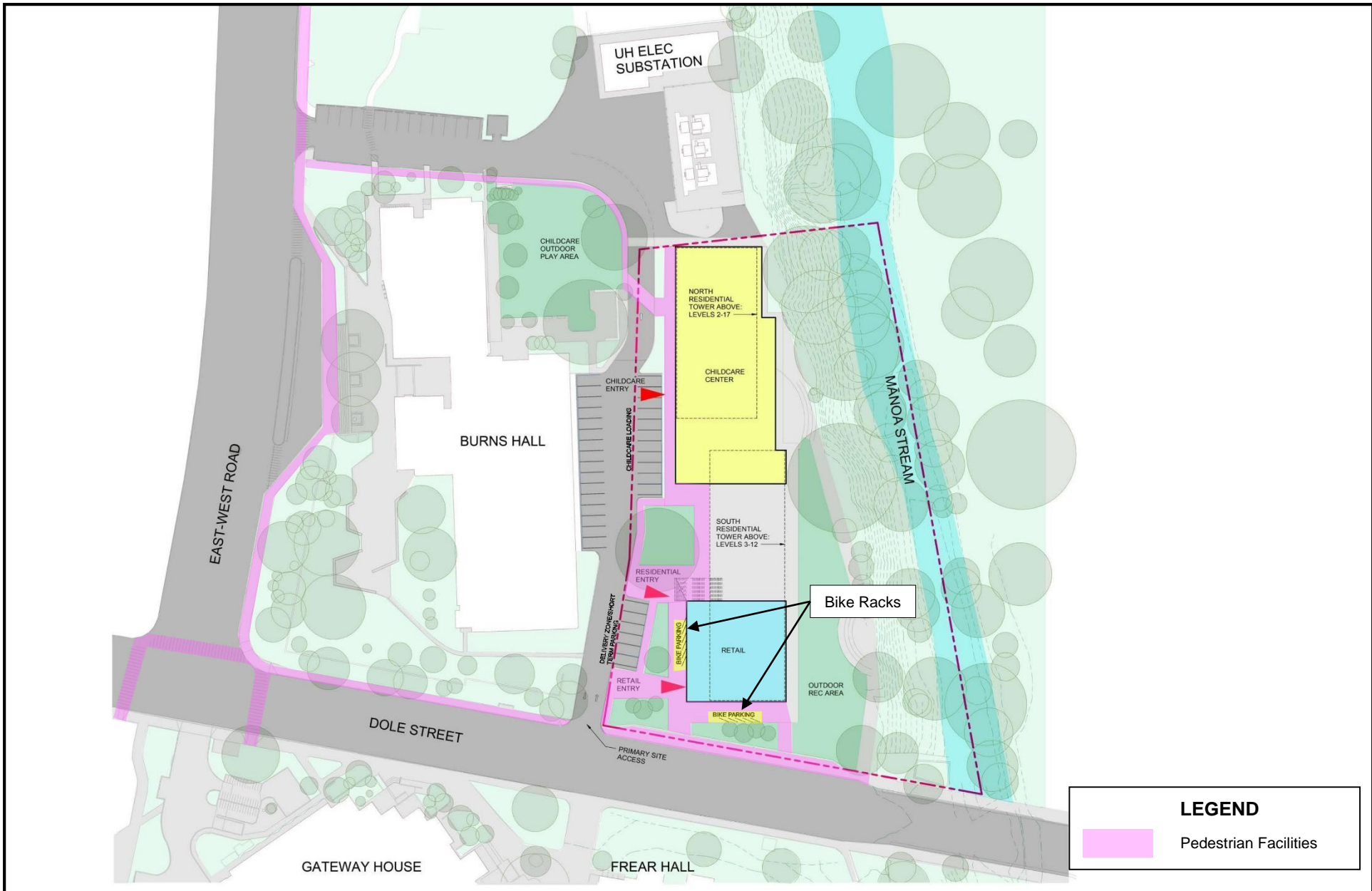
There is a network of pedestrian facilities provided in the vicinity of the project given its relative location to the UHM campus. These facilities are generally comprised of improved sidewalks, crosswalks, pedestrian signal phases, and curb ramps. In addition, there is a signalized midblock crossing located between Lower Campus Road and East-West Road along Dole Street to facilitate pedestrian crossings between the university parking garage and a pedestrian pathway referred to as the “Legacy Path.” Street lighting and trees that provide intermittent shade also enhance the overall pedestrian environment.

With the proposed project, access to and from the university campus is expected to continue being provided via sidewalks along Dole Street and East-West Road. The proposed pedestrian connections to/from the project site are shown on Figure 8.

### **B. Bicycle Facilities**

The project site is located in close proximity to a number of BIKI bike share stations which are located within the University of Hawaii campus. The nearest bike share facility is located south of Dole Street in the vicinity of university campus housing. There are also additional bike share stations located west of the project site along Dole Street, near the University’s parking structure as well as north of the project site towards the center of campus (see Figure 9). However, existing bike facilities along the roadways in the vicinity of the project are currently limited to bike lanes along a segment of Dole Street between University Avenue and East-West Road. East of East-West Road, Dole Street transitions to a shared roadway.

The proposed project is expected to provide on-site bicycle facilities to encourage the use alternate modes of transportation (see Figure 8). Bike racks for short-term parking will be provided near the south end of the project site while long-term parking will be provided on the 2nd level of the development. Additional improvements are also planned by the City and County of Honolulu to enhance bicycle facilities in the project vicinity. According to the 2019 Update of the Oahu

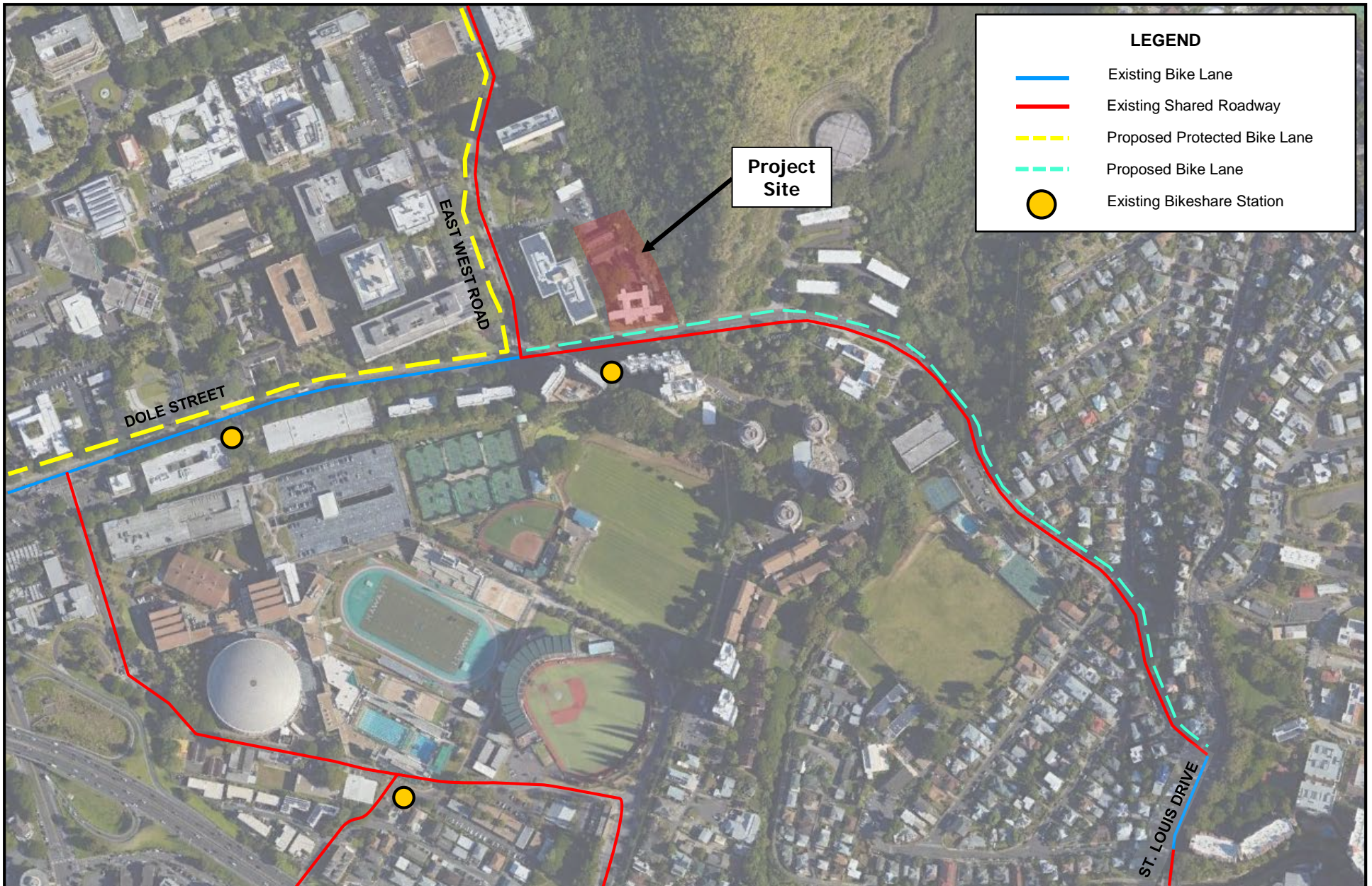


UNIVERSITY OF HAWAII DESIGN-BUILD MULTIFAMILY MIXED-USE PROJECT

ON-SITE MULTIMODAL FACILITIES

FIGURE  
8





UNIVERSITY OF HAWAII DESIGN-BUILD MULTIFAMILY MIXED-USE PROJECT

BICYCLE FACILITIES

FIGURE

9

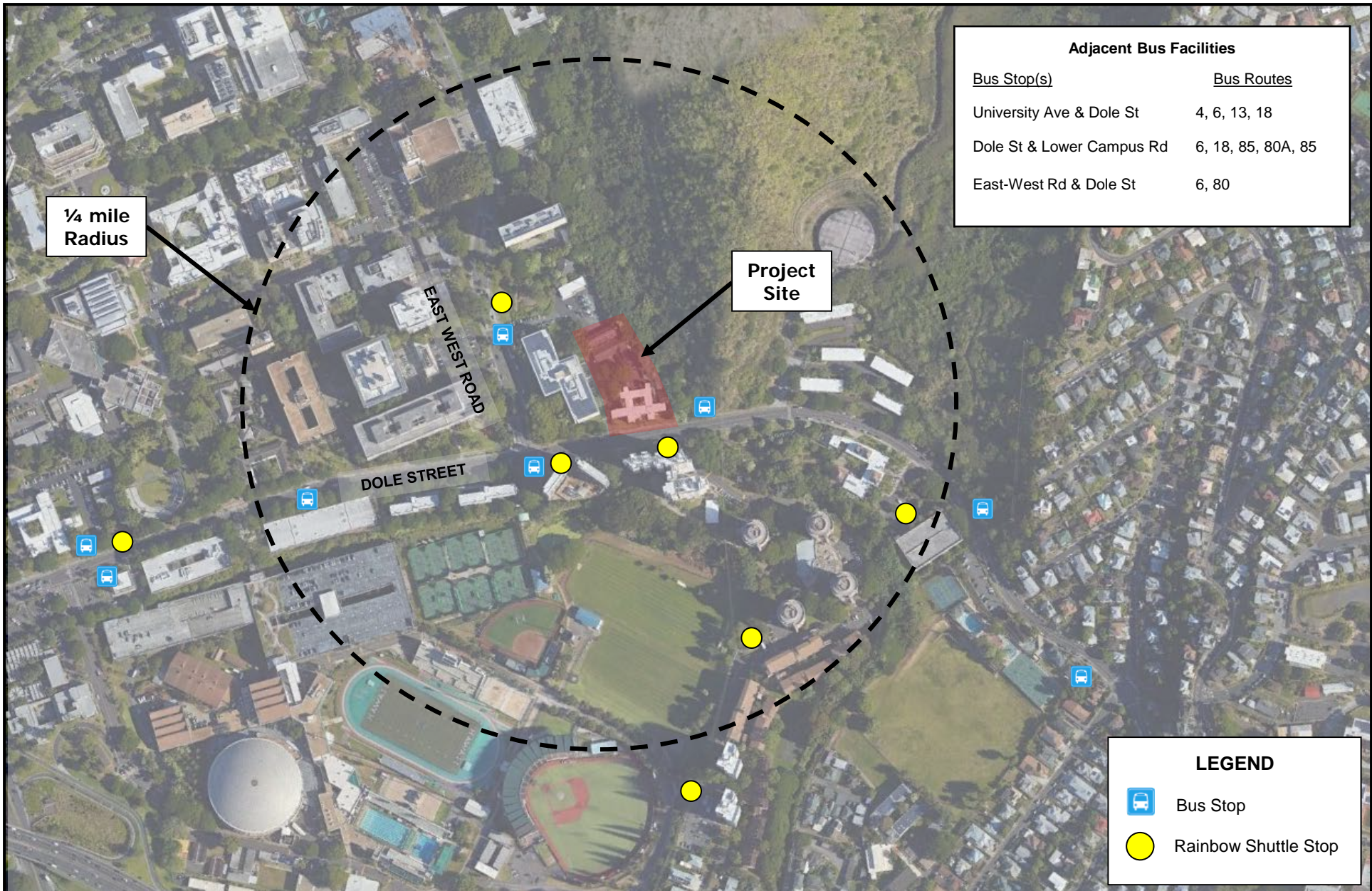
Bike Plan published by the City and County of Honolulu Department of Transportation Services, there are plans to convert the existing bike lanes along Dole Street to protected bike lanes and to provide bike lanes along Dole Street east of East-West Road. In addition, protected bike lanes are also planned along East-West Road and Maile Way through the university campus. These improvements are depicted in Figure 9.

**C. Transit Facilities**

There is a number of existing transit resources located within the project vicinity given the project's proximity to the university campus. These facilities are provided by "The Bus," which is operated by the Oahu Transit Service (OTS) for the City and County of Honolulu Department of Transportation Services. Within a quarter mile radius of the project, there are a total of 4 bus stop locations serving a total of 11 unique routes (see Figure 10). In addition, the University of Hawaii provides a free shuttle service referred to as the "Rainbow Shuttle." This service provides connections to various areas within the university campus as well as to neighboring areas such as Moilili and Koko Head Avenue. There are 6 shuttle routes that operate daily Mondays through Fridays generally from 7:00 AM to 6:00 PM. A night shuttle is also offered between 5:00 PM and 11:15 PM daily. A number of shuttle stops may be accessed from the project site (see Figure 10).

Access to transit facilities in the project vicinity is expected to improve under with project conditions. The new Transportation Management Center included in the UHM LRDP is expected to provide additional parking for the university as well as designated areas for shuttles and buses and is expected to serve as a hub for transit in the vicinity.





UNIVERSITY OF HAWAII DESIGN-BUILD MULTIFAMILY MIXED-USE PROJECT

TRANSIT FACILITIES

FIGURE

10

## **VII. RECOMMENDATIONS**

Based on the analysis of the traffic data, the following are the recommendations of this study to be incorporated in the project design.

1. Maintain sufficient sight distance for motorists to safely enter and exit the project driveways to enhance pedestrians, bicyclists, and motorists awareness at conflict points.
2. Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.
3. Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto public roadways.
4. Provide sufficient turning radii at all project driveways to avoid or minimize vehicle encroachments to oncoming traffic lanes.
5. Provide adequate signage to clearly indicate the designated uses for the provided parking stalls. Stalls are expected to be allocated for the day care and restaurant uses with short-term loading/unloading stalls provided for the residential uses.
6. Given the limited number of parking stalls, monitor the parking area to prevent long-term parking where it is prohibited and to minimize potential conflicts between the different uses.
7. Provide convenient access to the bicycle parking facilities located on the second level of the building. In addition, monitor the bicycle parking areas on the ground level to ensure adequate available parking to meet demand.
8. Coordinate with the City and County of Honolulu Department of Transportation Services regarding their plans for additional bike facilities along Dole Street and East-West Road.
9. Prepare a Transportation Management Plan for the project since access and circulation for the various uses are expected to differ. This plan may be incorporated into an overall Transportation Management Plan for the University of Hawaii at Manoa campus, if appropriate.
10. Prepare a Construction Management Plan (CMP) for the project that includes discussion on construction activities associated with the anticipated construction schedule and phasing, as well operational conditions associated with traffic circulation, traffic control, and parking during the construction period.

## **VIII. CONCLUSION**

The proposed project entails the redevelopment of the former NOAA building to include residential, commercial, and child care uses. With the implementation of the aforementioned recommendations, traffic operations in the vicinity are generally expected to remain similar to without project conditions. Although traffic operations are generally expected to remain similar to without project conditions, access to the project site and circulation for the various uses are expected to differ and as such, the preparation of a Transportation Management Plan is recommended. This plan may be incorporated into an overall Transportation Management Plan for the University of Hawaii at Manoa as the UHM Multifamily development is one element of the long-term improvements planned for the university. In addition, given the high volume of pedestrian and vehicular traffic in the project vicinity, the preparation of a Construction Management Plan which includes discussions on the anticipated construction schedule, phasing, as well as traffic circulation, traffic control and parking during construction is recommended to further minimize the potential impact of the proposed project on the surrounding roadway network.

---

**APPENDIX A**  
**EXISTING TRAFFIC COUNT DATA**

---



# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400  
Honolulu HI, 96826

Counted By: TN, WL  
Counters: D4-5677, D4-5675  
Weather: CLEAR

File Name : DOL LOW WEEKDAY AM  
Site Code : 00000005  
Start Date : 4/18/2019  
Page No : 1

Groups Printed- Unshifted

Start Time	Dole Street Westbound				Lower Campus Road Northbound				Dole Street Eastbound			Int. Total
	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	App. Total	
06:00 AM	4	26	4	34	5	2	1	8	34	59	93	135
06:15 AM	11	30	4	45	6	2	2	10	62	70	132	187
06:30 AM	6	63	13	82	3	1	1	5	60	111	171	258
06:45 AM	5	100	15	120	5	6	5	16	96	100	196	332
<b>Total</b>	<b>26</b>	<b>219</b>	<b>36</b>	<b>281</b>	<b>19</b>	<b>11</b>	<b>9</b>	<b>39</b>	<b>252</b>	<b>340</b>	<b>592</b>	<b>912</b>
07:00 AM	8	161	31	200	11	9	2	22	128	99	227	449
07:15 AM	9	140	20	169	20	6	5	31	152	98	250	450
07:30 AM	15	152	43	210	3	5	7	15	208	99	307	532
07:45 AM	11	152	29	192	8	11	6	25	163	99	262	479
<b>Total</b>	<b>43</b>	<b>605</b>	<b>123</b>	<b>771</b>	<b>42</b>	<b>31</b>	<b>20</b>	<b>93</b>	<b>651</b>	<b>395</b>	<b>1046</b>	<b>1910</b>
08:00 AM	17	120	36	173	12	2	14	28	122	115	237	438
08:15 AM	24	106	47	177	15	13	15	43	126	142	268	488
08:30 AM	22	103	35	160	16	12	15	43	143	151	294	497
08:45 AM	17	112	36	165	24	17	16	57	164	139	303	525
<b>Total</b>	<b>80</b>	<b>441</b>	<b>154</b>	<b>675</b>	<b>67</b>	<b>44</b>	<b>60</b>	<b>171</b>	<b>555</b>	<b>547</b>	<b>1102</b>	<b>1948</b>
<b>Grand Total</b>	<b>149</b>	<b>1265</b>	<b>313</b>	<b>1727</b>	<b>128</b>	<b>86</b>	<b>89</b>	<b>303</b>	<b>1458</b>	<b>1282</b>	<b>2740</b>	<b>4770</b>
Apprch %	8.6	73.2	18.1		42.2	28.4	29.4		53.2	46.8		
Total %	3.1	26.5	6.6	36.2	2.7	1.8	1.9	6.4	30.6	26.9	57.4	

Start Time	Dole Street Westbound			Lower Campus Road Northbound			Dole Street Eastbound			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	8	161	169	11	9	20	128	99	227	416
07:15 AM	9	140	149	20	6	26	152	98	250	425
07:30 AM	15	152	167	3	5	8	208	99	307	482
07:45 AM	11	152	163	8	11	19	163	99	262	444
<b>Total Volume</b>	<b>43</b>	<b>605</b>	<b>648</b>	<b>42</b>	<b>31</b>	<b>73</b>	<b>651</b>	<b>395</b>	<b>1046</b>	<b>1767</b>
<b>% App. Total</b>	<b>6.6</b>	<b>93.4</b>		<b>57.5</b>	<b>42.5</b>		<b>62.2</b>	<b>37.8</b>		
PHF	.717	.939	.959	.525	.705	.702	.782	.997	.852	.916

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400  
Honolulu HI, 96826

Counted By: TN, WL  
Counters: D4-5677, D4-5675  
Weather: CLEAR

File Name : DOL LOW WEEKDAY PM  
Site Code : 00000005  
Start Date : 4/18/2019  
Page No : 1

Groups Printed- Unshifted

Start Time	Dole Street Westbound				Lower Campus Road Northbound				Dole Street Eastbound			Int. Total
	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	App. Total	
03:00 PM	8	105	55	168	39	71	27	137	137	43	180	485
03:15 PM	7	123	23	153	40	63	20	123	159	45	204	480
03:30 PM	9	93	28	130	53	45	11	109	142	57	199	438
03:45 PM	6	90	20	116	64	42	28	134	180	48	228	478
<b>Total</b>	<b>30</b>	<b>411</b>	<b>126</b>	<b>567</b>	<b>196</b>	<b>221</b>	<b>86</b>	<b>503</b>	<b>618</b>	<b>193</b>	<b>811</b>	<b>1881</b>
04:00 PM	9	93	31	133	54	46	22	122	165	45	210	465
04:15 PM	7	113	28	148	61	60	26	147	193	74	267	562
04:30 PM	10	117	51	178	49	71	25	145	148	94	242	565
04:45 PM	4	106	24	134	89	65	16	170	171	99	270	574
<b>Total</b>	<b>30</b>	<b>429</b>	<b>134</b>	<b>593</b>	<b>253</b>	<b>242</b>	<b>89</b>	<b>584</b>	<b>677</b>	<b>312</b>	<b>989</b>	<b>2166</b>
05:00 PM	5	106	43	154	56	53	28	137	185	84	269	560
05:15 PM	5	115	19	139	50	29	16	95	166	102	268	502
05:30 PM	12	116	30	158	62	41	19	122	150	98	248	528
05:45 PM	8	98	26	132	55	39	31	125	170	124	294	551
<b>Total</b>	<b>30</b>	<b>435</b>	<b>118</b>	<b>583</b>	<b>223</b>	<b>162</b>	<b>94</b>	<b>479</b>	<b>671</b>	<b>408</b>	<b>1079</b>	<b>2141</b>
<b>Grand Total</b>	<b>90</b>	<b>1275</b>	<b>378</b>	<b>1743</b>	<b>672</b>	<b>625</b>	<b>269</b>	<b>1566</b>	<b>1966</b>	<b>913</b>	<b>2879</b>	<b>6188</b>
Apprch %	5.2	73.1	21.7		42.9	39.9	17.2		68.3	31.7		
Total %	1.5	20.6	6.1	28.2	10.9	10.1	4.3	25.3	31.8	14.8	46.5	

Start Time	Dole Street Westbound			Lower Campus Road Northbound			Dole Street Eastbound			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	7	113	120	61	60	121	193	74	267	508
04:30 PM	10	117	127	49	71	120	148	94	242	489
04:45 PM	4	106	110	89	65	154	171	99	270	534
05:00 PM	5	106	111	56	53	109	185	84	269	489
<b>Total Volume</b>	<b>26</b>	<b>442</b>	<b>468</b>	<b>255</b>	<b>249</b>	<b>504</b>	<b>697</b>	<b>351</b>	<b>1048</b>	<b>2020</b>
<b>% App. Total</b>	<b>5.6</b>	<b>94.4</b>		<b>50.6</b>	<b>49.4</b>		<b>66.5</b>	<b>33.5</b>		
PHF	.650	.944	.921	.716	.877	.818	.903	.886	.970	.946

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400  
Honolulu HI, 96826

Counted By: SS, MA  
Counters: TU-2049, TU-1958  
Weather: CLEAR

File Name : DOL EAS WEEKDAY AM  
Site Code : 00000003  
Start Date : 4/16/2019  
Page No : 1

### Groups Printed- Unshifted

Start Time	East West Rd Southbound					Dole St Westbound					Driveway Northbound					Dole St Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
06:00 AM	6	0	4	4	14	0	21	12	1	34	2	0	2	0	4	15	15	2	2	34	86
06:15 AM	5	0	22	3	30	2	39	15	4	60	0	0	2	0	2	36	24	0	0	60	152
06:30 AM	15	0	13	1	29	1	51	41	3	96	0	0	2	0	2	39	32	2	6	79	206
06:45 AM	14	0	13	3	30	0	88	68	7	163	0	0	1	0	1	39	44	0	11	94	288
<b>Total</b>	<b>40</b>	<b>0</b>	<b>52</b>	<b>11</b>	<b>103</b>	<b>3</b>	<b>199</b>	<b>136</b>	<b>15</b>	<b>353</b>	<b>2</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>9</b>	<b>129</b>	<b>115</b>	<b>4</b>	<b>19</b>	<b>267</b>	<b>732</b>
07:00 AM	24	0	33	4	61	1	153	96	9	259	1	0	1	1	3	46	82	1	14	143	466
07:15 AM	39	0	28	6	73	0	121	100	15	236	1	0	0	0	1	63	88	1	29	181	491
07:30 AM	43	1	41	4	89	0	107	82	5	194	1	1	1	1	4	75	127	2	25	229	516
07:45 AM	35	1	39	6	81	1	127	72	16	216	0	1	1	2	4	70	123	0	36	229	530
<b>Total</b>	<b>141</b>	<b>2</b>	<b>141</b>	<b>20</b>	<b>304</b>	<b>2</b>	<b>508</b>	<b>350</b>	<b>45</b>	<b>905</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>12</b>	<b>254</b>	<b>420</b>	<b>4</b>	<b>104</b>	<b>782</b>	<b>2003</b>
08:00 AM	23	0	30	4	57	2	125	73	21	221	1	0	0	0	1	45	95	2	39	181	460
08:15 AM	29	0	35	9	73	1	86	61	19	167	3	0	1	0	4	57	94	1	61	213	457
08:30 AM	38	0	42	23	103	0	78	68	47	193	2	0	0	0	2	69	62	0	154	285	583
08:45 AM	33	1	51	29	114	1	75	87	85	248	1	1	0	2	4	71	65	0	282	418	784
<b>Total</b>	<b>123</b>	<b>1</b>	<b>158</b>	<b>65</b>	<b>347</b>	<b>4</b>	<b>364</b>	<b>289</b>	<b>172</b>	<b>829</b>	<b>7</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>11</b>	<b>242</b>	<b>316</b>	<b>3</b>	<b>536</b>	<b>1097</b>	<b>2284</b>
<b>Grand Total</b>	<b>304</b>	<b>3</b>	<b>351</b>	<b>96</b>	<b>754</b>	<b>9</b>	<b>1071</b>	<b>775</b>	<b>232</b>	<b>2087</b>	<b>12</b>	<b>3</b>	<b>11</b>	<b>6</b>	<b>32</b>	<b>625</b>	<b>851</b>	<b>11</b>	<b>659</b>	<b>2146</b>	<b>5019</b>
Apprch %	40.3	0.4	46.6	12.7		0.4	51.3	37.1	11.1		37.5	9.4	34.4	18.8		29.1	39.7	0.5	30.7		
Total %	6.1	0.1	7	1.9	15	0.2	21.3	15.4	4.6	41.6	0.2	0.1	0.2	0.1	0.6	12.5	17	0.2	13.1	42.8	

Start Time	East West Rd Southbound				Dole St Westbound				Driveway Northbound				Dole St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	24	0	33	57	1	153	96	250	1	0	1	2	46	82	1	129	438
07:15 AM	39	0	28	67	0	121	100	221	1	0	0	1	63	88	1	152	441
07:30 AM	43	1	41	85	0	107	82	189	1	1	1	3	75	127	2	204	481
07:45 AM	35	1	39	75	1	127	72	200	0	1	1	2	70	123	0	193	470
<b>Total Volume</b>	<b>141</b>	<b>2</b>	<b>141</b>	<b>284</b>	<b>2</b>	<b>508</b>	<b>350</b>	<b>860</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>8</b>	<b>254</b>	<b>420</b>	<b>4</b>	<b>678</b>	<b>1830</b>
<b>% App. Total</b>	<b>49.6</b>	<b>0.7</b>	<b>49.6</b>		<b>0.2</b>	<b>59.1</b>	<b>40.7</b>		<b>37.5</b>	<b>25</b>	<b>37.5</b>		<b>37.5</b>	<b>61.9</b>	<b>0.6</b>		
PHF	.820	.500	.860	.835	.500	.830	.875	.860	.750	.500	.750	.667	.847	.827	.500	.831	.951

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400  
Honolulu HI, 96826

Counted By: DY, SS  
Counters: TU-1958, TU-2049  
Weather: CLEAR

File Name : DOL EAS WEEKDAY PM  
Site Code : 00000003  
Start Date : 4/16/2019  
Page No : 1

### Groups Printed- Unshifted

Start Time	East West Rd Southbound					Dole St Westbound					Driveway Northbound					Dole St Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
03:00 PM	63	2	41	8	114	2	50	30	17	99	1	1	4	5	11	55	134	1	68	258	482
03:15 PM	74	0	39	2	115	0	64	26	23	113	1	0	1	0	2	56	138	1	56	251	481
03:30 PM	64	0	30	5	99	2	57	37	9	105	2	0	2	2	6	36	139	3	51	229	439
03:45 PM	58	0	28	1	87	2	56	13	14	85	1	0	1	5	7	50	134	0	47	231	410
<b>Total</b>	<b>259</b>	<b>2</b>	<b>138</b>	<b>16</b>	<b>415</b>	<b>6</b>	<b>227</b>	<b>106</b>	<b>63</b>	<b>402</b>	<b>5</b>	<b>1</b>	<b>8</b>	<b>12</b>	<b>26</b>	<b>197</b>	<b>545</b>	<b>5</b>	<b>222</b>	<b>969</b>	<b>1812</b>
04:00 PM	53	1	34	3	91	1	69	32	23	125	2	0	1	2	5	51	141	1	86	279	500
04:15 PM	63	0	26	9	98	0	67	36	15	118	2	0	1	4	7	67	167	5	103	342	565
04:30 PM	74	0	46	7	127	0	53	26	29	108	3	0	2	1	6	69	174	4	66	313	554
04:45 PM	72	2	32	3	109	0	60	24	24	108	2	0	1	2	5	64	158	3	67	292	514
<b>Total</b>	<b>262</b>	<b>3</b>	<b>138</b>	<b>22</b>	<b>425</b>	<b>1</b>	<b>249</b>	<b>118</b>	<b>91</b>	<b>459</b>	<b>9</b>	<b>0</b>	<b>5</b>	<b>9</b>	<b>23</b>	<b>251</b>	<b>640</b>	<b>13</b>	<b>322</b>	<b>1226</b>	<b>2133</b>
05:00 PM	56	1	46	2	105	2	78	28	31	139	3	0	4	1	8	36	164	3	49	252	504
05:15 PM	58	1	29	3	91	0	55	29	37	121	1	0	0	4	5	42	148	0	58	248	465
05:30 PM	66	0	52	3	121	1	49	29	29	108	1	0	0	3	4	39	151	1	66	257	490
05:45 PM	55	1	29	10	95	0	62	21	20	103	3	1	2	2	8	45	136	2	54	237	443
<b>Total</b>	<b>235</b>	<b>3</b>	<b>156</b>	<b>18</b>	<b>412</b>	<b>3</b>	<b>244</b>	<b>107</b>	<b>117</b>	<b>471</b>	<b>8</b>	<b>1</b>	<b>6</b>	<b>10</b>	<b>25</b>	<b>162</b>	<b>599</b>	<b>6</b>	<b>227</b>	<b>994</b>	<b>1902</b>
<b>Grand Total</b>	<b>756</b>	<b>8</b>	<b>432</b>	<b>56</b>	<b>1252</b>	<b>10</b>	<b>720</b>	<b>331</b>	<b>271</b>	<b>1332</b>	<b>22</b>	<b>2</b>	<b>19</b>	<b>31</b>	<b>74</b>	<b>610</b>	<b>1784</b>	<b>24</b>	<b>771</b>	<b>3189</b>	<b>5847</b>
Apprch %	60.4	0.6	34.5	4.5		0.8	54.1	24.8	20.3		29.7	2.7	25.7	41.9		19.1	55.9	0.8	24.2		
Total %	12.9	0.1	7.4	1	21.4	0.2	12.3	5.7	4.6	22.8	0.4	0	0.3	0.5	1.3	10.4	30.5	0.4	13.2	54.5	

Start Time	East West Rd Southbound				Dole St Westbound				Driveway Northbound				Dole St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	63	0	26	89	0	67	<b>36</b>	103	2	0	1	3	67	167	<b>5</b>	239	434
04:30 PM	<b>74</b>	<b>0</b>	<b>46</b>	<b>120</b>	0	53	26	79	<b>3</b>	0	2	5	<b>69</b>	<b>174</b>	<b>4</b>	<b>247</b>	<b>451</b>
04:45 PM	72	<b>2</b>	32	106	0	60	24	84	2	0	1	3	64	158	3	225	418
05:00 PM	56	1	46	103	<b>2</b>	<b>78</b>	28	<b>108</b>	3	0	<b>4</b>	<b>7</b>	36	164	3	203	421
Total Volume	265	3	150	418	2	258	114	374	10	0	8	18	236	663	15	914	1724
% App. Total	63.4	0.7	35.9		0.5	69	30.5		55.6	0	44.4		25.8	72.5	1.6		
PHF	.895	.375	.815	.871	.250	.827	.792	.866	.833	.000	.500	.643	.855	.953	.750	.925	.956



# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400  
Honolulu HI, 96826

Counted By: WL, AN  
Counters: TU-1957, TU-0652  
Weather: CLEAR

File Name : DOL LOU WEEKDAY AM  
Site Code : 00000002  
Start Date : 4/16/2019  
Page No : 1

### Groups Printed- Unshifted

Start Time	St Louis Drive Southbound			St Louis Drive Northbound				Dole Street Eastbound			Int. Total	
	Thru	Right	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds		App. Total
06:00 AM	34	2	36	26	13	2	41	0	23	1	24	101
06:15 AM	41	2	43	51	15	2	68	1	33	1	35	146
06:30 AM	63	5	68	94	23	0	117	3	50	0	53	238
06:45 AM	67	9	76	166	26	1	193	2	53	2	57	326
<b>Total</b>	<b>205</b>	<b>18</b>	<b>223</b>	<b>337</b>	<b>77</b>	<b>5</b>	<b>419</b>	<b>6</b>	<b>159</b>	<b>4</b>	<b>169</b>	<b>811</b>
07:00 AM	80	29	109	201	35	4	240	8	102	1	111	460
07:15 AM	82	18	100	179	35	4	218	5	111	2	118	436
07:30 AM	75	21	96	157	33	15	205	12	155	15	182	483
07:45 AM	66	26	92	170	27	7	204	7	135	0	142	438
<b>Total</b>	<b>303</b>	<b>94</b>	<b>397</b>	<b>707</b>	<b>130</b>	<b>30</b>	<b>867</b>	<b>32</b>	<b>503</b>	<b>18</b>	<b>553</b>	<b>1817</b>
08:00 AM	52	14	66	153	30	0	183	14	86	0	100	349
08:15 AM	65	15	80	133	32	2	167	11	83	1	95	342
08:30 AM	72	14	86	129	38	4	171	5	82	0	87	344
08:45 AM	54	14	68	134	30	5	169	7	84	0	91	328
<b>Total</b>	<b>243</b>	<b>57</b>	<b>300</b>	<b>549</b>	<b>130</b>	<b>11</b>	<b>690</b>	<b>37</b>	<b>335</b>	<b>1</b>	<b>373</b>	<b>1363</b>
<b>Grand Total</b>	<b>751</b>	<b>169</b>	<b>920</b>	<b>1593</b>	<b>337</b>	<b>46</b>	<b>1976</b>	<b>75</b>	<b>997</b>	<b>23</b>	<b>1095</b>	<b>3991</b>
Apprch %	81.6	18.4		80.6	17.1	2.3		6.8	91.1	2.1		
Total %	18.8	4.2	23.1	39.9	8.4	1.2	49.5	1.9	25	0.6	27.4	

Start Time	St Louis Drive Southbound			St Louis Drive Northbound			Dole Street Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	80	29	109	201	35	236	8	102	110	455
07:15 AM	82	18	100	179	35	214	5	111	116	430
07:30 AM	75	21	96	157	33	190	12	155	167	453
07:45 AM	66	26	92	170	27	197	7	135	142	431
<b>Total Volume</b>	<b>303</b>	<b>94</b>	<b>397</b>	<b>707</b>	<b>130</b>	<b>837</b>	<b>32</b>	<b>503</b>	<b>535</b>	<b>1769</b>
% App. Total	76.3	23.7		84.5	15.5		6	94		
PHF	.924	.810	.911	.879	.929	.887	.667	.811	.801	.972

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400  
Honolulu HI, 96826

Counted By: WL, AN  
Counters: TU-1957, TU-0652  
Weather: CLEAR

File Name : DOL LOU WEEKDAY PM  
Site Code : 00000002  
Start Date : 4/16/2019  
Page No : 1

Groups Printed- Unshifted

Start Time	St Louis Drive Southbound			St Louis Drive Northbound				Dole Street Eastbound			Int. Total	
	Thru	Right	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds		App. Total
03:00 PM	43	3	46	72	56	4	132	5	220	2	227	405
03:15 PM	53	6	59	79	53	5	137	9	195	3	207	403
03:30 PM	46	9	55	70	47	6	123	20	187	1	208	386
03:45 PM	53	3	56	80	87	6	173	15	199	2	216	445
Total	195	21	216	301	243	21	565	49	801	8	858	1639
04:00 PM	45	8	53	88	73	2	163	11	173	1	185	401
04:15 PM	35	5	40	80	76	4	160	10	189	1	200	400
04:30 PM	39	3	42	78	73	2	153	10	236	0	246	441
04:45 PM	47	1	48	84	73	2	159	11	230	1	242	449
Total	166	17	183	330	295	10	635	42	828	3	873	1691
05:00 PM	50	10	60	86	72	9	167	12	195	1	208	435
05:15 PM	68	4	72	80	97	4	181	9	175	2	186	439
05:30 PM	61	8	69	66	84	4	154	6	202	0	208	431
05:45 PM	52	5	57	81	71	2	154	11	191	2	204	415
Total	231	27	258	313	324	19	656	38	763	5	806	1720
Grand Total	592	65	657	944	862	50	1856	129	2392	16	2537	5050
Apprch %	90.1	9.9		50.9	46.4	2.7		5.1	94.3	0.6		
Total %	11.7	1.3	13	18.7	17.1	1	36.8	2.6	47.4	0.3	50.2	

Start Time	St Louis Drive Southbound			St Louis Drive Northbound			Dole Street Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	39	3	42	78	73	151	10	236	246	439
04:45 PM	47	1	48	84	73	157	11	230	241	446
05:00 PM	50	10	60	86	72	158	12	195	207	425
05:15 PM	68	4	72	80	97	177	9	175	184	433
Total Volume	204	18	222	328	315	643	42	836	878	1743
% App. Total	91.9	8.1		51	49		4.8	95.2		
PHF	.750	.450	.771	.953	.812	.908	.875	.886	.892	.977

---

**APPENDIX B**

**LEVEL OF SERVICE DEFINITIONS**

---

## LEVEL OF SERVICE DEFINITIONS

### LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

**Level of Service (LOS)** for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically a 15-min analysis period. The criteria are given in the following table.

**Table 1: Level-of-Service Criteria for Signalized Intersections**

Level of Service	Control Delay per Vehicle (sec/veh)
A	$\leq 10.0$
B	$>10.0$ and $\leq 20.0$
C	$>20.0$ and $\leq 35.0$
D	$>35.0$ and $\leq 55.0$
E	$>55.0$ and $\leq 80.0$
F	$>80.0$

Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group.

**Level of Service A** describes operations with low control delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.

**Level of Service B** describes operations with control delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.

**Level of Service C** describes operations with control delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

**Level of Service D** describes operations with control delay greater than 35 and up to 55 sec per vehicle. At level of service 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.



**Level of Service E** describes operation with control delay greater than 55 and up to 80 sec per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.

**Level of Service F** describes operations with control delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

## LEVEL OF SERVICE DEFINITIONS

### LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

**Level of Service (LOS)** criteria are given in Table 1. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. If the degree of saturation is greater than about 0.9, average control delay is significantly affected by the length of the analysis period.

**Table 1: Level-of-Service Criteria for  
Unsignalized Intersections**

<b>Level of Service</b>	<b>Average Control Delay (Sec/Veh)</b>
A	$\leq 10.0$
B	$>10.0$ and $\leq 15.0$
C	$>15.0$ and $\leq 25.0$
D	$>25.0$ and $\leq 35.0$
E	$>35.0$ and $\leq 50.0$
F	$>50.0$

---

**APPENDIX C**

**CAPACITY ANALYSIS CALCULATIONS**  
**EXISTING PEAK PERIOD TRAFFIC ANALYSIS**

---

# HCM Signalized Intersection Capacity Analysis

## 1: Lower-Campus Road & Dole St

06/15/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑	↑
Traffic Volume (vph)	651	395	43	605	42	31
Future Volume (vph)	651	395	43	605	42	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	0.95	1.00		0.95	1.00	1.00
Frbp, ped/bikes	1.00	0.97		1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3539	1539		3527	1770	1435
Flt Permitted	1.00	1.00		0.88	0.95	1.00
Satd. Flow (perm)	3539	1539		3126	1770	1435
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	708	429	47	658	46	34
RTOR Reduction (vph)	0	145	0	0	0	29
Lane Group Flow (vph)	708	284	0	705	46	5
Confl. Peds. (#/hr)		20	10			123
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	32.9	32.9		32.9	7.8	7.8
Effective Green, g (s)	32.9	32.9		32.9	7.8	7.8
Actuated g/C Ratio	0.66	0.66		0.66	0.16	0.16
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	2342	1018		2069	277	225
v/s Ratio Prot	0.20				c0.03	
v/s Ratio Perm		0.18		c0.23		0.00
v/c Ratio	0.30	0.28		0.34	0.17	0.02
Uniform Delay, d1	3.5	3.5		3.7	18.1	17.7
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2		0.1	0.3	0.0
Delay (s)	3.6	3.6		3.8	18.4	17.8
Level of Service	A	A		A	B	B
Approach Delay (s)	3.6			3.8	18.1	
Approach LOS	A			A	B	

### Intersection Summary

HCM 2000 Control Delay	4.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	49.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 1: Lower-Campus Road & Dole St

06/15/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑	↑
Traffic Volume (vph)	697	351	26	442	255	249
Future Volume (vph)	697	351	26	442	255	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	0.95	1.00		0.95	1.00	1.00
Frbp, ped/bikes	1.00	0.92		1.00	1.00	0.89
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3539	1461		3525	1770	1405
Flt Permitted	1.00	1.00		0.90	0.95	1.00
Satd. Flow (perm)	3539	1461		3187	1770	1405
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	734	369	27	465	268	262
RTOR Reduction (vph)	0	199	0	0	0	58
Lane Group Flow (vph)	734	170	0	492	268	204
Confl. Peds. (#/hr)		95	95			146
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	19.4	19.4		19.4	13.8	13.8
Effective Green, g (s)	19.4	19.4		19.4	13.8	13.8
Actuated g/C Ratio	0.46	0.46		0.46	0.33	0.33
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1626	671		1465	578	459
v/s Ratio Prot	c0.21				c0.15	
v/s Ratio Perm		0.12		0.15		0.15
v/c Ratio	0.45	0.25		0.34	0.46	0.44
Uniform Delay, d1	7.8	7.0		7.3	11.3	11.2
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2		0.1	0.6	0.7
Delay (s)	8.0	7.2		7.4	11.9	11.9
Level of Service	A	A		A	B	B
Approach Delay (s)	7.7			7.4	11.9	
Approach LOS	A			A	B	

### Intersection Summary

HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	42.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 2: East-West Rd & Dole St

06/15/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕					↕		↕
Traffic Volume (vph)	254	420	4	2	508	350	0	0	0	141	0	141
Future Volume (vph)	254	420	4	2	508	350	0	0	0	141	0	141
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0					5.0		5.0
Lane Util. Factor		0.95			0.95					1.00		1.00
Frbp, ped/bikes		1.00			0.98					1.00		0.89
Flpb, ped/bikes		1.00			1.00					0.96		1.00
Frt		1.00			0.94					1.00		0.85
Flt Protected		0.98			1.00					0.95		1.00
Satd. Flow (prot)		3466			3255					1696		1407
Flt Permitted		0.55			0.95					0.95		1.00
Satd. Flow (perm)		1932			3105					1696		1407
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	267	442	4	2	535	368	0	0	0	148	0	148
RTOR Reduction (vph)	0	0	0	0	159	0	0	0	0	0	0	119
Lane Group Flow (vph)	0	713	0	0	746	0	0	0	0	148	0	29
Confl. Peds. (#/hr)	20		4	4		20	109		45	45		109
Turn Type	custom	NA		Perm	NA					Perm		Perm
Protected Phases	5	5 2			6							
Permitted Phases	2			6						4		4
Actuated Green, G (s)		34.9			21.1					10.9		10.9
Effective Green, g (s)		34.9			21.1					10.9		10.9
Actuated g/C Ratio		0.63			0.38					0.20		0.20
Clearance Time (s)					5.0					5.0		5.0
Vehicle Extension (s)					3.0					3.0		3.0
Lane Grp Cap (vph)		1450			1174					331		274
v/s Ratio Prot		c0.08										
v/s Ratio Perm		0.23			c0.24					c0.09		0.02
v/c Ratio		0.49			0.64					0.45		0.11
Uniform Delay, d1		5.7			14.2					19.8		18.4
Progression Factor		1.00			1.00					1.00		1.00
Incremental Delay, d2		0.3			1.1					1.0		0.2
Delay (s)		5.9			15.3					20.8		18.6
Level of Service		A			B					C		B
Approach Delay (s)		5.9			15.3		0.0				19.7	
Approach LOS		A			B		A				B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			12.5				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			55.8				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			65.5%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: East-West Rd & Dole St

06/15/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕			↕↕					↕		↕	
Traffic Volume (vph)	236	663	15	2	258	114	0	0	0	265	0	150	
Future Volume (vph)	236	663	15	2	258	114	0	0	0	265	0	150	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.5			4.5					4.5		4.5	
Lane Util. Factor		0.95			0.95					1.00		1.00	
Frbp, ped/bikes		1.00			0.98					1.00		0.89	
Flpb, ped/bikes		1.00			1.00					0.76		1.00	
Frt		1.00			0.95					1.00		0.85	
Flt Protected		0.99			1.00					0.95		1.00	
Satd. Flow (prot)		3471			3320					1351		1410	
Flt Permitted		0.72			0.95					0.95		1.00	
Satd. Flow (perm)		2541			3153					1351		1410	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	246	691	16	2	269	119	0	0	0	276	0	156	
RTOR Reduction (vph)	0	1	0	0	55	0	0	0	0	0	0	103	
Lane Group Flow (vph)	0	952	0	0	335	0	0	0	0	276	0	53	
Confl. Peds. (#/hr)	21		8	8		21	99		236	236		99	
Confl. Bikes (#/hr)												1	
Turn Type	custom	NA		Perm	NA					Perm		Perm	
Protected Phases	7	7 4			8								
Permitted Phases	4			8						6		6	
Actuated Green, G (s)		30.8			13.3					20.3		20.3	
Effective Green, g (s)		30.8			13.3					20.3		20.3	
Actuated g/C Ratio		0.51			0.22					0.34		0.34	
Clearance Time (s)					4.5					4.5		4.5	
Vehicle Extension (s)					3.0					3.0		3.0	
Lane Grp Cap (vph)		1503			697					456		476	
v/s Ratio Prot		c0.14											
v/s Ratio Perm		c0.19			0.11					c0.20		0.04	
v/c Ratio		0.63			0.48					0.61		0.11	
Uniform Delay, d1		10.6			20.4					16.6		13.7	
Progression Factor		1.00			1.00					1.00		1.00	
Incremental Delay, d2		0.9			0.5					2.3		0.1	
Delay (s)		11.5			20.9					18.8		13.8	
Level of Service		B			C					B		B	
Approach Delay (s)		11.5			20.9			0.0			17.0		
Approach LOS		B			C			A			B		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			14.9									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.67										
Actuated Cycle Length (s)			60.1							13.5		Sum of lost time (s)	
Intersection Capacity Utilization			64.8%									ICU Level of Service	C
Analysis Period (min)			15										

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 3: St. Louis Dr & Dole St

06/15/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	503	707	130	303	94
Future Volume (Veh/h)	32	503	707	130	303	94
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	33	519	729	134	312	97
Pedestrians	18			30		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	3.5			3.5		
Percent Blockage	2			3		
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1922	360	330			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1922	360	330			
tC, single (s)	*5.4	*5.2	*3.1			
tC, 2 stage (s)						
tF (s)	*3.3	*3.1	2.2			
p0 queue free %	43	32	45			
cM capacity (veh/h)	58	767	1327			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	33	519	729	134	312	97
Volume Left	33	0	729	0	0	0
Volume Right	0	519	0	0	0	97
cSH	58	767	1327	1700	1700	1700
Volume to Capacity	0.57	0.68	0.55	0.08	0.18	0.06
Queue Length 95th (ft)	58	134	87	0	0	0
Control Delay (s)	130.9	18.9	11.0	0.0	0.0	0.0
Lane LOS	F	C	B			
Approach Delay (s)	25.6		9.3	0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			12.1			
Intersection Capacity Utilization			74.8%	ICU Level of Service	D	
Analysis Period (min)			15			

\* User Entered Value



# HCM Unsignalized Intersection Capacity Analysis

## 3: St. Louis Dr & Dole St

06/15/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	836	328	315	204	18
Future Volume (Veh/h)	42	836	328	315	204	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	43	853	335	321	208	18
Pedestrians	3			10		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	3.5			3.5		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1202	221	211			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1202	221	211			
tC, single (s)	*5.4	*5.2	*3.1			
tC, 2 stage (s)						
tF (s)	*3.3	*3.1	2.2			
p0 queue free %	81	7	77			
cM capacity (veh/h)	227	915	1439			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	43	853	335	321	208	18
Volume Left	43	0	335	0	0	0
Volume Right	0	853	0	0	0	18
cSH	227	915	1439	1700	1700	1700
Volume to Capacity	0.19	0.93	0.23	0.19	0.12	0.01
Queue Length 95th (ft)	17	360	23	0	0	0
Control Delay (s)	24.5	37.0	8.3	0.0	0.0	0.0
Lane LOS	C	E	A			
Approach Delay (s)	36.4		4.2	0.0		
Approach LOS	E					
Intersection Summary						
Average Delay			19.9			
Intersection Capacity Utilization			70.4%	ICU Level of Service	C	
Analysis Period (min)			15			

\* User Entered Value

---

**APPENDIX D**

**CAPACITY ANALYSIS CALCULATIONS**  
**PROJECTED YEAR 2025 PEAK PERIOD TRAFFIC**  
**ANALYSIS WITHOUT PROJECT**

---

# HCM Signalized Intersection Capacity Analysis

## 1: Lower-Campus Road & Dole St

06/15/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑	↑
Traffic Volume (vph)	697	409	43	615	46	31
Future Volume (vph)	697	409	43	615	46	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	0.95	1.00		0.95	1.00	1.00
Frbp, ped/bikes	1.00	0.97		1.00	1.00	0.90
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3539	1538		3527	1770	1431
Flt Permitted	1.00	1.00		0.88	0.95	1.00
Satd. Flow (perm)	3539	1538		3110	1770	1431
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	758	445	47	668	50	34
RTOR Reduction (vph)	0	146	0	0	0	29
Lane Group Flow (vph)	758	299	0	715	50	5
Confl. Peds. (#/hr)		20	10			123
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	34.5	34.5		34.5	7.9	7.9
Effective Green, g (s)	34.5	34.5		34.5	7.9	7.9
Actuated g/C Ratio	0.67	0.67		0.67	0.15	0.15
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	2375	1032		2087	272	219
v/s Ratio Prot	0.21				c0.03	
v/s Ratio Perm		0.19		c0.23		0.00
v/c Ratio	0.32	0.29		0.34	0.18	0.02
Uniform Delay, d1	3.5	3.4		3.6	18.9	18.5
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2		0.1	0.3	0.0
Delay (s)	3.6	3.6		3.7	19.3	18.5
Level of Service	A	A		A	B	B
Approach Delay (s)	3.6			3.7	19.0	
Approach LOS	A			A	B	

### Intersection Summary

HCM 2000 Control Delay	4.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	51.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 1: Lower-Campus Road & Dole St

06/15/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑	↑
Traffic Volume (vph)	737	357	26	513	268	249
Future Volume (vph)	737	357	26	513	268	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	0.95	1.00		0.95	1.00	1.00
Frbp, ped/bikes	1.00	0.92		1.00	1.00	0.88
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3539	1457		3527	1770	1400
Flt Permitted	1.00	1.00		0.91	0.95	1.00
Satd. Flow (perm)	3539	1457		3200	1770	1400
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	776	376	27	540	282	262
RTOR Reduction (vph)	0	201	0	0	0	51
Lane Group Flow (vph)	776	175	0	567	282	211
Confl. Peds. (#/hr)		95	95			146
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	20.3	20.3		20.3	14.3	14.3
Effective Green, g (s)	20.3	20.3		20.3	14.3	14.3
Actuated g/C Ratio	0.47	0.47		0.47	0.33	0.33
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1647	678		1489	580	459
v/s Ratio Prot	c0.22				c0.16	
v/s Ratio Perm		0.12		0.18		0.15
v/c Ratio	0.47	0.26		0.38	0.49	0.46
Uniform Delay, d1	8.0	7.1		7.6	11.7	11.6
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2		0.2	0.6	0.7
Delay (s)	8.2	7.3		7.7	12.4	12.3
Level of Service	A	A		A	B	B
Approach Delay (s)	7.9			7.7	12.3	
Approach LOS	A			A	B	

### Intersection Summary

HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	43.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 2: East-West Rd & Dole St

06/15/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕					↕		↕
Traffic Volume (vph)	300	420	4	2	508	386	0	0	0	148	0	151
Future Volume (vph)	300	420	4	2	508	386	0	0	0	148	0	151
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0					5.0		5.0
Lane Util. Factor		0.95			0.95					1.00		1.00
Frbp, ped/bikes		1.00			0.98					1.00		0.89
Flpb, ped/bikes		1.00			1.00					0.96		1.00
Frt		1.00			0.94					1.00		0.85
Flt Protected		0.98			1.00					0.95		1.00
Satd. Flow (prot)		3459			3238					1694		1404
Flt Permitted		0.55			0.95					0.95		1.00
Satd. Flow (perm)		1948			3088					1694		1404
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	442	4	2	535	406	0	0	0	156	0	159
RTOR Reduction (vph)	0	0	0	0	171	0	0	0	0	0	0	128
Lane Group Flow (vph)	0	762	0	0	772	0	0	0	0	156	0	31
Confl. Peds. (#/hr)	20		4	4		20	109		45	45		109
Turn Type	custom	NA		Perm	NA					Perm		Perm
Protected Phases	5	5 2			6							
Permitted Phases	2			6						4		4
Actuated Green, G (s)		35.8			22.1					11.2		11.2
Effective Green, g (s)		35.8			22.1					11.2		11.2
Actuated g/C Ratio		0.63			0.39					0.20		0.20
Clearance Time (s)					5.0					5.0		5.0
Vehicle Extension (s)					3.0					3.0		3.0
Lane Grp Cap (vph)		1454			1197					332		275
v/s Ratio Prot		c0.08										
v/s Ratio Perm		0.25			c0.25					c0.09		0.02
v/c Ratio		0.52			0.65					0.47		0.11
Uniform Delay, d1		5.9			14.2					20.3		18.8
Progression Factor		1.00			1.00					1.00		1.00
Incremental Delay, d2		0.3			1.2					1.1		0.2
Delay (s)		6.2			15.5					21.3		19.0
Level of Service		A			B					C		B
Approach Delay (s)		6.2			15.5		0.0				20.2	
Approach LOS		A			B		A				C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			12.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			57.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			68.5%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: East-West Rd & Dole St

06/15/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕					↕		↕
Traffic Volume (vph)	276	663	15	2	258	143	0	0	0	305	0	221
Future Volume (vph)	276	663	15	2	258	143	0	0	0	305	0	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5					4.5		4.5
Lane Util. Factor		0.95			0.95					1.00		1.00
Frbp, ped/bikes		1.00			0.98					1.00		0.88
Flpb, ped/bikes		1.00			1.00					0.74		1.00
Frt		1.00			0.95					1.00		0.85
Flt Protected		0.99			1.00					0.95		1.00
Satd. Flow (prot)		3466			3281					1310		1394
Flt Permitted		0.68			0.92					0.95		1.00
Satd. Flow (perm)		2386			3011					1310		1394
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	288	691	16	2	269	149	0	0	0	318	0	230
RTOR Reduction (vph)	0	1	0	0	83	0	0	0	0	0	0	148
Lane Group Flow (vph)	0	994	0	0	337	0	0	0	0	318	0	82
Confl. Peds. (#/hr)	21		8	8		21	99		236	236		99
Confl. Bikes (#/hr)												1
Turn Type	custom	NA		Perm	NA					Perm		Perm
Protected Phases	7	7.4			8							
Permitted Phases	4			8						6		6
Actuated Green, G (s)		33.4			13.6					23.7		23.7
Effective Green, g (s)		33.4			13.6					23.7		23.7
Actuated g/C Ratio		0.51			0.21					0.36		0.36
Clearance Time (s)					4.5					4.5		4.5
Vehicle Extension (s)					3.0					3.0		3.0
Lane Grp Cap (vph)		1455			619					469		499
v/s Ratio Prot		c0.16										
v/s Ratio Perm		c0.19			0.11					c0.24		0.06
v/c Ratio		0.68			0.54					0.68		0.17
Uniform Delay, d1		12.4			23.5					18.0		14.5
Progression Factor		1.00			1.00					1.00		1.00
Incremental Delay, d2		1.3			1.0					3.9		0.2
Delay (s)		13.7			24.5					21.8		14.6
Level of Service		B			C					C		B
Approach Delay (s)		13.7			24.5		0.0				18.8	
Approach LOS		B			C		A				B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.4				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			66.1				Sum of lost time (s)			13.5		
Intersection Capacity Utilization			68.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 3: St. Louis Dr & Dole St

06/15/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	510	743	130	303	94
Future Volume (Veh/h)	32	510	743	130	303	94
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	33	526	766	134	312	97
Pedestrians	18			30		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	3.5			3.5		
Percent Blockage	2			3		
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1996	360	330			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1996	360	330			
tC, single (s)	*5.4	*5.2	*3.1			
tC, 2 stage (s)						
tF (s)	*3.3	*3.1	2.2			
p0 queue free %	33	31	42			
cM capacity (veh/h)	49	767	1327			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	33	526	766	134	312	97
Volume Left	33	0	766	0	0	0
Volume Right	0	526	0	0	0	97
cSH	49	767	1327	1700	1700	1700
Volume to Capacity	0.67	0.69	0.58	0.08	0.18	0.06
Queue Length 95th (ft)	66	138	97	0	0	0
Control Delay (s)	168.5	19.3	11.3	0.0	0.0	0.0
Lane LOS	F	C	B			
Approach Delay (s)	28.1		9.7	0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			13.1			
Intersection Capacity Utilization			76.8%	ICU Level of Service	D	
Analysis Period (min)			15			

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

## 3: St. Louis Dr & Dole St

06/15/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	876	357	315	204	18
Future Volume (Veh/h)	42	876	357	315	204	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	43	894	364	321	208	18
Pedestrians	3			10		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	3.5			3.5		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1260	221	211			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1260	221	211			
tC, single (s)	*5.4	*5.2	*3.1			
tC, 2 stage (s)						
tF (s)	*3.3	*3.1	2.2			
p0 queue free %	79	2	75			
cM capacity (veh/h)	207	915	1439			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	43	894	364	321	208	18
Volume Left	43	0	364	0	0	0
Volume Right	0	894	0	0	0	18
cSH	207	915	1439	1700	1700	1700
Volume to Capacity	0.21	0.98	0.25	0.19	0.12	0.01
Queue Length 95th (ft)	19	426	25	0	0	0
Control Delay (s)	26.9	45.6	8.3	0.0	0.0	0.0
Lane LOS	D	E	A			
Approach Delay (s)	44.7		4.4	0.0		
Approach LOS	E					
Intersection Summary						
Average Delay			24.3			
Intersection Capacity Utilization			72.9%	ICU Level of Service	C	
Analysis Period (min)			15			

\* User Entered Value



---

**APPENDIX E**

**CAPACITY ANALYSIS CALCULATIONS**  
**PROJECTED YEAR 2025 PEAK PERIOD TRAFFIC**  
**ANALYSIS WITH PROJECT**

---

# HCM Signalized Intersection Capacity Analysis

## 1: Lower-Campus Road & Dole St

06/15/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑	↑
Traffic Volume (vph)	710	409	43	625	46	31
Future Volume (vph)	710	409	43	625	46	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	0.95	1.00		0.95	1.00	1.00
Frbp, ped/bikes	1.00	0.97		1.00	1.00	0.90
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3539	1537		3527	1770	1429
Flt Permitted	1.00	1.00		0.88	0.95	1.00
Satd. Flow (perm)	3539	1537		3108	1770	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	772	445	47	679	50	34
RTOR Reduction (vph)	0	145	0	0	0	29
Lane Group Flow (vph)	772	300	0	726	50	5
Confl. Peds. (#/hr)		20	10			123
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	35.1	35.1		35.1	7.9	7.9
Effective Green, g (s)	35.1	35.1		35.1	7.9	7.9
Actuated g/C Ratio	0.68	0.68		0.68	0.15	0.15
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	2388	1037		2097	268	217
v/s Ratio Prot	0.22				c0.03	
v/s Ratio Perm		0.20		c0.23		0.00
v/c Ratio	0.32	0.29		0.35	0.19	0.02
Uniform Delay, d1	3.5	3.4		3.6	19.2	18.8
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2		0.1	0.3	0.0
Delay (s)	3.6	3.6		3.7	19.6	18.8
Level of Service	A	A		A	B	B
Approach Delay (s)	3.6			3.7	19.3	
Approach LOS	A			A	B	

### Intersection Summary

HCM 2000 Control Delay	4.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	52.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 1: Lower-Campus Road & Dole St

06/15/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑	↑
Traffic Volume (vph)	748	357	26	525	268	249
Future Volume (vph)	748	357	26	525	268	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	0.95	1.00		0.95	1.00	1.00
Frbp, ped/bikes	1.00	0.92		1.00	1.00	0.88
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3539	1455		3527	1770	1396
Flt Permitted	1.00	1.00		0.91	0.95	1.00
Satd. Flow (perm)	3539	1455		3202	1770	1396
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	787	376	27	553	282	262
RTOR Reduction (vph)	0	197	0	0	0	50
Lane Group Flow (vph)	787	179	0	580	282	212
Confl. Peds. (#/hr)		95	95			146
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	21.2	21.2		21.2	14.4	14.4
Effective Green, g (s)	21.2	21.2		21.2	14.4	14.4
Actuated g/C Ratio	0.48	0.48		0.48	0.32	0.32
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1682	691		1522	571	450
v/s Ratio Prot	c0.22				c0.16	
v/s Ratio Perm		0.12		0.18		0.15
v/c Ratio	0.47	0.26		0.38	0.49	0.47
Uniform Delay, d1	7.9	7.0		7.5	12.2	12.1
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2		0.2	0.7	0.8
Delay (s)	8.1	7.2		7.7	12.8	12.8
Level of Service	A	A		A	B	B
Approach Delay (s)	7.8			7.7	12.8	
Approach LOS	A			A	B	

### Intersection Summary

HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	44.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 2: East-West Rd & Dole St

06/15/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕			↕↕					↕		↕	
Traffic Volume (vph)	300	433	4	2	511	386	0	0	0	155	0	158	
Future Volume (vph)	300	433	4	2	511	386	0	0	0	155	0	158	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		5.0			5.0					5.0		5.0	
Lane Util. Factor		0.95			0.95					1.00		1.00	
Frbp, ped/bikes		1.00			0.98					1.00		0.88	
Flpb, ped/bikes		1.00			1.00					0.96		1.00	
Frt		1.00			0.94					1.00		0.85	
Flt Protected		0.98			1.00					0.95		1.00	
Satd. Flow (prot)		3461			3238					1693		1401	
Flt Permitted		0.55			0.95					0.95		1.00	
Satd. Flow (perm)		1943			3088					1693		1401	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	316	456	4	2	538	406	0	0	0	163	0	166	
RTOR Reduction (vph)	0	0	0	0	169	0	0	0	0	0	0	133	
Lane Group Flow (vph)	0	776	0	0	777	0	0	0	0	163	0	33	
Confl. Peds. (#/hr)	20		4	4		20	109			45	45	109	
Turn Type	custom	NA		Perm	NA					Perm		Perm	
Protected Phases	5	5 2			6								
Permitted Phases	2			6						4		4	
Actuated Green, G (s)		36.4			22.4					11.5		11.5	
Effective Green, g (s)		36.4			22.4					11.5		11.5	
Actuated g/C Ratio		0.63			0.39					0.20		0.20	
Clearance Time (s)					5.0					5.0		5.0	
Vehicle Extension (s)					3.0					3.0		3.0	
Lane Grp Cap (vph)		1457			1194					336		278	
v/s Ratio Prot		c0.08											
v/s Ratio Perm		0.25			c0.25					c0.10		0.02	
v/c Ratio		0.53			0.65					0.49		0.12	
Uniform Delay, d1		6.0			14.5					20.6		19.0	
Progression Factor		1.00			1.00					1.00		1.00	
Incremental Delay, d2		0.4			1.3					1.1		0.2	
Delay (s)		6.4			15.8					21.7		19.2	
Level of Service		A			B					C		B	
Approach Delay (s)		6.4			15.8			0.0			20.4		
Approach LOS		A			B			A			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			13.0									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.60										
Actuated Cycle Length (s)			57.9									Sum of lost time (s)	15.0
Intersection Capacity Utilization			69.3%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													



# HCM Signalized Intersection Capacity Analysis

## 2: East-West Rd & Dole St

06/15/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕					↕		↕
Traffic Volume (vph)	276	674	15	2	262	143	0	0	0	313	0	229
Future Volume (vph)	276	674	15	2	262	143	0	0	0	313	0	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5					4.5		4.5
Lane Util. Factor		0.95			0.95					1.00		1.00
Frbp, ped/bikes		1.00			0.98					1.00		0.88
Flpb, ped/bikes		1.00			1.00					0.74		1.00
Frt		1.00			0.95					1.00		0.85
Flt Protected		0.99			1.00					0.95		1.00
Satd. Flow (prot)		3466			3283					1303		1392
Flt Permitted		0.68			0.91					0.95		1.00
Satd. Flow (perm)		2376			2986					1303		1392
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	288	702	16	2	273	149	0	0	0	326	0	239
RTOR Reduction (vph)	0	1	0	0	81	0	0	0	0	0	0	153
Lane Group Flow (vph)	0	1005	0	0	343	0	0	0	0	326	0	86
Confl. Peds. (#/hr)	21		8	8		21	99		236	236		99
Confl. Bikes (#/hr)												1
Turn Type	custom	NA		Perm	NA					Perm		Perm
Protected Phases	7	7.4			8							
Permitted Phases	4			8						6		6
Actuated Green, G (s)		33.9			13.8					24.2		24.2
Effective Green, g (s)		33.9			13.8					24.2		24.2
Actuated g/C Ratio		0.51			0.21					0.36		0.36
Clearance Time (s)					4.5					4.5		4.5
Vehicle Extension (s)					3.0					3.0		3.0
Lane Grp Cap (vph)		1453			614					469		502
v/s Ratio Prot		c0.16										
v/s Ratio Perm		c0.19			0.11					c0.25		0.06
v/c Ratio		0.69			0.56					0.70		0.17
Uniform Delay, d1		12.6			23.9					18.3		14.6
Progression Factor		1.00			1.00					1.00		1.00
Incremental Delay, d2		1.4			1.1					4.4		0.2
Delay (s)		14.1			25.0					22.7		14.8
Level of Service		B			C					C		B
Approach Delay (s)		14.1			25.0		0.0				19.4	
Approach LOS		B			C		A				B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			67.1				Sum of lost time (s)			13.5		
Intersection Capacity Utilization			69.5%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 3: St. Louis Dr & Dole St

06/15/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	520	755	130	303	94
Future Volume (Veh/h)	32	520	755	130	303	94
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	33	536	778	134	312	97
Pedestrians	18			30		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	3.5			3.5		
Percent Blockage	2			3		
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2020	360	330			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2020	360	330			
tC, single (s)	*5.4	*5.2	*3.1			
tC, 2 stage (s)						
tF (s)	*3.3	*3.1	2.2			
p0 queue free %	30	30	41			
cM capacity (veh/h)	47	767	1327			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	33	536	778	134	312	97
Volume Left	33	0	778	0	0	0
Volume Right	0	536	0	0	0	97
cSH	47	767	1327	1700	1700	1700
Volume to Capacity	0.70	0.70	0.59	0.08	0.18	0.06
Queue Length 95th (ft)	69	145	100	0	0	0
Control Delay (s)	183.5	19.8	11.5	0.0	0.0	0.0
Lane LOS	F	C	B			
Approach Delay (s)	29.3		9.8	0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			13.6			
Intersection Capacity Utilization			77.4%	ICU Level of Service	D	
Analysis Period (min)			15			

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

## 3: St. Louis Dr & Dole St

06/15/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	888	368	315	204	18
Future Volume (Veh/h)	42	888	368	315	204	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	43	906	376	321	208	18
Pedestrians	3			10		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	3.5			3.5		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1284	221	211			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1284	221	211			
tC, single (s)	*5.4	*5.2	*3.1			
tC, 2 stage (s)						
tF (s)	*3.3	*3.1	2.2			
p0 queue free %	78	1	74			
cM capacity (veh/h)	199	915	1439			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	43	906	376	321	208	18
Volume Left	43	0	376	0	0	0
Volume Right	0	906	0	0	0	18
cSH	199	915	1439	1700	1700	1700
Volume to Capacity	0.22	0.99	0.26	0.19	0.12	0.01
Queue Length 95th (ft)	20	446	26	0	0	0
Control Delay (s)	28.0	48.6	8.4	0.0	0.0	0.0
Lane LOS	D	E	A			
Approach Delay (s)	47.6		4.5	0.0		
Approach LOS	E					
Intersection Summary						
Average Delay			25.8			
Intersection Capacity Utilization			73.7%	ICU Level of Service	D	
Analysis Period (min)			15			

\* User Entered Value

# **APPENDIX F**

---

Pre-Consultation Letters and Responses



## Appendix F: Pre-Consultation Parties

Agency/Entity	Division/District	Contact Person
<b><i>Federal Agencies</i></b>		
U.S. Department of Army Corps Engineers	Hawaii Division – Honolulu District	N/A
U.S. Fish and Wildlife Services	Pacific Region	N/A
<b><i>State of Hawai'i</i></b>		
Department of Land and Natural Resources	Engineering Division Land Division Division of Aquatic Resources Division of Water Resource Management Division of Boat and Ocean Recreation	Suzanne Case
Dept. of Land and Natural Resources	Historic Preservation Division	Alan Downer, PhD
Dept. of Land and Natural Resources	Office of Conservation and Coastal Lands	Samuel J. Lemmo
Department of Health	N/A	Virginia Pressler, M.D.
Department of Health	Environmental Health Administration	Keith Kawakoa
Department of Health	Clean Water Branch Environmental Management Division	N/A
Department of Education	N/A	Christina Kishimoto, Ed. D
Dept. of Business, Economic Development, & Tourism	N/A	Luis P. Salaveria
Office of Hawaiian Affairs	N/A	Sylvia Hussey, Ed. D
<b><i>State Officials</i></b>		
District 11	Senator	Brian T. Taniguchi
District 24	Representative	Della Au Belatti
<b><i>City and County of Honolulu</i></b>		

<b>Agency/Entity</b>	<b>Division/District</b>	<b>Contact Person</b>
Dept. of Parks & Recreation	N/A	Michael K. Nekota
Dept. of Planning & Permitting	N/A	Kathy K. Sokugawa
Dept. of Design & Construction	N/A	Robert Kroning, P.E.
Dept. of Facility Maintenance	N/A	Ross S. Sasamura
Dept. of Environmental Services	N/A	Lori M. K. Kahikina
Dept. of Transportation Services	N/A	Wes Frysztacki
Honolulu Police Department	N/A	Chief Susan Ballard
Honolulu Fire Department	N/A	Chief Manual P. Neves
Board of Water Supply	N/A	Ernest Y. W. Lau, P.E.
<b><i>City Official</i></b>		
District 5	Council Member	Ann Kobayashi
<b><i>Neighborhood Boards</i></b>		
Mānoa	Neighborhood Board No. 7	Dylan Armstrong
McCully/ Mō'ili'ili	Neighborhood Board No. 8	Timothy Streit
Diamond Head/Kapahulu/St. Louis Heights	Neighborhood Board No. 5	Richard Figiluzzi
<b><i>Private Organizations</i></b>		
Ala Wai Watershed Association	N/A	Tom Heinrich
Kaimana Lanais	N/A	N/A
Chen, Francis & Edna Trust	N/A	N/A
Wheeler, Family Trust	N/A	N/A

Agency/Entity	Division/District	Contact Person
Ala Wai Skyrise	N/A	N/A
Kapi'olani Gardens	N/A	N/A
Ala Wai Plaza	N/A	N/A
AOAO The Twin Towers Inc.	N/A	N/A
Lanikea at Waikiki	N/A	N/A
Pacific Living Trust	N/A	N/A
La Casa	N/A	N/A
WBL Inc.	N/A	N/A
N T P Lynn's Investment Corp.	N/A	N/A
Hale Moani	N/A	N/A
2121 Ala Wai	N/A	N/A
Hawaiian Electric Company, Inc.	N/A	N/A
Four Paddle	N/A	N/A
Kapiolani Real Estate LLC	N/A	N/A
411 Kaiolu Inc.	N/A	N/A
Aloha Towers	N/A	N/A
Rosalei Ltd.	N/A	N/A
Ariali Realty Inc.	N/A	N/A

Agency/Entity	Division/District	Contact Person
Lanikea at Waikiki	N/A	N/A
<b>Schools</b>		
'Iolani School	N/A	N/A
<b>Individuals</b>		
N/A	Fee Owner	Juan I. Ramos
N/A	Fee Owner	Donna L. Gayer & John J.D. Gayer
N/A	Fee Owner	Robert D.M. Au & Audrey M. Au
The Promenade	Fee Owner	Mary E. Gabriel
The Promenade	Fee Owner	Kathleen L. Street
The Promenade	Fee Owner	Patricia A. Street



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

June 12, 2020

LD540

ATTN: Allen Kam, Director of Planning  
Belt Collins Hawai'i LLC  
2153 North King Street, Suite 200  
Honolulu, HI 96819-4554

*via email: akam@bchdesign.com*

Dear Sirs:

SUBJECT: Pre-Consultation for an Environmental Assessment, Proposed University of Hawai'i-Manoa Campus Student and Faculty Multi-Family Housing; 2570 Dole Street, Honolulu, Oahu, Hawai'i; TMK: (1) 2-8-023:009.

Thank you for the opportunity to review and comment on the subject project. The Land Division of the Department of Land and Natural Resources (DLNR) distributed copies of your request to DLNR's various Divisions for their review and comment.

Attached are comments received from our (a) Engineering Division, (b) Division of Aquatic Resources, and (c) Division of Forestry and Wildlife. Should you have any questions about the attached comments, please feel free to contact Barbara Lee via email at [barbara.j.lee@hawaii.gov](mailto:barbara.j.lee@hawaii.gov). Thank you.

Sincerely,

*Russell Tsuji*

Russell Y. Tsuji  
Land Administrator

Attachments

cc: Central Files



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

May 27, 2020

LD 540

MEMORANDUM

TO: **DLNR Agencies:**  
 Div. of Aquatic Resources  
 Div. of Boating & Ocean Recreation  
 Engineering Division  
 Div. of Forestry & Wildlife  
 Div. of State Parks  
 Commission on Water Resource Management  
 Office of Conservation & Coastal Lands  
 Land Division – Oahu District  
 Historic Preservation (via email: *DLNR.Intake.SHPD@hawaii.gov*)

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*

SUBJECT: **Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing**

LOCATION: 2570 Dole Street, Honolulu, Hawai'i  
TMK: (1) 2-8-023:009

APPLICANT: **Belt-Collins Hawaii LLC on behalf of University of Hawai'i at Mānoa**

Transmitted for your review and comment is information on the above-referenced subject. Please submit any comments to Land Division by **June 10, 2020**.

If no response is received by the above date, we will assume your agency has no comments. If you have any questions about this request, please contact Barbara Lee via email at the following address: [barbara.j.lee@hawaii.gov](mailto:barbara.j.lee@hawaii.gov). Thank you.

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

Signed: *[Signature]*

Attachments  
Cc: Central Files

Print Name: Brian J. Neilson- DAR Administrator

Date: Jun 9, 2020

DAVID Y. IGE  
GOVERNOR OF  
HAWAII



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

ROBERT K. MASUDA  
FIRST DEPUTY

M. KALEO MANUEL  
DEPUTY DIRECTOR - WATER

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



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF AQUATIC RESOURCES  
1151 PUNCHBOWL STREET, ROOM 330  
HONOLULU, HAWAII 96813

Date: 6/8/2020

DAR # CV0014

MEMORANDUM

TO: Brian J. Neilson  
DAR Administrator

FROM: Kimberly Fuller, Aquatic Biologist

SUBJECT: Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus (UHM)

Request Submitted by: Belt-Collins Hawaii LLC on behalf of University of Hawai'i at Mānoa  
2570 Dole Street, Honolulu, Hawai'i

Location of Project: TMK: (1) 2-8-023:009

Brief Description of Project:

UHM is proposing a Multi-Family Housing project on Mānoa campus on O'ahu, Hawai'i. The work will occur on Dole Street next to Mānoa Stream. An environmental assessment will be prepared for this project and preliminary input is required by June 12, 2020. The proposed project area looks to be about 1.7 acres when overlaying the footprint in provided materials on map software.

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: Jun 9, 2020

Brian J. Neilson  
DAR Administrator



DAR# CV0014

Comments

Erosion and Land Based Source of Pollution (LBSP) Mitigation:

DAR recommends that best management practices for mitigation of erosion and LBSP be outlined in the EA. The close proximity to Mānoa Stream should be considered during design and construction. Landscape design and leveling should be such that long term erosion and LBSP are minimized.

During construction these measures would include any type of barrier (e.g. sediment barriers/bags, petroleum absorption diapers, etc.) that limits the amount of sediment or LBSP (e.g. petroleum products, chemicals, debris, etc.) to the maximum extent practicable. DAR recommends that all construction materials be composed of environmentally inert materials to the extent practicable. The Contractor shall consider the weather while performing construction. Some work may be performed during low rain conditions, but all construction would be halted during storm conditions or when storm conditions threaten the watershed.

DAR would like to request notification and photo-documentation of any occurrence where above-average amounts of sediment or pollution have entered the water, in order to assess impact, if any.

Consideration for Aquatic Life:

The primary danger to adjacent aquatic life is sediment and LBSP runoff. If there are other potential dangers associated with this work, they should be addressed in the EA.





July 23, 2020  
2020.70.0200 / 20P-058

Mr. Brian J. Neilson  
DAR Administrator  
State of Hawai'i  
Department of Land and Natural Resources  
Division of Aquatic Resources  
1151 Punchbowl Street, Room 330  
Honolulu, Hawai'i 96813

Dear Mr. Neilson:

**Response to Comments  
Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009**

Thank you for your memorandum dated June 8, 2020, commenting on the pre-consultation for the Draft Environmental Assessment (DEA) for the proposed University of Hawai'i Student and Faculty Multi-Family Housing project on the Mānoa campus. Please see our responses to your comments below:

- 1. Recommends BMP for mitigation of erosion and Land Based Source Pollution (LBSP) be outline in EA. The project's proximity to Mānoa Stream should be considered during design and construction. Landscape design and leveling should be such that long-term erosion and LBSP are minimized. Contractor shall consider the weather while performing construction.**

Both temporary and permanent Best Management Practices (BMPs) will be used to minimize erosion and LBSP in the project area. BMPs selected would be implemented into the project to mitigate erosion impacts. Construction activities will be halted during storm conditions or when storm conditions threaten the watershed to minimize LBSP and erosion. Discussion and evaluation of BMPs will be discussed in the DEA.

- 2. DAR requests notification and photo-documentation of any occurrence where above-average amounts of sediment or pollution have entered the water, in order to assess impact, if any.**

If any above-average amounts of sediment or pollution enter waterways adjacent to the project site during construction activities, DAR will be notified and sent photo-documentation to assess any impacts.



Mr. Brian J. Neilson  
July 23, 2020 / 20P-058  
Page 2

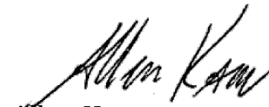
**3. Primary danger to aquatic life is sediment and LBSP runoff. If there are any other potential dangers associated with this work, they should be addressed in EA.**

BMPs will be used to minimize impacts to aquatic life through sediment and LBSP runoff controls. The development team is aware of the significance and sensitivity of Mānoa Stream and will take every effort to ensure that Mānoa Stream is not impacted.

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the DEA. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam  
Director of Planning

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar

DAVID Y. IGE  
GOVERNOR OF HAWAII



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

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

May 27, 2020

LD 540

MEMORANDUM

FROM:

~~TO:~~

**DLNR Agencies:**

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division**
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division – Oahu District
- Historic Preservation (via email: DLNR.Intake.SHPD@hawaii.gov)

TO:

~~FROM:~~

Russell Y. Tsuji, Land Administrator *Russell Tsuji*

SUBJECT:

**Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing**

LOCATION:

2570 Dole Street, Honolulu, Hawai'i  
TMK: (1) 2-8-023:009

APPLICANT:

**Belt-Collins Hawaii LLC on behalf of University of Hawai'i at Mānoa**

Transmitted for your review and comment is information on the above-referenced subject. Please submit any comments to Land Division by **June 10, 2020**.

If no response is received by the above date, we will assume your agency has no comments. If you have any questions about this request, please contact Barbara Lee via email at the following address: barbara.j.lee@hawaii.gov. Thank you.

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

Signed:

*CS Chang*

Attachments  
Cc: Central Files

Print Name: Carty S. Chang, Chief Engineer  
Date: May 28, 2020

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

**LD/Russell Y. Tsuji**

**Ref: Pre-Consultation for an Environmental Assessment Proposed University of  
Hawaii-Manoa Campus Student and Faculty Multi-Family Housing  
TMK(s): (1) 2-8-023:009  
Location: 2570 Dole Street, Honolulu, Hawaii  
Applicant: Belt-Collins Hawaii LLC on behalf of University of Hawaii at  
Manoa**

**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.hawaiiinfip.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) 241-4896.

**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: May 28, 2020





July 23, 2020  
2020.70.0200 / 20P-060

Mr. Carty Chang, P.E.  
Chief Engineer  
State of Hawai'i  
Department of Land and Natural Resources  
Engineering Division  
Post Office Box 621  
Honolulu, Hawai'i 96809

Dear Mr. Chang:

**Response to Comments  
Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009**

Thank you for your memorandum dated May 28, 2020, commenting on the pre-consultation for the Draft Environmental Assessment (DEA) for the proposed University of Hawai'i Student and Faculty Multi-Family Housing project on the Mānoa campus. Please see our responses to your comments below:

**1. Rules and regulations of the National Flood Insurance Program (NFIP) when development falls within a Special Flood Hazard Area.**

The parcel is located within a NFIP Special Flood Hazard Area because the property line of the parcel is the centerline of Mānoa Stream. However, any construction activities and development will be located well inland of the stream and stream edge. Questions regarding local flood ordinances will be directed to the City and County of Honolulu's Department of Planning and Permitting.

**2. Applicant should include water demands and infrastructure requirements needed to meet project needs.**

A discussion of water demands and infrastructure requirements for the project will be included in the DEA. The Board of Water Supply (BWS) will be compensated for the Water System Facilities Charges for resource development, transmission and daily storage as required.



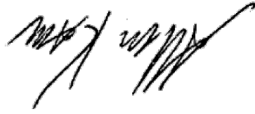
**3. Applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections.**

Once determined, water demand and calculations will be provided to the Department of Land and Natural Resource's Engineering Division for inclusion in the State Water Projects Plan Update projections.

Thank you again for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the DEA. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam  
Director of Planning

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

May 27, 2020

LD 540  
Log no 2655

**MEMORANDUM**

From: **DLNR Agencies:**  
\_\_\_ Div. of Aquatic Resources  
\_\_\_ Div. of Boating & Ocean Recreation  
\_\_\_ Engineering Division  
**X** Div. of Forestry & Wildlife  
\_\_\_ Div. of State Parks  
\_\_\_ Commission on Water Resource Management  
\_\_\_ Office of Conservation & Coastal Lands  
\_\_\_ Land Division – Oahu District  
\_\_\_ Historic Preservation (via email: *DLNR.Intake.SHPD@hawaii.gov*)

TO: Russell Y. Tsuji, Land Administrator *Russell Tsuji*  
SUBJECT: **Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing**  
LOCATION: 2570 Dole Street, Honolulu, Hawai'i  
TMK: (1) 2-8-023:009  
APPLICANT: **Belt-Collins Hawaii LLC on behalf of University of Hawai'i at Mānoa**

Transmitted for your review and comment is information on the above-referenced subject.  
Please submit any comments to Land Division by **June 10, 2020**.

If no response is received by the above date, we will assume your agency has no comments.  
If you have any questions about this request, please contact Barbara Lee via email at the following  
address: *barbara.j.lee@hawaii.gov*. Thank you.

- We have no objections.
  - We have no comments.
  - Comments are attached.
- DGS*

Signed: \_\_\_\_\_

Attachments  
Cc: Central Files

Print Name: DAVID G. SMITH  
Date: Jun 10, 2020

DAVID Y. IGE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF FORESTRY AND WILDLIFE  
1151 PUNCHBOWL STREET, ROOM 325  
HONOLULU, HAWAII 96813

June 8, 2020

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

ROBERT K. MASUDA  
FIRST DEPUTY

M. KALEO MANUEL  
DEPUTY DIRECTOR - WATER

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

Log no. 2655

MEMORANDUM

**TO:** RUSSELL Y. TSUJI, Administrator  
Land Division

**FROM:** DAVID G. SMITH, Administrator  
Division of Forestry and Wildlife

**SUBJECT:** **Division of Forestry and Wildlife Comments on Pre-Consultation for Environmental Assessment for University of Hawai'i-Mānoa Campus Student and Faculty Multi-Family Housing**

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your inquiry regarding pre-consultation for an Environmental Assessment for the proposed University of Hawai'i-Mānoa Campus student and faculty multi-family housing on previously developed land near Mānoa Stream in Honolulu on O'ahu, Hawai'i, TMK: (1) 2-8-023:009. The proposed project consists of the construction of two buildings 12 to 18 stories tall with 400 units total, and will include additional childcare, retail, and circulation facilities.

The State endangered White Tern (*Gygis alba*) has been recorded nesting at the proposed project site. If tree trimming or removal is planned, DOFAW strongly recommends surveying for the presence of White Terns prior to any action that could disturb the trees. White Tern pairs lay their single egg in a branch fork with no nest. The eggs and chicks can be easily dislodged by construction equipment that nudges the trees. If a nest is discovered, please notify DOFAW staff at (808) 587-0166 for assistance.

We note that artificial lighting can adversely impact seabirds that may pass through the area at night by causing disorientation. This disorientation can result in collision with manmade artifacts or grounding of birds. For nighttime lighting that might be required, DOFAW recommends that all lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. This is the period when young seabirds take their maiden voyage to the open sea. For illustrations and guidance related to seabird-friendly light styles that also protect the dark, starry skies of Hawai'i please visit: <https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf>.

The State listed Hawaiian Hoary Bat or 'Ōpe'ape'a (*Lasiurus cinereus semotus*) has the potential to occur in the vicinity of the project area and may roost in nearby trees. If any site clearing is required this should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW.



DOFAW recommends minimizing the movement of plant or soil material between worksites, such as in fill. Soil and plant material may contain invasive fungal pathogens (e.g. Rapid 'Ōhi'a Death), vertebrate and invertebrate pests (e.g. Little Fire Ants, Coconut Rhinoceros Beetles), or invasive plant parts that could harm our native species and ecosystems. We recommend consulting the O'ahu Invasive Species Committee at (808) 266-7994 in planning, design, and construction of the project to learn of any high-risk invasive species in the area and ways to mitigate spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species. Gear that may contain soil, such as work boots and vehicles, should be thoroughly cleaned with water and sprayed with 70% alcohol solution to prevent the spread of Rapid 'Ōhi'a Death and other harmful fungal pathogens.

DOFAW recommends using native plant species for landscaping that are appropriate for the area (i.e. climate conditions are suitable for the plants to thrive, historically occurred there, etc.). Please do not plant invasive species. DOFAW recommends consulting the Hawai'i-Pacific Weed Risk Assessment website to determine the potential invasiveness of plants proposed for use in the project (<https://sites.google.com/site/weedriskassessment/home>). We recommend that you refer to [www.plantpono.org](http://www.plantpono.org) for guidance on selection and evaluation for landscaping plants.

We appreciate your efforts to work with our office for the conservation of our native species. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Lauren Taylor, Protected Species Habitat Conservation Planning Coordinator at (808) 587-0010 or [lauren.taylor@hawaii.gov](mailto:lauren.taylor@hawaii.gov).

Sincerely,



DAVID G. SMITH  
Administrator



July 23, 2020  
2020.70.0200 / 20P-059

Mr. David G. Smith  
Administrator  
State of Hawai'i  
Department of Land and Natural Resources  
Division of Forestry and Wildlife  
1151 Punchbowl Street, 325  
Honolulu, Hawai'i 96813

Dear Mr. Smith:

**Response to Comments  
Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009**

Thank you for your memorandum dated May 27, 2020, commenting on the pre-consultation for the Draft Environmental Assessment (DEA) for the proposed University of Hawai'i Student and Faculty Multi-Family Housing project on the Mānoa campus. Please see our responses to your comments below:

**1. Potential impacts on state listed species during vegetation trimming or removal**

Prior to any tree trimming or removal activities, a qualified biologist will survey the area for the presence of white terns. If any active nests are located within the project area, the Division of Forestry and Wildlife (DOFAW) will be notified for assistance.

For the state listed Hawaiian hoary bat, efforts will be made to avoid vegetation clearing during the birthing and pup rearing season (June 1-September 15). If avoidance is not possible during this time period, DOFAW will be consulted prior to any disturbance. DOFAW will be consulted if trimming or removal of woody vegetation is greater than 15 feet (4.6 meters) in height.

A discussion of efforts to reduce impacts on white terns and Hawaiian hoary bats will be included in the DEA. If it becomes apparent that threatened or endangered species may be impacted, DOFAW will be contacted as soon as possible.



**2. Potential for artificial light use at night to adversely impact seabirds**

To minimize impacts on seabirds, downward facing and shielded lighting will be installed. Efforts will be made to avoid outdoor nighttime work during seabird fledging season (September 15 – December 15). A discussion of efforts to reduce impacts on wildlife would be included in the DEA.

**3. Potential impacts created by Invasive Species**

To control the spread of invasive species, movement of soil and plant material between worksites will be minimized. Efforts will be made to utilize suitable native species where appropriate in landscaping. Equipment, materials and personnel will be regularly cleared of excess soil and debris to reduce the spread of invasive species; and sterilization methods will be used on gear, including work boots and vehicles, to prevent the spread of fungal pathogens.

Thank you for your comments and for participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the DEA. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam  
Director of Planning

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar

**BOARD OF WATER SUPPLY**

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



May 29, 2020

KIRK CALDWELL, MAYOR

BRYAN P. ANDAYA, Chair  
KAPUA SPROAT, Vice Chair  
KAY C. MATSUI  
RAY C. SOON  
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 *lll*

Mr. Allen Kam  
Belt Collins Hawaii, LLC  
2153 North King Street, Suite 200  
Honolulu, Hawaii 96819-4554

Dear Mr. Kam:

Subject: Your Letter Dated May 20, 2020 Requesting Comments on the Proposed Environmental Assessment for the Proposed University of Hawaii – Manoa Campus Student and Faculty Multi-Family Housing Tax Map Key: 2-8-023: 009

Thank you for your letter regarding the proposed student and faculty multi-family housing apartments, which comprise of two buildings that will range from 12 to 18 stories with residential units, a dedicated childcare center, and retail spaces.

The existing water system is adequate to accommodate the proposed mixed-use apartment development. However, please be advised that this information is based upon current data, and therefore, the Board of Water Supply (BWS) reserves the right to change any position or information stated herein up until the final approval of the building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

Proposed mixed-use developments are required to install separate domestic water meters and laterals serving the residential and non-residential spaces.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

Water conservation measures are required for all proposed developments. These measures include utilization of nonpotable water for irrigation using rain catchment, drought tolerant plants, xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets.

BELT COLLINS HAWAII

2020 MAY 29 PM 3:33

RECEIVED



Mr. Allen Kam  
May 29, 2020  
Page 2

High-rise buildings with booster pumps will be required to install water hammer arrestors or expansion tanks to reduce pressure spikes and potential main breaks in our water system.

The proposed project is subject to BWS Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit Applications.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Ernest Y. W. Lau', with a large, stylized flourish at the end.

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



July 23, 2020  
2020.70.0200 / 20P-053

Mr. Ernest Y. W. Lau, P.E.  
Manager/Chief Engineer  
Board of Water Supply  
630 South Beretania Street  
Honolulu, Hawai'i 96843

Dear Mr. Lau:

**Response to Comments  
Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009**

Thank you for your letter dated May 29, 2020, commenting on the pre-consultation for the Draft Environmental Assessment (DEA) for the proposed University of Hawai'i Student and Faculty Multi-Family Housing project on the Mānoa campus. Please see our responses to your comments below:

**1. Adequacy of existing water system and final decision of water availability.**

Your response confirms that the existing water system is adequate to accommodate the project's water needs. We acknowledge that a final decision on water availability will be confirmed by Board of Water Supply (BWS) upon submitting a building permit application.

**2. Mixed-Use developments are required to install separate domestic water meters and laterals serving the residential and non-residential spaces.**

We acknowledge that the installation of separate domestic water meters and laterals is required to serve the residential and non-residential spaces. Final metering configuration will be determined during the design process.

**3. When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.**

Upon confirmation of water availability by BWS, payment for the Water System Facilities Charges for resource development, transmission and daily storage will be made as required by BWS Resolution No. 780 Revision to the Schedule of Rates and Charges for the Furnishing of Water and Water Service.



**4. Water conservation measures are required for the proposed development.**

Water conservation measures will be incorporated into the project design. The type and location will be determined during the design stage.

**5. High-rise buildings with booster pumps will be required to install water hammer arresters or expansion tanks to reduce pressure spikes and potential main breaks in the water system**

Booster pumps will have water hammer arresters or expansion tanks, as required, to reduce pressure spikes and potential water main breaks in the water system

**6. Proposed mixed-use developments and high-rise building design requirements, including BWS Cross-Connection Control and Backflow Prevention requirements, Building design requirements will be reviewed and integrated into the project as appropriate as part of the building permit application process.**

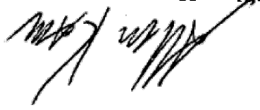
**7. On-site fire protection requirements.**

On-site fire protection will be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the DEA. If you have any questions, please contact the undersigned at 521-5361 or by email at akam@bchdesign.com.

Sincerely yours,

BELT COLLINS HAWAII LLC

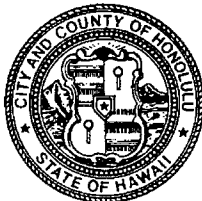
  
Allen Kam  
Director of Planning

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar

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 20-257

May 22, 2020

Mr. Allen Kam, Director of Planning  
Belt Collins  
2153 N. King Street, Suite 200  
Honolulu, Hawaii 96819

Dear Mr. Kam:

Subject: Pre-Consultation for an Environmental Assessment,  
Proposed University of Hawaii-Manoa Campus  
Student and Faculty Multi-Family Housing,  
2570 Dole Street, TMK: 2-8-023:009

Thank you for the opportunity to review and comment on the subject project.

This is our comments as follows:

- During construction and upon completion of the project, any damages/deficiencies along the bridges, sidewalks, and/or roadways on Dole Street shall be repaired to City standards and accepted by the City and at no cost to the City and County of Honolulu.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Ross S. Sasamura".

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





July 23, 2020  
2020.70.0200 / 20P-056

Mr. Ross S. Sasamura  
Director  
City & County of Honolulu  
Department of Facility Maintenance  
1000 Uluohia Street, Suite 215  
Kapolei, Hawai'i 96707

Dear Mr. Sasamura:

**Response to Comments  
Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009**

Thank you for your letter dated May 12, 2020, commenting on the pre-consultation for the Draft Environmental Assessment (DEA) for the proposed University of Hawai'i Student and Faculty Multi-Family Housing project on the Mānoa campus. Please see our responses to your comments below:

**1. Construction related damages/deficiencies along bridges, sidewalks, and/or roadways along Dole Street.**

Any damages/deficiencies along the bridges, sidewalks, and/or roadways on Dole Street as a result of project construction activities will be repaired to City standards and require acceptance by the City at no cost to the City and County of Honolulu.

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the DEA. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,  
BELT COLLINS HAWAII LLC

  
Allen Kam  
Director of Planning

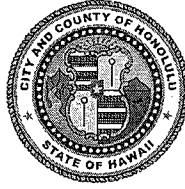
cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar



DEPARTMENT OF PLANNING AND PERMITTING  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET, 7<sup>TH</sup> FLOOR • HONOLULU, HAWAII 96813  
PHONE: (808) 768-8000 • FAX: (808) 768-6041  
DEPT. WEB SITE: [www.honolulu.gov](http://www.honolulu.gov) • CITY WEB SITE: [www.honoluludpp.org](http://www.honoluludpp.org)

KIRK CALDWELL  
MAYOR



KATHY K. SOKUGAWA  
ACTING DIRECTOR

TIMOTHY F. T. HIU  
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI  
DEPUTY DIRECTOR

June 12, 2020

2020/ELOG-945(GT)

Mr. Allen Kam  
Director of Planning  
Belt Collins Hawaii LLC  
2153 North King Street, Suite 200  
Honolulu, Hawaii 96819

Dear Mr. Kam:

SUBJECT: Pre-Assessment Consultation  
Draft Environmental Assessment (EA)  
Chapter 343, Hawaii Revised Statutes  
Proposed University of Hawaii – Manoa (UHM) Campus  
Student and Faculty Multi-Family Housing  
2570 Dole Street - Manoa  
Tax Map Key 2-8-023: 009

This is in response to your letter (received May 15, 2020), requesting comments on the pre-assessment consultation for the proposed UHM Campus Student and Faculty Multi-Family Housing (Project). We have reviewed the information provided and offer the following comments:

1. Land Use Permits Division:

The proposal requires a Minor Modification to the Plan Review Use Permit No. 2009/PRU-3 (PRU) for the UHM campus, approved by the City Council on March 17, 2010, as Resolution No. 09-341, CD1, FD1. As such, the EA will need to be completed before the PRU can be processed. The Draft EA should explain the how the Project will comply with the requirements for a Minor Modification to the existing PRU.

The Draft EA should:

RECEIVED  
2020 JUN 17 PM 2:05  
BELT COLLINS HAWAII

- a. Explain how the proposed Project will comply with the requirements of the R-5 Residential District and discuss any development standards that may need to be modified.
- b. List all permits required.
- c. Include specific proposals pertaining to the nearby bus stop, future location of a rail station and mechanisms to ensure pedestrian safety. We recommend that the Applicant keep the Department of Transportation Services and the Honolulu Authority on Rapid Transit informed and involved with the Project.
- d. Discuss how the proposed height of buildings compare to those nearby and impact neighborhood character.
- e. Include materials associated with the conversion of the NOAA site including the history of the property, current use, proposed project, and the relationship to the current PRU housing projects.
- f. Include images that show how the Project will impact neighboring views. Specifically, what the building(s) will look like from the St. Louis Drive and Dole Street intersection and from the University Avenue and Dole Street intersection.

2. Planning Division:

- a. Oahu General Plan (GP): The Draft EA should discuss how the proposed UHM Campus Student and Faculty Multi-Family Housing project fulfills the objectives and policies of the GP and the proposed revised GP (Resolution 20-44).
- b. Primary Urban Center Development Plan (PUC DP): The EA should discuss how the proposed Project fulfills the policies and guidelines of the PUC DP and how the proposed Project will assist in fulfilling the long-term vision of the Primary Urban Center area. Please also be advised that the PUC DP is being updated and materials regarding existing conditions of topics such as infrastructure and transportation, can be found on the Project website [www.pucdp.com](http://www.pucdp.com).
- c. Climate Change: In accordance with the Honolulu Climate Change Commission's Climate Change Brief (June 5, 2018), the City and County of Honolulu recognizes that the median global temperature is projected to increase 5.8 degrees Fahrenheit (3.2 degrees Celsius) this century. In addition, "warming air temperatures can lead to heat waves, expanded pathogen ranges and invasive species, thermal stress for native flora and

fauna, increased electricity demand, potential threats to human health, and increased evapotranspiration which both reduces water supply and increases demand”.

- d. The United States Environmental Protection Agency notes that the same measures commonly used to mitigate urban “heat islands” also help to address the adverse effects of global climate change. Heat islands are a phenomenon whereby some urbanized areas experience elevated surface and atmospheric temperatures when compared to nearby rural areas.
- e. To address the effects of global climate change, the EA should include an analysis of Low Impact Development (LID) and conservation best management practices that may help mitigate elevated temperatures and evapotranspiration on the Project site. A suitable analysis may consider for example, green or cool roof(s), opportunities for permeable paving or reduced hardscape, on-site storm water retention and/or filtration, shade trees, and water conservation measures.
- f. These comments are pursuant to City and County of Honolulu Directive 18-2 (July 16, 2018), and may be updated as needed.

3. Site Development Division:

- a. The Applicant shall address how the Project will comply with the Revised Ordinances of Honolulu (ROH) Chapter 21A (Flood Hazard Areas) as a portion of the property is within the floodway.
- b. The Applicant should address the Project's compliance with park dedication requirements.
- c. We have no objections to the proposed UHM campus student and faculty housing.

Please submit a Site Development Division Master Application Form for Sewer Connection.

- d. If the Project is categorized as Priority A, pursuant to the prevailing "Rules Relating to Water Quality" ("Rules"), then the Draft EA should include a narrative describing the Project's post-construction storm water quality strategic plan to comply with the Rules. The narrative should include a written description of the proposed development, expected activities and pollutants that will be generated by activities at the site, LID site design strategies that will be used to comply with the Rules and include a development schedule.



Further, a drainage report may be required. If required, the report shall, among other things, demonstrate compliance with the UHM Drainage Master Plan-January 2020 and the prevailing "Storm Drainage Standards" ("Standards").

- e. The Project's compliance with the Rules and Standards would be verified at the time that the grading/construction plans are submitted for review.
- f. Comments by the Traffic Review Branch will be provided upon review of the Draft EA and traffic study.

4. Building Division:

The Minor Modification to the PRU needs to address all areas of non-compliance with the Land Use Ordinance (LUO) as follows but not limited to:

- a. Height
- b. Height setbacks
- c. Yard setbacks
- d. Required parking stalls
- e. Required loading stalls
- f. Long and short term bicycle spaces.
- g. The type(s) of proposed commercial activity, e.g., retail, is allowed, either as an accessory to the campus or as its own principal use. If accessory or principal use, any restrictions/guidelines on signage?
- h. Any LUO or PRU required landscaping.
- i. All proposed modifications to the LUO development standards should be clearly disclosed in the PRU application.

Also, the Applicant must comply with ROH Chapter 21A Flood Hazard Areas and Park Dedication, if applicable.

Mr. Allen Kam  
June 12, 2020  
Page 5

We look forward to reviewing the Draft EA. Should you have any questions, please contact Gerald Toyomura, of our Urban Design Branch, at 768-8056.

Very truly yours,

  
for Kathy K. Sokugawa  
Acting Director

cc: Ms. Jan Gouveia, University of Hawaii, Vice President for Administration  
Mr. Ethan Thacher, Director of Development, Greystar



July 23, 2020  
2020.70.0200 / 20P-061

Ms. Kathy K. Sokugawa  
Acting Director  
City & County of Honolulu  
Department of Planning and Permitting  
650 South King Street, 7<sup>th</sup> Floor  
Honolulu, Hawai'i 96813

Dear Ms. Sokugawa:

**Response to Comments  
Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009**

Thank you for your letter dated June 12, 2020, commenting on the pre-consultation for the Draft Environmental Assessment (DEA) for the proposed University of Hawai'i Student and Faculty Multi-Family Housing project on the Mānoa campus. Please see our responses to your comments below:

**Land Use Permits Division**

**1. Proposal requires Minor Modification to Plan Review Use Permit (PRU) No. 2009/PRU-3. EA will need to be completed before the PRU can be processed.**

The EA will be completed prior to processing the PRU and explain how the project will comply with the requirements for a Minor Modification.

- a.** *Explain how proposed project will comply with requirements of R-5 Residential District and discuss any development standards that may need to be modified.*

A discussion of how the project complies with the requirements of the existing PRU permit, as modified will be included in the DEA, as these design standards would supersede those of R-5 Residential District.



**b.** *List all required permits.*

A list of all required permits will be included in the DEA.

**c.** *Include specific proposals pertaining to nearby bus stop, future location of a rail station and mechanisms to ensure pedestrian safety. Recommend keeping DOT Services and Honolulu Authority on Rapid Transit informed and involved with the project.*

There will be no changes to the bus stop or pedestrian facilities, such as cross walks. The sidewalk adjacent to the project may be closed during construction and redirected to the makai side of Dole Street.

Although a rail station was originally planned at the intersection of University Avenue and King Street, this proposal is currently not being pursued. However, if HART does pursue a station at the intersection in the future, the project will benefit from this new station.

**d.** *Discuss how proposed height of buildings compare to those nearby and impact neighborhood character. Include images showing how the project will impact neighboring views from the intersections of St. Luis Drive and Dole, and University and Dole.*

Buildings near the project include existing student and faculty houses such as Gateway Hall, Frear Hall, and Hale Mānoa which range in height from 11 to 13 stories. The project's proposed 12 to 18 stories would be similar in character and height to these existing buildings. A discussion of any possible impacts to the neighborhood character and images showing how the project may impact neighboring views from the specified intersections will be included in the DEA.

**e.** *Include materials associated with conversion of NOAA site including property history, current use, proposed project, and relationship to current PRU housing projects*

A historic architectural Reconnaissance Level Survey (RLS) is being prepared as part of the DEA process to determine the significance of the buildings at



the project site since they are more than 50 years old and the results will be included the DEA. The RLS survey form will be submitted to the State Historic Preservation Division (SHPD) as a part of Section 6E compliance.

*f. Impacts on neighboring views.*

Photo simulations of the proposed building will be included in the DEA that depict views from the St. Louis Drive/Dole Street intersection and from the University Avenue/Dole Street intersection.

### **Planning Division**

#### **1. Concerns about General Plan (GP) and Primary Urban Center Development Plan (PCU DP)**

The DEA will discuss how the project fulfills the applicable objectives, policies, long-term visions, and guidelines set forth in the GP and PUC DP.

#### **2. Addressing Climate Change Impacts**

The project will consider Leadership in Energy and Environmental Design (LEED) silver certified standards as guidelines in the design process. A discussion of Low Impact Development mitigation measures and other conservation Best Management Practices (BMPs) will be included in the DEA.

### **Site Development Division**

#### **1. Compliance with Revised Ordinances of Honolulu (ROH) Chapter 21A Flood Hazard Areas and park dedication requirements.**

Construction activities and development will be confined to Zone X areas outside of Mānoa Stream and the AE Zone area found onsite. Both temporary and permanent BMPs will be used to prevent construction related runoff from exiting the work area and entering the stream or AE zone. A discussion of BMPs implemented will be included in the DEA.

Park dedication requirements are not applicable to the proposed project. The University of Hawai'i Mānoa's (UHM) Long Range Development Plan (LRDP) and PRU permit (Resolution No. 09-341, CD1, FD1) however, focus on usable open spaces throughout the campus and provide a park-like feeling by incorporating

outdoor malls, plazas and mature tree canopy cover. The park-like feeling would not be impacted by the project.

**2. Project categorization of Priority A under Rules Relating to Water Quality (“Rules”) and drainage report.**

During construction, temporary BMPs will be used to control and minimize project related erosion and sedimentation and permanent post-construction BMPs, like detention basins or rain gardens, will be implemented to minimize future stormwater impacts. A discussion of both temporary and permanent BMPs selected will be included in the DEA.

**3. Site Development Division Master Application Form for Sewer Connection.**

A Site Development Division Master Application Form for Sewer Connection will be submitted.

**Building Division**

**1. The Minor Modification to address areas of non-compliance with the Land Use Ordinance (LUO).**

The Minor Modification to the PRU will address areas of non-compliance with the LUO as appropriate.

Thank you again for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the DEA. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam  
Director of Planning

cc: Ms. Jan Gouveia, University of Hawai‘i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar

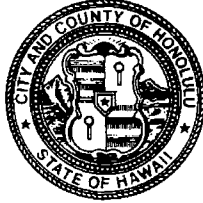
RECEIVED

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

2020 MAY 32 AM 11:16

BELT COLLINS HAWAII  
KIRK CALDWELL  
MAYOR



MICHELE K. NEKOTA  
DIRECTOR

JEANNE C. ISHIKAWA  
DEPUTY DIRECTOR

May 26, 2020

Mr. Allen Kam, Director of Planning  
Belt Collins Hawaii LLC  
2153 North King Street, Suite 200  
Honolulu, Hawaii 96819-4554

Dear Mr. Kam:

**SUBJECT:** Environmental Assessment-Pre-Consultation, University of Hawaii-  
Manoa Campus Student and Faculty Multi-Family Housing  
TMK: 2-8-023:009

Thank you for the opportunity to review and comment at the pre-consultation stage of the Environmental Assessment for the proposed subject of the University of Hawaii Student and Faculty Multi-Family housing project.

The Department of Parks and Recreation has no comment. As the proposed project will have no impact on any program or facility of the department, you may remove us as a consulted party to the balance of the EIS process.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Michele K. Nekota".

Michele K, Nekota  
Director

MKN:jr  
(813244)



July 23, 2020  
2020.70.0200 / 20P-057

Ms. Michele K. Nekota, Director  
City & County of Honolulu  
Dept. of Parks and Recreation  
1000 Uluohia Street, Suite 309  
Kapolei, Hawai'i 96707

Dear Ms. Nekota:

**Response to Comments**  
**Pre-Consultation for an Environmental Assessment**  
**Proposed University of Hawai'i-Mānoa Campus**  
**Student and Faculty Multi-Family Housing**  
**Tax Map Key: 2-8-023:009**

Thank you for your letter dated May 26, 2020, stating that the Department of Parks and Recreation does not have any pre-consultation comments on the Draft Environmental Assessment (DEA) for the proposed University of Hawai'i Student and Faculty Multi-Family Housing project on the Mānoa campus. As requested, your office will be removed from the consulted party list for the remainder of this environmental review process.

Thank you for participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the DEA. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,  
BELT COLLINS HAWAII LLC

Allen Kam  
Director of Planning

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethan Thacher, Director, Development, Greystar

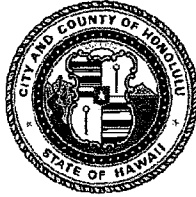




DEPARTMENT OF ENVIRONMENTAL SERVICES  
**CITY AND COUNTY OF HONOLULU**

1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707  
TELEPHONE: (808) 768-3486 • FAX: (808) 768-3487 • WEBSITE: <http://envhonolulu.org>

KIRK CALDWELL  
MAYOR



LORI M.K. KAHIKINA, P.E.  
DIRECTOR

TIMOTHY A. HOUGHTON  
DEPUTY DIRECTOR

ROSS S. TANIMOTO, P.E.  
DEPUTY DIRECTOR

IN REPLY REFER TO  
PRO 20-054

May 29, 2020

Mr. Allen Kam, Director of Planning  
Belt Collins Hawaii LLC  
2153 North King Street, Suite 200  
Honolulu, Hawaii 96819-4554

Dear Mr. Kam:

**SUBJECT:** Pre-Consultation for an Environmental Assessment, Proposed University of Hawaii-Manoa Campus, Student and Faculty Multi-Family Housing, 2570 Dole Street, TMK: 2-8-023:009, Honolulu, Oahu, Hawaii

We have reviewed your Pre-Assessment Consultation letter dated May 12, 2020. We have the following comments.

1. The proposed project site was not included in the UH Manoa 2007 Long Range Development Plan Update and therefore, was not included in the 2014 Draft UH Manoa Sewer Master Plan (see attachment).
2. Will the 2014 Draft UH Manoa Sewer Master Plan be updated to include the proposed project?

Should you have any questions, please call Lisa Kimura, Civil Engineer V, at (808) 768-3455 or email [lkimura1@honolulu.gov](mailto:lkimura1@honolulu.gov).

Sincerely,

Lori M.K. Kahikina, P.E.  
Director

Attachment

cc: DPP, SDD, Wastewater Branch

BELT COLLINS HAWAII

2020 JUN -2 PM 2:31

RECEIVED

DRAFT

---

# UNIVERSITY OF HAWAI'I AT MĀNOA SEWER MASTER PLAN

Honolulu, O'ahu, Hawai'i

TMK: 2-8-15: 01  
2-8-23: 03, 09, 13 & 16  
2-8-26:14  
2-8-29: 01  
2-9-04: 05  
2-9-23: 01 & 26  
3-3-56: 01

February 24, 2014

PREPARED FOR:

University of Hawai'i at Mānoa  
2500 Campus Road  
Honolulu, HI 96822



R. M. TOWILL CORPORATION  
SINCE 1930

2024 North King Street., Suite 200  
Honolulu, Hawai'i 96819-3494  
(808) 842-1133 • Fax: (808) 842-1937  
(RMTTC Ref: 1-21945-00)

---

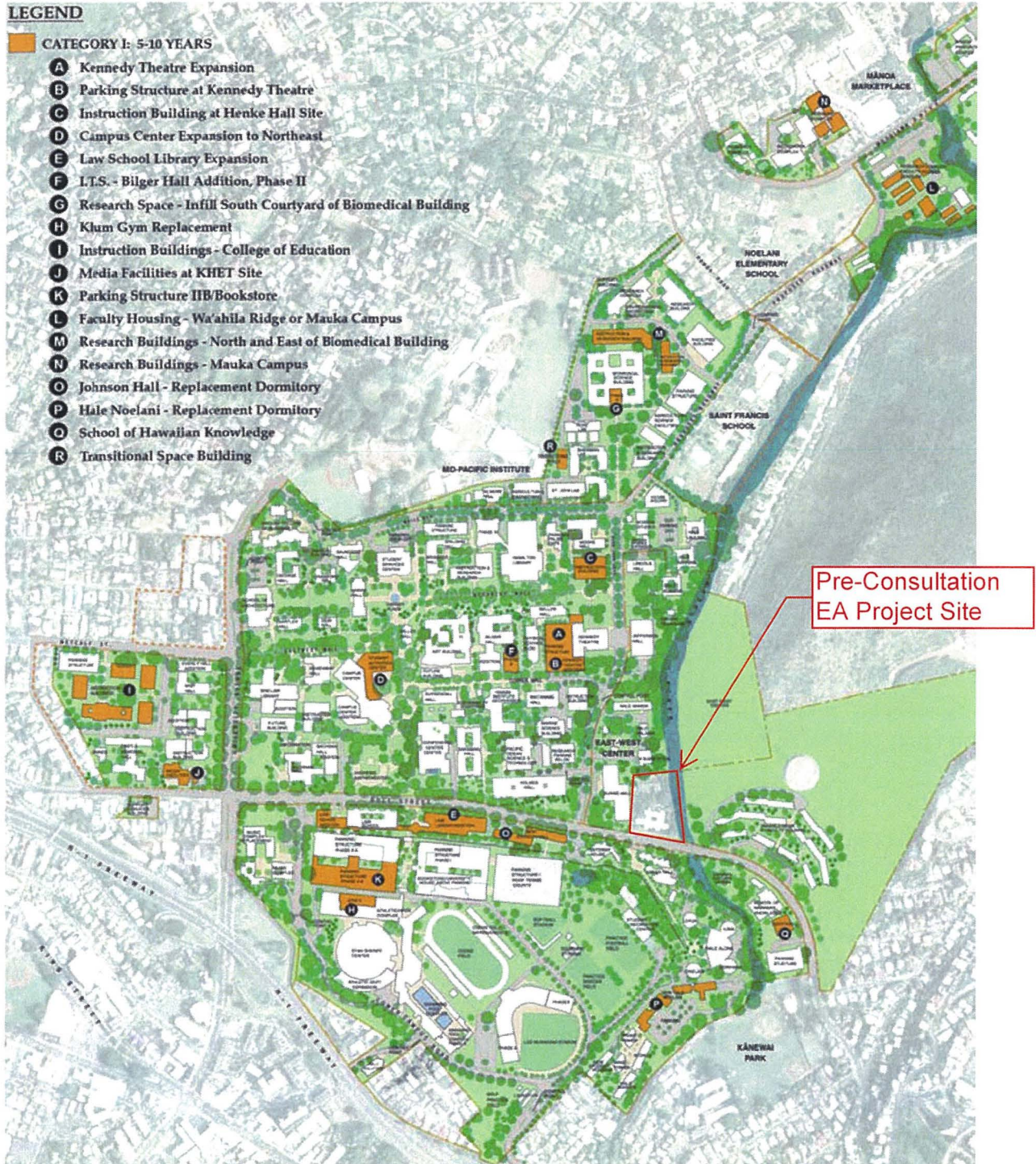


Figure 4-1: UH Mānoa 2007 LRDP Update Map



July 23, 2020  
2020.70.0200 / 20P-055

Ms. Lori M. K. Kahikina  
Director  
City & County of Honolulu  
Department of Environmental Services  
1000 Uluohia Street, Suite 308  
Kapolei, Hawai'i 96707

Dear Ms. Kahikina:

**Response to Comments  
Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009**

Thank you for your letter dated May 29, 2020, commenting on the pre-consultation for the Draft Environmental Assessment (DEA) for the proposed University of Hawai'i Student and Faculty Multi-Family Housing project on the Mānoa campus. Please see our responses to your comments below:

**1. Will the University of Hawai'i Draft 2014 Mānoa Sewer Master Plan be updated to include the proposed project?**

The University of Hawai'i will be updating their Mānoa Sewer Master Plan to include the proposed project.

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the DEA. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,  
BELT COLLINS HAWAII LLC

Allen Kam  
Director of Planning

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar





POLICE DEPARTMENT  
CITY AND COUNTY OF HONOLULU

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

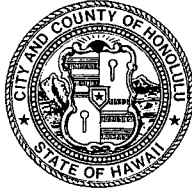
RECEIVED

2020 MAY 32 AM 11:16

BELT COLLINS HAWAII  
SUSAN BALLARD  
CHIEF

JOHN D. McCARTHY  
CLYDE K. HO  
DEPUTY CHIEFS

KIRK CALDWELL  
MAYOR



OUR REFERENCE EO-TS

May 27, 2020

Mr. Allen Kam  
Director of Planning  
Belt Collins Hawaii LLC  
2153 North King Street, Suite 200  
Honolulu, Hawaii 96819

Dear Mr. Kam:

This is in response to your request for comments on the Pre-Consultation, Draft Environmental Assessment, for the proposed University of Hawaii-Manoa Campus Student and Faculty Multi-Family Housing project located at 2570 Dole Street.

The Honolulu Police Department (HPD) anticipates short-term impacts to vehicular traffic around the project area. The HPD recommends that all necessary signs, lights, barricades, and other safety equipment be installed and maintained by the contractor during the construction phase of the project.

Additionally, the HPD would like to address public safety due to the increase in pedestrian and vehicular traffic around the proposed development. The HPD recommends implementing clearly defined crosswalks and brighter, more suitable lighting for the students, faculty, and their families during the evening hours. Lastly, due to the project's 400 residential units and additional retail component, the HPD has concerns with the security of the area when the project is completed.

If there are any questions, please call Major Joseph Trinidad of District 7 (East Honolulu) at 723-3369.

Thank you for the opportunity to review this project.

Sincerely,

A handwritten signature in black ink, appearing to read "Allan T. Nagata".

ALLAN T. NAGATA  
Assistant Chief of Police  
Support Services Bureau



July 23, 2020  
2020.70.0200 / 20P-064

Mr. Allen T. Nagata  
Assistant Chief of Police  
Support Services Bureau  
City & County of Honolulu  
Police Department  
801 South Beretania Street  
Honolulu, Hawai'i 96813

Dear Mr. Nagata:

**Response to Comments  
Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009**

Thank you for your letter dated May 27, 2020, commenting on the pre-consultation for the Draft Environmental Assessment (DEA) for the proposed University of Hawai'i Student and Faculty Multi-Family Housing project on the Mānoa campus. Please see our responses to your comments below:

**1. Short-term impacts to vehicular traffic during construction.**

To mitigate against any possible short-term impacts to traffic during the construction period, all necessary safety devices will be utilized and maintained by the contractor. These may include, but not be limited to, signs, lights, barricades, and/or clearly defined crosswalks.

**2. Public safety upon completion of project**

Efforts will be made to review and integrate adequate nighttime artificial light into the project design. Additional public safety measures may be implemented as necessary.

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the DEA. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,  
BELT COLLINS HAWAII LLC

Allen Kam  
Director of Planning

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar



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

June 8, 2020

Mr. Allen Kam  
Director of Planning  
Belt Collins Hawaii LLC  
2153 North King Street, Suite 200  
Honolulu, Hawaii 96819

RECEIVED  
2020 JUN 10 PM 12:56  
BELT COLLINS HAWAII

Dear Mr. Kam:

Subject: Preconsultation for an Environmental Assessment  
Proposed University of Hawaii at Manoa Campus Student and Multi-Family  
Housing  
2570 Dole Street  
Honolulu, Hawaii 96822  
Tax Map Key: 2-8-023: 009

In response to your letter dated May 12, 2020, 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 (46 meters) 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.)

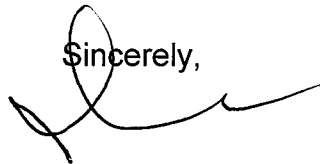
A fire department access road shall extend to within 50 feet (15 meters) of at least one exterior door that can be opened from the outside and that provides access to the interior of the building. (NFPA 1; 2012 Edition, Section 18.2.3.2.1.)

Mr. Allen Kam  
Page 2  
June 8, 2020

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 (45,720 millimeters) 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, Sections 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](mailto:wmasuda@honolulu.gov).

Sincerely,



JASON SAMALA  
Assistant Chief

JS/TC:bh





2153 NORTH KING STREET  
SUITE 200  
HONOLULU, HAWAII 96819  
  
TEL\_ 808.521.5361  
FAX\_ 808.538.7819  
  
BCHDESIGN.COM

July 23, 2020  
2020.70.0200 / 20P-063

Mr. Jason Samala  
Assistant Chief  
City & County of Honolulu  
Honolulu Fire Department  
636 South Street  
Honolulu, Hawai'i 96813

Dear Mr. Samala:

**Response to Comments  
Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009**

Thank you for your letter dated June 8, 2020, commenting on the pre-consultation for the Draft Environmental Assessment (DEA) for the proposed University of Hawai'i Student and Faculty Multi-Family Housing project on the Mānoa campus. Please see our responses to your comments below:

**1. Fire Department Access Road**

Fire access routes will be provided at the project site.

**2. Fire Protection**

The municipal water system will provide the project site with potable water and flow requirements for fire protection.

**3. Unobstructed width and vertical clearance**

The fire apparatus access road will meet City & County requirements and have unobstructed width and vertical clearances.

**4. Civil Drawings**

Upon completion, civil drawings will be submitted to the Honolulu Fire Department for review and approval. National Fire Protection Association requirements for Fire Department access and water supply will be reviewed and integrated into the project.

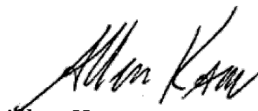


Mr. Jason Samala  
July 23, 2020 / 20P-063  
Page 2

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the DEA. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC

A handwritten signature in black ink that reads "Allen Kam". The signature is written in a cursive style with a large initial "A".

Allen Kam  
Director of Planning

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar

RECEIVED

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

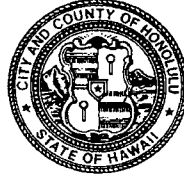
650 SOUTH KING STREET, 11<sup>TH</sup> FLOOR  
HONOLULU, HAWAII 96813

Phone: (808) 768-8480 • Fax: (808) 768-4567

Web site: [www.honolulu.gov](http://www.honolulu.gov)

2020 JUL 25 PM 1:42

BELT COLLINS HAWAII  
KIRK CALDWELL  
MAYOR



MARK YONAMINE, P.E.  
DIRECTOR

HAKU MILLES, P.E.  
DEPUTY DIRECTOR

June 19, 2020

Belt Collins Hawaii LLC  
ATTN: Allen Kam, Director of Planning  
2153 North King Street, Suite 200  
Honolulu, HI 96819-4554

Dear Mr. Kam,

Subject: Pre-Consultation for an Environmental Assessment Proposed University  
of Hawaii-Manoa Campus Student and Faculty Multi-Family Housing  
TMK: 2-8-023:009 2570 Dole Street Honolulu, Hawaii

Thank you for the opportunity to review and comment. The Department of Design  
and Construction does not have any comments at this time.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Yonamine".

FOR Mark Yonamine, P.E.  
Director



July 23, 2020  
2020.70.0200 / 20P-054

Mr. Mark Yonamine, P.E.  
Director  
City & County of Honolulu  
Dept. of Design and Construction  
650 South King Street, 11<sup>th</sup> Floor  
Honolulu, Hawai'i 96819

Dear Mr. Yonamine:

**Response to Comments  
Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009**

Thank you for your letter dated June 19, 2020, stating that the Department of Design and Construction does not have any pre-consultation comments on the Draft Environmental Assessment (DEA) for the proposed University of Hawai'i Student and Faculty Multi-Family Housing project on the Mānoa campus. Please see our responses to your comments below:

Thank you for participating in the HRS Chapter 343 environmental review process. Your letter was dated and received after the June 12, 2020 deadline. However, your letter and this response will still be included in the DEA. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC

A handwritten signature in black ink that reads "Allen Kam".

Allen Kam  
Director of Planning

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethan Thacher, Director, Development, Greystar







May 12, 2020  
2020.70.0200 / 20P-023

Ms. Suzanne Case, Chair  
State of Hawai'i  
Department of Land and Natural Resources  
1151 Punchbowl Street  
Honolulu, HI 96813

Dear Ms. Case:

**Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

On behalf of the University of Hawai'i-Mānoa (UHM), we wish to inform you that the UHM is proposing to develop a Multi-Family Student and Faculty Housing project on the Mānoa campus in Honolulu, O'ahu, Hawai'i. The location of the project is at the former National Oceanic and Atmospheric Administration (NOAA) offices located along Dole Street next to the Mānoa Stream (see Location Map). Under the existing Plan Review Use (PRU) permit (2009/PRU-3), the undeveloped housing square footage from Hale Noelani, Johnson Hall, and the Faculty Housing projects will be transferred to this former NOAA location. The purpose of this project is to fulfill the current demand for student and faculty housing in a location that provides nearby and easy access to the UHM campus facilities. Students and faculty will be able to walk to their classrooms rather than driving and enjoy the numerous amenities available on campus, such as dining, exercising, and recreation.

The project proposes to construct two buildings that will range from 12 to 18 stories in height with the first two floors dedicated to the childcare center, retail and circulation. The 3rd to 18th floors will contain the residential units. A total of 400 units are planned with a mix of studios, one-, two- and three-bedroom units. The existing childcare center located at Castle Memorial Hall at 2320 Dole Street will be relocated to this site when the development is completed. A small retail component of the project will service the new residents as well as other campus users. Limited vehicular parking will be provided because the residents will mainly be walking to the classrooms on campus. Bike share, UHM shuttle service, car share, The Bus, Uber and Lyft services will be available for travel to other nearby conveniences such as grocery shopping, restaurants, and other commercial businesses.



Ms. Suzanne Case  
May 12, 2020 / 20P-023  
Page 2

Pursuant to Chapter 343, Hawai'i Revised Statutes, an Environmental Assessment (EA) will be prepared for this project and subsequently made available for public review. If you wish to provide preliminary input on the project at this time or be a consulted party while the EA is being prepared, please review the attached maps and submit your written comments to the address below by June 12, 2020.

Belt Collins Hawai'i LLC  
2153 North King Street, Suite 200  
Honolulu, HI 96819-4554

Attention: Allen Kam, Director of Planning

Comments received during this period will be considered in the preparation of the Draft EA. When the Draft EA is completed, a copy will be sent to you for further review and input.

We thank you for your interest and participation in this project. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC

  
Allen Kam  
Director of Planning

JEH:gmk

Enclosures:

1. Figure 1: Location Map
2. Figure 2: Conceptual Site Plan

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar



May 12, 2020  
2020.70.0200 / 20P-023

Mr. Ernest Y. W. Lau, P.E.  
Manager/Chief Engineer  
Board of Water Supply  
630 South Beretania Street  
Honolulu, HI 96843

Dear Mr. Lau:

**Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

On behalf of the University of Hawai'i-Mānoa (UHM), we wish to inform you that the UHM is proposing to develop a Multi-Family Student and Faculty Housing project on the Mānoa campus in Honolulu, O'ahu, Hawai'i. The location of the project is at the former National Oceanic and Atmospheric Administration (NOAA) offices located along Dole Street next to the Mānoa Stream (see Location Map). Under the existing Plan Review Use (PRU) permit (2009/PRU-3), the undeveloped housing square footage from Hale Noelani, Johnson Hall, and the Faculty Housing projects will be transferred to this former NOAA location. The purpose of this project is to fulfill the current demand for student and faculty housing in a location that provides nearby and easy access to the UHM campus facilities. Students and faculty will be able to walk to their classrooms rather than driving and enjoy the numerous amenities available on campus, such as dining, exercising, and recreation.

The project proposes to construct two buildings that will range from 12 to 18 stories in height with the first two floors dedicated to the childcare center, retail and circulation. The 3rd to 18th floors will contain the residential units. A total of 400 units are planned with a mix of studios, one-, two- and three-bedroom units. The existing childcare center located at Castle Memorial Hall at 2320 Dole Street will be relocated to this site when the development is completed. A small retail component of the project will service the new residents as well as other campus users. Limited vehicular parking will be provided because the residents will mainly be walking to the classrooms on campus. Bike share, UHM shuttle service, car share, The Bus, Uber and Lyft services will be available for travel to other nearby conveniences such as grocery shopping, restaurants, and other commercial businesses.



Pursuant to Chapter 343, Hawai'i Revised Statutes, an Environmental Assessment (EA) will be prepared for this project and subsequently made available for public review. If you wish to provide preliminary input on the project at this time or be a consulted party while the EA is being prepared, please review the attached maps and submit your written comments to the address below by June 12, 2020.

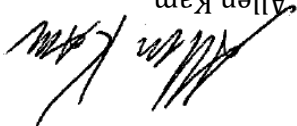
Belt Collins Hawai'i LLC  
2153 North King Street, Suite 200  
Honolulu, HI 96819-4554

Attention: Allen Kam, Director of Planning

Comments received during this period will be considered in the preparation of the Draft EA. When the Draft EA is completed, a copy will be sent to you for further review and input. We thank you for your interest and participation in this project. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC

  
Allen Kam  
Director of Planning

JEH:gmK

Enclosures:

1. Figure 1: Location Map
2. Figure 2: Conceptual Site Plan

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar





May 12, 2020  
2020.70.0200 / 20P-023

Mr. Ross S. Sasamura  
Director  
City & County of Honolulu  
Department of Facility Maintenance  
1000 Uluohia Street, Suite 215  
Kapolei, Hawaii 96707

Dear Mr. Sasamura:

**Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

On behalf of the University of Hawai'i-Mānoa (UHM), we wish to inform you that the UHM is proposing to development a Multi-Family Student and Faculty Housing project on the Mānoa campus in Honolulu, O'ahu, Hawai'i. The location of the project is at the former National Oceanic and Atmospheric Administration (NOAA) offices located along Dole Street next to the Mānoa Stream (see Location Map). Under the existing Plan Review Use (PRU) permit (2009/PRU-3), the undeveloped housing square footage from Hale Noelani, Johnson Hall, and the Faculty Housing projects will be transferred to this former NOAA location. The purpose of this project is to fulfill the current demand for student and faculty housing in a location that provides nearby and easy access to the UHM campus facilities. Students and faculty will be able to walk to their classrooms rather than driving and enjoy the numerous amenities available on campus, such as dining, exercising, and recreation.

The project proposes to construct two buildings that will range from 12 to 18 stories in height with the first two floors dedicated to the childcare center, retail and circulation. The 3rd to 18th floors will contain the residential units. A total of 400 units are planned with a mix of studios, one-, two- and three-bedroom units. The existing childcare center located at Castle Memorial Hall at 2320 Dole Street will be relocated to this site when the development is completed. A small retail component of the project will service the new residents as well as other campus users. Limited vehicular parking will be provided because the residents will mainly be walking to the classrooms on campus. Bike share, UHM shuttle service, car share, The Bus, Uber and Lyft services will be available for travel to other nearby conveniences such as grocery shopping, restaurants, and other commercial businesses.



Pursuant to Chapter 343, Hawai'i Revised Statutes, an Environmental Assessment (EA) will be prepared for this project and subsequently made available for public review. If you wish to provide preliminary input on the project at this time or be a consulted party while the EA is being prepared, please review the attached maps and submit your written comments to the address below by June 12, 2020.

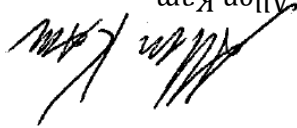
Belt Collins Hawai'i LLC  
2153 North King Street, Suite 200  
Honolulu, HI 96819-4554

Attention: Allen Kam, Director of Planning

Comments received during this period will be considered in the preparation of the Draft EA. When the Draft EA is completed, a copy will be sent to you for further review and input. We thank you for your interest and participation in this project. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam  
Director of Planning

JEH:gmk

Enclosures:

1. Figure 1: Location Map
2. Figure 2: Conceptual Site Plan

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar



May 12, 2020  
2020.70.0200 / 20P-023

Ms. Kathy K. Sokugawa  
Acting Director  
City & County of Honolulu  
Dept. of Planning and Permitting  
650 South King Street, 7th Floor  
Honolulu, HI 96813

Dear Ms. Sokugawa:

**Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

On behalf of the University of Hawai'i-Mānoa (UHM), we wish to inform you that the UHM is proposing to development a Multi-Family Student and Faculty Housing project on the Mānoa campus in Honolulu, O'ahu, Hawai'i. The location of the project is at the former National Oceanic and Atmospheric Administration (NOAA) offices located along Dole Street next to the Mānoa Stream (see Location Map). Under the existing Plan Review Use (PRU) permit (2009/PRU-3), the undeveloped housing square footage from Hale Noelani, Johnson Hall, and the Faculty Housing projects will be transferred to this former NOAA location. The purpose of this project is to fulfill the current demand for student and faculty housing in a location that provides nearby and easy access to the UHM campus facilities. Students and faculty will be able to walk to their classrooms rather than driving and enjoy the numerous amenities available on campus, such as dining, exercising, and recreation.

The project proposes to construct two buildings that will range from 12 to 18 stories in height with the first two floors dedicated to the childcare center, retail and circulation. The 3rd to 18th floors will contain the residential units. A total of 400 units are planned with a mix of studios, one-, two- and three-bedroom units. The existing childcare center located at Castle Memorial Hall at 2320 Dole Street will be relocated to this site when the development is completed. A small retail component of the project will service the new residents as well as other campus users. Limited vehicular parking will be provided because the residents will mainly be walking to the classrooms on campus. Bike share, UHM shuttle service, car share, The Bus, Uber and Lyft services will be available for travel to other nearby conveniences such as grocery shopping, restaurants, and other commercial businesses.



Pursuant to Chapter 343, Hawai'i Revised Statutes, an Environmental Assessment (EA) will be prepared for this project and subsequently made available for public review. If you wish to provide preliminary input on the project at this time or be a consulted party while the EA is being prepared, please review the attached maps and submit your written comments to the address below by June 12, 2020.

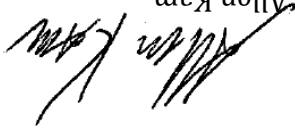
Belt Collins Hawai'i LLC  
2153 North King Street, Suite 200  
Honolulu, HI 96819-4554

Attention: Allen Kam, Director of Planning

Comments received during this period will be considered in the preparation of the Draft EA. When the Draft EA is completed, a copy will be sent to you for further review and input. We thank you for your interest and participation in this project. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam  
Director of Planning

JEH:gmk

Enclosures:

1. Figure 1: Location Map
2. Figure 2: Conceptual Site Plan

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar





May 12, 2020  
2020.70.0200 / 20P-023

Ms. Michele K. Nekota  
Director  
City & County of Honolulu  
Dept. of Parks and Recreation  
1000 Uluohia Street, Suite 309  
Kapolei, Hawaii 96707

Dear Ms. Nekota:

**Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

On behalf of the University of Hawai'i-Mānoa (UHM), we wish to inform you that the UHM is proposing to development a Multi-Family Student and Faculty Housing project on the Mānoa campus in Honolulu, O'ahu, Hawai'i. The location of the project is at the former National Oceanic and Atmospheric Administration (NOAA) offices located along Dole Street next to the Mānoa Stream (see Location Map). Under the existing Plan Review Use (PRU) permit (2009/PRU-3), the undeveloped housing square footage from Hale Noelani, Johnson Hall, and the Faculty Housing projects will be transferred to this former NOAA location. The purpose of this project is to fulfill the current demand for student and faculty housing in a location that provides nearby and easy access to the UHM campus facilities. Students and faculty will be able to walk to their classrooms rather than driving and enjoy the numerous amenities available on campus, such as dining, exercising, and recreation.

The project proposes to construct two buildings that will range from 12 to 18 stories in height with the first two floors dedicated to the childcare center, retail and circulation. The 3rd to 18th floors will contain the residential units. A total of 400 units are planned with a mix of studios, one-, two- and three-bedroom units. The existing childcare center located at Castle Memorial Hall at 2320 Dole Street will be relocated to this site when the development is completed. A small retail component of the project will service the new residents as well as other campus users. Limited vehicular parking will be provided because the residents will mainly be walking to the classrooms on campus. Bike share, UHM shuttle service, car share, The Bus, Uber and Lyft services will be available for travel to other nearby conveniences such as grocery shopping, restaurants, and other commercial businesses.



Pursuant to Chapter 343, Hawai'i Revised Statutes, an Environmental Assessment (EA) will be prepared for this project and subsequently made available for public review. If you wish to provide preliminary input on the project at this time or be a consulted party while the EA is being prepared, please review the attached maps and submit your written comments to the address below by June 12, 2020.

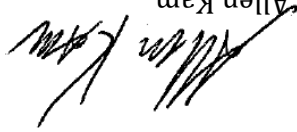
Belt Collins Hawai'i LLC  
2153 North King Street, Suite 200  
Honolulu, HI 96819-4554

Attention: Allen Kam, Director of Planning

Comments received during this period will be considered in the preparation of the Draft EA. When the Draft EA is completed, a copy will be sent to you for further review and input. We thank you for your interest and participation in this project. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam  
Director of Planning

JEH:gmK

Enclosures:

1. Figure 1: Location Map
2. Figure 2: Conceptual Site Plan

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar



May 12, 2020  
2020.70.0200 / 20P-023

Ms. Lori M. K. Kahikina  
Director  
City & County of Honolulu  
Dept. of Environmental Services  
1000 Uluohia Street, Suite 308  
Kapolei, Hawaii 96707

Dear Ms. Kahikina:

**Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

On behalf of the University of Hawai'i-Mānoa (UHM), we wish to inform you that the UHM is proposing to development a Multi-Family Student and Faculty Housing project on the Mānoa campus in Honolulu, O'ahu, Hawai'i. The location of the project is at the former National Oceanic and Atmospheric Administration (NOAA) offices located along Dole Street next to the Mānoa Stream (see Location Map). Under the existing Plan Review Use (PRU) permit (2009/PRU-3), the undeveloped housing square footage from Hale Noelani, Johnson Hall, and the Faculty Housing projects will be transferred to this former NOAA location. The purpose of this project is to fulfill the current demand for student and faculty housing in a location that provides nearby and easy access to the UHM campus facilities. Students and faculty will be able to walk to their classrooms rather than driving and enjoy the numerous amenities available on campus, such as dining, exercising, and recreation.

The project proposes to construct two buildings that will range from 12 to 18 stories in height with the first two floors dedicated to the childcare center, retail and circulation. The 3rd to 18th floors will contain the residential units. A total of 400 units are planned with a mix of studios, one-, two- and three-bedroom units. The existing childcare center located at Castle Memorial Hall at 2320 Dole Street will be relocated to this site when the development is completed. A small retail component of the project will service the new residents as well as other campus users. Limited vehicular parking will be provided because the residents will mainly be walking to the classrooms on campus. Bike share, UHM shuttle service, car share, The Bus, Uber and Lyft services will be available for travel to other nearby conveniences such as grocery shopping, restaurants, and other commercial businesses.



Pursuant to Chapter 343, Hawai'i Revised Statutes, an Environmental Assessment (EA) will be prepared for this project and subsequently made available for public review. If you wish to provide preliminary input on the project at this time or be a consulted party while the EA is being prepared, please review the attached maps and submit your written comments to the address below by June 12, 2020.

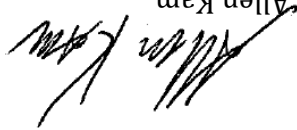
Belt Collins Hawai'i LLC  
2153 North King Street, Suite 200  
Honolulu, HI 96819-4554

Attention: Allen Kam, Director of Planning

Comments received during this period will be considered in the preparation of the Draft EA. When the Draft EA is completed, a copy will be sent to you for further review and input. We thank you for your interest and participation in this project. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC

  
Allen Kam  
Director of Planning

JEH:gmk

Enclosures:

1. Figure 1: Location Map
2. Figure 2: Conceptual Site Plan

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar





May 12, 2020  
2020.70.0200 / 20P-023

Mr. Robert J. Kroning, P.E.  
Director  
City & County of Honolulu  
Dept. of Design & Construction  
650 South King Street, 11th Floor  
Honolulu, HI 96813

Dear Mr. Kroning

**Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

On behalf of the University of Hawai'i-Mānoa (UHM), we wish to inform you that the UHM is proposing to development a Multi-Family Student and Faculty Housing project on the Mānoa campus in Honolulu, O'ahu, Hawai'i. The location of the project is at the former National Oceanic and Atmospheric Administration (NOAA) offices located along Dole Street next to the Mānoa Stream (see Location Map). Under the existing Plan Review Use (PRU) permit (2009/PRU-3), the undeveloped housing square footage from Hale Noelani, Johnson Hall, and the Faculty Housing projects will be transferred to this former NOAA location. The purpose of this project is to fulfill the current demand for student and faculty housing in a location that provides nearby and easy access to the UHM campus facilities. Students and faculty will be able to walk to their classrooms rather than driving and enjoy the numerous amenities available on campus, such as dining, exercising, and recreation.

The project proposes to construct two buildings that will range from 12 to 18 stories in height with the first two floors dedicated to the childcare center, retail and circulation. The 3rd to 18th floors will contain the residential units. A total of 400 units are planned with a mix of studios, one-, two- and three-bedroom units. The existing childcare center located at Castle Memorial Hall at 2320 Dole Street will be relocated to this site when the development is completed. A small retail component of the project will service the new residents as well as other campus users. Limited vehicular parking will be provided because the residents will mainly be walking to the classrooms on campus. Bike share, UHM shuttle service, car share, The Bus, Uber and Lyft services will be available for travel to other nearby conveniences such as grocery shopping, restaurants, and other commercial businesses.



Pursuant to Chapter 343, Hawai'i Revised Statutes, an Environmental Assessment (EA) will be prepared for this project and subsequently made available for public review. If you wish to provide preliminary input on the project at this time or be a consulted party while the EA is being prepared, please review the attached maps and submit your written comments to the address below by June 12, 2020.

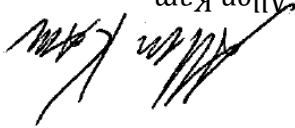
Belt Collins Hawai'i LLC  
2153 North King Street, Suite 200  
Honolulu, HI 96819-4554

Attention: Allen Kam, Director of Planning

Comments received during this period will be considered in the preparation of the Draft EA. When the Draft EA is completed, a copy will be sent to you for further review and input. We thank you for your interest and participation in this project. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam  
Director of Planning

JEH:gmk

Enclosures:

1. Figure 1: Location Map
2. Figure 2: Conceptual Site Plan

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar



May 12, 2020  
2020.70.0200 / 20P-023

Chief Susan Ballard  
City & County of Honolulu  
Honolulu Police Department  
801 South Beretania Street  
Honolulu, HI 96813

Dear Chief Ballard:

**Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

On behalf of the University of Hawai'i-Mānoa (UHM), we wish to inform you that the UHM is proposing to develop a Multi-Family Student and Faculty Housing project on the Mānoa campus in Honolulu, O'ahu, Hawai'i. The location of the project is at the former National Oceanic and Atmospheric Administration (NOAA) offices located along Dole Street next to the Mānoa Stream (see Location Map). Under the existing Plan Review Use (PRU) permit (2009/PRU-3), the undeveloped housing square footage from Hale Noelani, Johnson Hall, and the Faculty Housing projects will be transferred to this former NOAA location. The purpose of this project is to fulfill the current demand for student and faculty housing in a location that provides nearby and easy access to the UHM campus facilities. Students and faculty will be able to walk to their classrooms rather than driving and enjoy the numerous amenities available on campus, such as dining, exercising, and recreation.

The project proposes to construct two buildings that will range from 12 to 18 stories in height with the first two floors dedicated to the childcare center, retail and circulation. The 3rd to 18th floors will contain the residential units. A total of 400 units are planned with a mix of studios, one-, two- and three-bedroom units. The existing childcare center located at Castle Memorial Hall at 2320 Dole Street will be relocated to this site when the development is completed. A small retail component of the project will service the new residents as well as other campus users. Limited vehicular parking will be provided because the residents will mainly be walking to the classrooms on campus. Bike share, UHM shuttle service, car share, The Bus, Uber and Lyft services will be available for travel to other nearby conveniences such as grocery shopping, restaurants, and other commercial businesses.



Pursuant to Chapter 343, Hawai'i Revised Statutes, an Environmental Assessment (EA) will be prepared for this project and subsequently made available for public review. If you wish to provide preliminary input on the project at this time or be a consulted party while the EA is being prepared, please review the attached maps and submit your written comments to the address below by June 12, 2020.

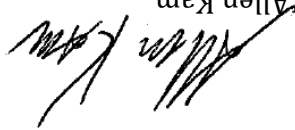
Belt Collins Hawai'i LLC  
2153 North King Street, Suite 200  
Honolulu, HI 96819-4554

Attention: Allen Kam, Director of Planning

Comments received during this period will be considered in the preparation of the Draft EA. When the Draft EA is completed, a copy will be sent to you for further review and input. We thank you for your interest and participation in this project. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC

  
Allen Kam  
Director of Planning

JEH:gmK

Enclosures:

1. Figure 1: Location Map
2. Figure 2: Conceptual Site Plan

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar





May 12, 2020  
2020.70.0200 / 20P-023

Chief Manuel P. Neves  
City & County of Honolulu  
Honolulu Fire Department  
636 South Street  
Honolulu, Hawaii 96813

Dear Chief Neves:

**Pre-Consultation for an Environmental Assessment  
Proposed University of Hawai'i-Mānoa Campus  
Student and Faculty Multi-Family Housing  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

On behalf of the University of Hawai'i-Mānoa (UHM), we wish to inform you that the UHM is proposing to develop a Multi-Family Student and Faculty Housing project on the Mānoa campus in Honolulu, O'ahu, Hawai'i. The location of the project is at the former National Oceanic and Atmospheric Administration (NOAA) offices located along Dole Street next to the Mānoa Stream (see Location Map). Under the existing Plan Review Use (PRU) permit (2009/PRU-3), the undeveloped housing square footage from Hale Noelani, Johnson Hall, and the Faculty Housing projects will be transferred to this former NOAA location. The purpose of this project is to fulfill the current demand for student and faculty housing in a location that provides nearby and easy access to the UHM campus facilities. Students and faculty will be able to walk to their classrooms rather than driving and enjoy the numerous amenities available on campus, such as dining, exercising, and recreation.

The project proposes to construct two buildings that will range from 12 to 18 stories in height with the first two floors dedicated to the childcare center, retail and circulation. The 3rd to 18th floors will contain the residential units. A total of 400 units are planned with a mix of studios, one-, two- and three-bedroom units. The existing childcare center located at Castle Memorial Hall at 2320 Dole Street will be relocated to this site when the development is completed. A small retail component of the project will service the new residents as well as other campus users. Limited vehicular parking will be provided because the residents will mainly be walking to the classrooms on campus. Bike share, UHM shuttle service, car share, The Bus, Uber and Lyft services will be available for travel to other nearby conveniences such as grocery shopping, restaurants, and other commercial businesses.



Pursuant to Chapter 343, Hawai'i Revised Statutes, an Environmental Assessment (EA) will be prepared for this project and subsequently made available for public review. If you wish to provide preliminary input on the project at this time or be a consulted party while the EA is being prepared, please review the attached maps and submit your written comments to the address below by June 12, 2020.

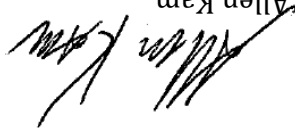
Belt Collins Hawai'i LLC  
2153 North King Street, Suite 200  
Honolulu, HI 96819-4554

Attention: Allen Kam, Director of Planning

Comments received during this period will be considered in the preparation of the Draft EA. When the Draft EA is completed, a copy will be sent to you for further review and input. We thank you for your interest and participation in this project. If you have any questions, please contact the undersigned at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC

  
Allen Kam  
Director of Planning

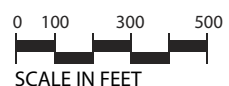
JEH:gmK

Enclosures:

1. Figure 1: Location Map
2. Figure 2: Conceptual Site Plan

cc: Ms. Jan Gouveia, University of Hawai'i, Vice President for Administration  
Mr. Ethen Thacher, Director, Development, Greystar





**Figure 1**  
**LOCATION MAP**  
UHM Multi-Family Project  
May 2020





Source: NAC Architecture



0 50 100 150  
SCALE IN FEET

### Figure 2 CONCEPTUAL SITE PLAN

UHM Multi-Family Project  
May 2020



# **APPENDIX G**

---

Draft EA Letters and Responses

September 15, 2020

Jan Gouveia  
Vice President for Administration  
University of Hawaii at Manoa  
Bachman Hall, Room 109H  
2444 Dole Street  
Honolulu, Hawaii 96822  
jgouveia@hawaii.edu

**RE: Draft Environmental Assessment (DEA) for the Mixed-Use Affordable Housing Project at the University of Hawaii at Manoa Campus**

Dear Ms. Gouveia,

While PRP supports the University of Hawaii's intent to build a new multi-family mixed-use rental housing project for graduate students and faculty at its Manoa campus, we also want to ensure that this project will create construction jobs for local residents who will be paid a "living wage" to enhance the quality of life for all residents in Hawaii.

The State of Hawaii is struggling to retain local jobs that pay middle-class wages, a situation that the pandemic has magnified. According to the latest ALICE data (2018), when combining households living beneath the FPL with ALICE households, an astonishing 42% of the State of Hawaii's population struggles to make ends meet with a budget that does not allow for savings without sacrificing other necessities, such as childcare, food, healthcare, and transportation. This data describes the economic reality before COVID-19. Given the economic uncertainty caused by COVID-19, the State needs to find ways to preserve and protect jobs and wages to mitigate the impacts that this crisis will continue to have on the State's residents.

Hawaii's construction industry plays a vital role in stimulating the local economy and improving the overall quality of life for Hawaii's residents. The industry has been fortunate to continue operating during the pandemic, but it and its workers will not be immune to the impacts from the faltering economy. The economic impact of COVID-19 on Hawaii has been broad and destructive. In order to help Hawaii's residents and businesses recover from this pandemic, the State must find ways to ensure that taxpayer dollars and state lands are used wisely through public-private partnerships. This can be achieved by ensuring that construction contractors hire a local workforce and pay them prevailing wages pursuant to Chapter 104, Hawaii Revised Statutes.

Please confirm whether construction of the project will be subject to Hawaii's prevailing wage law, as is required by HRS 104-2(a)(2). We ask that you also confirm whether contractors participating in



**(Continued From Page 1)**

construction of the project will be subject to Hawaii's law regarding employment of state residents on construction procurement contracts, as described in HRS 103B.

We also recognize the DEA's estimation that the total project cost is anticipated to be \$85 million. We would request that the Final Environmental Assessment include more details on the direct and indirect jobs and estimated construction wages that may be created by this project.

Thank you for this opportunity to submit written comments.

Sincerely,

*Chris Delaunay*

Christopher Delaunay  
Government Relations Manager



March 15, 2021  
2020.70.0200 / 21P-008

Mr. Christopher Delaunay  
Government Relations Manager  
Pacific Resource Partnership  
1100 Alakea Street, 4<sup>th</sup> Floor  
Honolulu, Hawai'i 96813

Dear Mr. Delaunay:

**Response to Comments  
Draft Environmental Assessment (DEA)  
Mixed-Use Affordable Housing Project at the  
University of Hawai'i at Manoa Campus  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

Thank you for your letter dated September 15, 2020, in response to the subject DEA—Anticipated Finding of No Significant Impact for the proposed Mixed-Use Affordable Housing Project at the University of Hawai'i at Mānoa Campus; which is being renamed in the Final EA as the Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus. The name is being revised to better reflect the project and avoid confusion regarding the term “affordable”, as the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty. The rental units are not for the general public nor will they be income restricted.

The DEA was originally published in the Office of Environmental Quality Control's September 08, 2020, issue of the *Environmental Notice* and republished in the October 23, 2020, issue to extend the public comment period. Your review of the DEA and participation in the review process is most appreciated. Please see our response to your comments below.

**1. Prevailing wage law requirements and employment of State residents.**

The Proposed Action will be constructed in accordance with all applicable legal requirements, including Hawai'i's prevailing wage and labor laws.





**2. Potential job creation and economic growth created by the Proposed Action.**

We acknowledge your request to include additional details in the Final EA regarding potential direct and indirect job creation and estimated construction wages that may be generated by the Proposed Action. As discussed in the DEA, the Proposed Action is consistent with State and County Plans regarding positive economic growth and employment generation.

The purpose of HRS Chapter 343 is to assess and analyze the scope of potential impacts a project may create as early as possible in the design process. As such, a finalized design is not complete for the Proposed Action. Any additional analysis of potential economic growth or job creation beyond that already described in the DEA would be dependent on the final design.

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the forthcoming Final EA. If you have any questions, please contact me at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam

Director of Planning

AK:kc

cc: Mr. Ethen Thacher, Director, Development, Greystar  
Ms. Jan Gouveia, Vice President for Administration, University of Hawaii

## Umeyo Momotaro

---

**From:** Allen Kam  
**Sent:** Monday, November 23, 2020 4:20 PM  
**To:** Sarah Harris; Umeyo Momotaro  
**Subject:** Fwd: OHA Comment Re: DEA for UH Mixed Use Affordable Housing

**Categories:** Planning

Sent from my iPhone

Begin forwarded message:

**From:** Kamakana Ferreira <kamakanaf@oha.org>  
**Date:** November 23, 2020 at 2:52:14 PM HST  
**To:** Allen Kam <akam@bchdesign.com>  
**Subject: OHA Comment Re: DEA for UH Mixed Use Affordable Housing**

Aloha e Allen,

Below are comments from the Office of Hawaiian Affairs (OHA) regarding the republished August 2020 draft environmental assessment (DEA) for the proposed Mixed Use Affordable Housing project at the University of Hawai'i-Mānoa Campus in Honolulu, O'ahu, TMK (1)2-8-023:009. While the DEA was originally published for public comment on September 8, the University of Hawai'i at Mānoa (UH) has elected to allow a second public comment period. Mahalo for this opportunity.

Belt Collins Hawaii, LLC., has prepared the DEA on behalf of the UH, pursuant to Hawai'i Revised Statutes (HRS) 343. The proposed action is described as a multi-family mixed-use rental housing project for graduate students and faculty. Three existing structures behind the UH East-West Center will be demolished and a new building (with 400 housing units) to include two adjoining towers connected by a 2-story podium will be constructed. UH anticipates a finding of no significant impact (FONSI).

OHA's comments pertain to HRS 6E (historic preservation review) compliance and cultural resources. These comments will also be provided in a formal letter.

### **HRS 6E Compliance**

The DEA indicates an archaeological literature review and field inspection report (ALRFI) was completed for this project in 2020 by Scientific Consulting Services, Inc., (SCS) in preparation of HRS 6E, historic preservation review. As the ALRFI indicates that human burials and agricultural subsurface deposits have been found in nearby areas, an archaeological inventory survey (AIS) and consultation with the State Historic Preservation Division (SHPD) is being recommended for the project by SCS. While HRS 6E review is apparently not completed yet, OHA supports this recommendation to do an AIS and notes that SHPD review of the project is required by HRS 6E for any project action that requires a permit.

Procedurally, OHA maintains that completing the HRS 6E review after the DEA robs the HRS 343 process of the intent to fully consider environmental impacts and contradicts what is required by Hawai'i Administrative Rules (HAR) 11-200.1. The intent of HRS Chapter 343 is to ensure a project's impact to

the environment is fully considered in the planning process and to integrate mitigation where needed to minimize significant environmental harm. HAR 11-200.1-18(d)(8) requires that proposed mitigations be included within the DEA. In determining whether historic properties will be adversely impacted, the HRS 6E review process is essential to identifying sites and generating mitigation commitments in consultation with SHPD. Typically, any resulting mitigations made during the HRS 6E review process are included in the DEA.

If historic properties are identified at a later time and recommended mitigations (i.e., preservation, data recovery) are yet to be determined, the DEA cannot possibly be complete as required by the HARs. OHA thus questions the completeness of the DEA and the FONSI determination. Deferring the HRS 6E review process at this point hides possible adverse impacts and mitigations from being included in the DEA, thus skewing the FONSI determination and limiting the public's chance to comment. The precedence set by this decision would go against the way DEA's are typically done in the State of Hawai'i and potentially encourage other projects to do HRS 6E reviews after a DEA is complete. OHA cannot support this course action.

### **Cultural Resources**

In review of the DEA, it appears that there has been no dedicated analysis of cultural impacts for this project. The DEA simply states that there will be no impact to traditional and cultural practices as there are no known sacred sites or cultural sites occurring on-site. However, the DEA does state that Best Management Practices (BMP) will be utilized to protect the Mānoa Stream and to avoid impacts to the nearby-downstream Ka Papa Lo'i o Kānewai. This seems to imply that cultural practices occurring offsite at Ka Papa Lo'i o Kānewai could be impacted indirectly. Typically, the scope of a cultural impact analysis is to be greater than the area over which the proposed action will take place.

Piliāmo'o is both the name of the land area near Kānewai, as well as the name of a mo'o which inhabits the vicinity of Ka Papa Lo'i o Kānewai and portions of the Mānoa Stream in your project area, which runs both above-ground and below-ground. This information has been provided by Edward Makahiapo Cashman, Direct of Ka Papa Lo'i o Kānewai. The existence of subterranean waterways is documented in Mānoa and in Mo'ili'ili in both lava tubes and karsts. They are known to contain both ancestral burials and artifacts of cultural and religious significance.

Pursuant to HRS 343 and HAR 11-200.1-13, the project proponent must determine whether the effects of a proposed action constitute a significant effect, which includes identifying effects to the cultural component of the affected environment. While recent amendments to the HARs that govern environmental rules do allow for prior analyses that were included in old DEAs to be used again in different projects,<sup>[1]</sup> there is no reference to any study or prior cultural impact analysis in the DEA's discussion on cultural resources. As evident in the DEA's admission to there being possible impacts to the Ka Papa Lo'i o Kānewai, it appears further analysis and mitigation is warranted.

Guidelines for assessing cultural impacts are provided by the Office of Environmental Quality Control (OEQC) in the *Guide to Implementation and Practice of the Hawaii Environmental Policy Act*, Exhibit 1-1, 2012 Edition. Of relevance to this particular situation, these guidelines require an analysis of cultural practices and resources located within "the broad geographical area in which the proposed project is located, as well as their direct or indirect significance or connection to the project site." We encourage UH to complete a cultural analysis or cultural impact assessment (CIA) that is compliant with these guidelines and minimally reach out to the caretakers of Ka Papa Lo'i o Kānewai and the Hawai'inuiākea School of Hawaiian Knowledge.

OHA would further like to remind UH that any State or County agency that grants a permit related to this project has a responsibility to reasonably protect traditional and customary Native Hawaiian rights

as required by Articles IX and XII of the State of Hawai'i Constitution. Article XII Section 7 of the State of Hawai'i Constitution states:

“the State reaffirms and shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by ahupua'a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778...”

In *Ka Pa'akai O Ka 'Aina v. Land Use Commission*, 94 Haw. 31 (2000), hereinafter *Ka Pa'akai*, the Hawai'i Supreme Court, reiterated the importance of Section 7 and reaffirmed that the State and its agencies, inclusive of the Counties, are obligated to reasonably protect the traditional and customary rights of Hawaiians.

The *Ka Pa'akai* court decision set forth that a proper analysis of cultural impacts shall include: 1) the identity and scope of valued cultural, historical, or natural resources in the subject area, including the extent to which traditional and customary native Hawaiian rights are exercised; 2) the extent to which those resources – including traditional and customary native Hawaiian rights – will be affected or impaired by the proposed action; and, 3) the feasible action, if any, to be taken by the (agency) to reasonably protect native Hawaiian rights if they are found to exist. While the construct for CIAs and cultural impact studies done as part of the HRS 343 process have often been used to assist State or County agencies with meeting *Ka Pa'akai* requirements, there is no dedicated cultural analysis or reference to any prior study for this particular project in regard to cultural resources.

#### **Closing Remarks**

Mahalo for the opportunity to comment. OHA looks forward to seeing our comments pertaining to HRS 6E compliance and cultural resources addressed. More importantly, we hope the voices of Native Hawaiians are heard and identified cultural practices are protected. Should you have any questions, please contact OHA's Lead Compliance Specialist, Kamakana C. Ferreira at (808) 594-0227 or by email at [kamakanaf@oha.org](mailto:kamakanaf@oha.org).

Mahalo,  
*Kamakana C. Ferreira, M.A.*  
Lead Compliance Specialist  
Office of Hawaiian Affairs  
560 N. Nimitz Hwy  
Honolulu, Hi. 96817

(808)594-0227

---

This email has been scanned for spam and viruses by Proofpoint Essentials. Click [here](#) to report this email as spam.

---

<sup>[1]</sup> See HAR 11-200.1-12, Consideration of previous determinations and accepted statements.





**STATE OF HAWAII**  
**OFFICE OF HAWAIIAN AFFAIRS**  
560 N. NIMITZ HWY., SUITE 200  
HONOLULU, HAWAII 96817

RECEIVED

2020 DEC -3 AM 1:28

BELT COLLINS HAWAII

HRD20-9299

November 16, 2020

Allen Kam  
Director of Planning  
Belt Collins Hawaii LLC.  
2153 North King Street, Suite 200  
Hilo, HI 96819

Re: Draft Environmental Assessment  
Mixed Use Affordable Housing at the University of Hawai'i-Mānoa Campus  
Waikīkī Ahupua'a, Honolulu (Kona) Moku, O'ahu Moku  
Tax Map Key: (1) 2-8-023:009

Aloha e Mr. Kam:

The Office of Hawaiian Affairs (OHA) is in receipt of your letter dated October 20, 2020 inviting us to comment on the republished August 2020 draft environmental assessment (DEA) for the proposed Mixed Use Affordable Housing project at the University of Hawai'i-Mānoa Campus in Honolulu, O'ahu, being released for public comment on October 23. While the DEA was originally published for public comment on September 8, the University of Hawai'i at Mānoa (UH) has elected to allow a second public comment period. Belt Collins Hawaii, LLC., has prepared the DEA on behalf of the UH, pursuant to Hawai'i Revised Statutes (HRS) 343.

The proposed action is described as a multi-family mixed-use rental housing project for graduate students and faculty. Three existing structures behind the UH East-West Center will be demolished and a new building (with 400 housing units) to include two adjoining towers connected by a 2-story podium will be constructed. UH anticipates a finding of no significant impact (FONSI). OHA provides the following comments regarding HRS 6E (historic preservation review) compliance and impact to cultural resources.

**HRS 6E Compliance**

The DEA indicates an archaeological literature review and field inspection report (ALRFI) was completed for this project in 2020 by Scientific Consulting Services, Inc., (SCS) in preparation of HRS 6E, historic preservation review. As the ALRFI indicates that

Allen Kam

DEA – Mixed Use Affordable Housing at the University of Hawai‘i-Mānoa Campus

November 16, 2020

Page 2 of 4

human burials and agricultural subsurface deposits have been found in nearby areas, an archaeological inventory survey (AIS) and consultation with the State Historic Preservation Division (SHPD) is being recommended for the project by SCS. While HRS 6E review is apparently not completed yet, OHA supports this recommendation to do an AIS and notes that SHPD review of the project is required by HRS 6E for any project action that requires a permit.

Procedurally, OHA maintains that completing the HRS 6E review after the DEA robs the HRS 343 process of the intent to fully consider environmental impacts and contradicts what is required by Hawai‘i Administrative Rules (HAR) 11-200.1. The intent of HRS Chapter 343 is to ensure a project’s impact to the environment is fully considered in the planning process and to integrate mitigation where needed to minimize significant environmental harm. HAR 11-200.1-18(d)(8) requires that proposed mitigations be included within the DEA. In determining whether historic properties will be adversely impacted, the HRS 6E review process is essential to identifying sites and generating mitigation commitments in consultation with SHPD. Typically, any resulting mitigations made during the HRS 6E review process are included in the DEA.

If historic properties are identified at a later time and recommended mitigations (i.e., preservation, data recovery) are yet to be determined, the DEA cannot possibly be complete as required by the HARs. OHA thus questions the completeness of the DEA and the FONSI determination. Deferring the HRS 6E review process at this point hides possible adverse impacts and mitigations from being included in the DEA, thus skewing the FONSI determination and limiting the public’s chance to comment. The precedence set by this decision would go against the way DEA’s are typically done in the State of Hawai‘i and potentially encourage other projects to do HRS 6E reviews after a DEA is complete. OHA cannot support this course action.

### **Impact to Cultural Resources**

In review of the DEA, it appears that there has been no dedicated analysis of cultural impacts for this project. The DEA simply states that there will be no impact to traditional and cultural practices as there are no known sacred sites or cultural sites occurring on-site. However, the DEA does state that Best Management Practices (BMP) will be utilized to protect the Mānoa Stream and to avoid impacts to the nearby-downstream Ka Papa Lo‘i o Kānewai. This seems to imply that cultural practices occurring offsite at Ka Papa Lo‘i o Kānewai could be impacted indirectly. Typically, the scope of a cultural impact analysis is to be greater than the area over which the proposed action will take place.

Pursuant to HRS 343 and HAR 11-200.1-13, the project proponent must determine whether the effects of a proposed action constitute a significant effect, which includes identifying effects to the cultural component of the affected environment. While recent amendments to the HARs that govern environmental rules do allow for prior analyses that

were included in old DEAs to be used again in different projects,<sup>1</sup> there is no reference to any study or prior cultural impact analysis in the DEA’s discussion on cultural resources. As evident in the DEA’s admission to there being possible impacts to the Ka Papa Lo‘i o Kānewai, it appears further analysis and mitigation is warranted.

Guidelines for assessing cultural impacts are provided by the Office of Environmental Quality Control (OEQC) in the *Guide to Implementation and Practice of the Hawaii Environmental Policy Act*, Exhibit 1-1, 2012 Edition. Of relevance to this particular situation, these guidelines require an analysis of cultural practices and resources located within “the broad geographical area in which the proposed project is located, as well as their direct or indirect significance or connection to the project site.” We encourage UH to complete a cultural analysis or cultural impact assessment (CIA) that is compliant with these guidelines and minimally reach out to the caretakers of Ka Papa Lo‘i o Kānewai and the Hawai‘inuiākea School of Hawaiian Knowledge.

OHA would further like to remind UH that any State or County agency that grants a permit related to this project has a responsibility to reasonably protect traditional and customary Native Hawaiian rights as required by Articles IX and XII of the State of Hawai‘i Constitution. Article XII Section 7 of the State of Hawai‘i Constitution states:

“the State reaffirms and shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by ahupua‘a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778...”

In *Ka Pa‘akai O Ka ‘Aina v. Land Use Commission*, 94 Haw. 31 (2000), hereinafter *Ka Pa‘akai*, the Hawai‘i Supreme Court, reiterated the importance of Section 7 and reaffirmed that the State and its agencies, inclusive of the Counties, are obligated to reasonably protect the traditional and customary rights of Hawaiians.

The *Ka Pa‘akai* court decision set forth that a proper analysis of cultural impacts shall include: 1) the identity and scope of valued cultural, historical, or natural resources in the subject area, including the extent to which traditional and customary native Hawaiian rights are exercised; 2) the extent to which those resources – including traditional and customary native Hawaiian rights – will be affected or impaired by the proposed action; and, 3) the feasible action, if any, to be taken by the (agency) to reasonably protect native Hawaiian rights if they are found to exist. While the construct for CIAs and cultural impact studies done as part of the HRS 343 process have often been used to assist State or County agencies with meeting *Ka Pa‘akai* requirements, there is no dedicated cultural analysis or reference to any prior study for this particular project in regard to cultural resources.

---

<sup>1</sup> See HAR 11-200.1-12, Consideration of previous determinations and accepted statements.

Allen Kam  
DEA – Mixed Use Affordable Housing at the University of Hawai‘i-Mānoa Campus  
November 16, 2020  
Page 4 of 4

### **Closing Remarks**

Mahalo for the opportunity to comment. OHA looks forward to seeing our comments pertaining to HRS 6E compliance and impact to cultural resources addressed. More importantly, we hope the voices of Native Hawaiians are heard and identified cultural practices are protected. Should you have any questions, please contact OHA’s Lead Compliance Specialist, Kamakana C. Ferreira at (808) 594-0227 or by email at [kamakanaf@oha.org](mailto:kamakanaf@oha.org).

‘O wau iho nō me ka ‘oia ‘i‘o,

Sylvia M. Hussey, Ed.D.  
Ka Pouhana, Chief Executive Officer

SH:kf

**Signature:** *Casey Brown*

**Email:** [caseyb@oha.org](mailto:caseyb@oha.org)





March 15, 2021  
2020.70.0200 / 21P-009

Ms. Sylvia M. Hussey  
Ka Pouhana, Chief Executive Officer  
Office of Hawaiian Affairs  
560 North Nimitz Highway  
Honolulu, Hawai'i 96817

Dear Ms. Hussey:

**Response to Comments  
Draft Environmental Assessment  
Mixed-Use Affordable Housing Project at the  
University of Hawai'i at Mānoa Campus  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

Thank you for the Office of Hawaiian Affairs' (OHA's) email dated November 23, 2020, in response to the subject DEA—Anticipated Finding of No Significant Impact for the proposed Mixed-Use Affordable Housing Project at the University of Hawai'i at Mānoa Campus which is being renamed in the Final EA to the Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus. The name is being revised to better reflect the project and avoid confusion regarding the term “affordable”, as the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty. The rental units are not for the general public nor will they be income restricted.

The Draft EA was originally published in the Office of Environmental Quality Control's September 08, 2020, issue of the *Environmental Notice* and republished in the October 23, 2020, issue to extend the public comment period. We greatly appreciate your review and comments. Please see our response to your comments below.

With respect to your specific procedural concerns about HRS Chapter 6E, HRS Chapter 343 does not require completion of Chapter 6E review before completing the Draft EA. Chapter 343 establishes a system of environmental review to ensure that environmental concerns are given appropriate consideration in the decision-making process, along with economic and technical considerations. As part of the environmental review process, the content requirements for an EA are established as part of Hawai'i Administrative Rules (HAR) Chapter 11-200.1 (Environmental Impact Statement Rules).



HAR § 11-200.1-18(d)(5) and (8), states that an EA should include a “[g]eneral description of the action's technical, economic, social, cultural, historical, and environmental characteristics”; and “[p]roposed mitigation measures.”

We appreciate OHA’s procedural comments, however, Chapter 343, applicable administrative rules, and case law do not require conclusion of Chapter 6E process to have an adequate environmental document. In Kaleikini v. Yoshioka, 283 P.3d 60, 128 Haw. 53 (2012), the Hawai’i Supreme Court stated, “proposals for the preservation of specific historic property, including burials, are not a per se requirement in an EIS.” In addition, the court stated, “the need for an AIS to adequately identify and protect specific native Hawaiian burials . . . are addressed under HRS Chapter 6E, rather than HRS Chapter 343.” In addition, we note that Section 3.3.1 of the Draft EA acknowledges the “potential for subsurface archaeological deposits to be present,” and therefore recommends that an AIS be conducted for the project site, in consultation with SHPD in the context of HRS Chapter 6E.

In regard to OHA’s comments about the “Cultural Resources,” although a cultural impact assessment (CIA) was not attached to the Draft EA, the Draft EA is in compliance with Ka Pa’akai v. Land Use Commission, 94 Haw. 31 (2000) for the following reasons.

First, the Draft EA identifies the valued cultural, historical, and natural resources in and within the vicinity of the proposed Project site. Section three of the Draft EA, entitled *Historic, Archaeological and Cultural Resources*, bases its conclusions on detailed source documents. The *Archaeological Literature Review and Field Inspection* (ALRFI) was completed for the Project in 2020 and is attached as Appendix C to the DEA.

The ALRFI provides greater details of the Project site. The Project site is within the Ahupua’a of Waikīkī and adjacent to Mānoa Stream. During the Pre-Contact Period, much of Mānoa Valley was in kalo cultivation then it shifted to rice cultivation. Makai of the Project site in Mō’ili’ili, there was a quarry. However, by 1953, the University of Hawai’i had developed most of the area, including lands adjacent to the Project site. In the 1950’s, the National Oceanic and Atmospheric Administration, National Marine Fisheries Service constructed their building complex and occupied the area until their departure, after which the property was conveyed back to the University of Hawai’i at Mānoa (UHM) in 2015.

Appendix C also includes Land Commission Award No. 1748 awarded on October 25, 1849, to Ono as a house lot with three houses and a fence, and it references Kānewai and the stream. Although no valued cultural, historical, or natural resources were identified on the Project site, Mānoa Stream and Kānewai lo’i were identified as traditional and contemporary resources for continued traditional and customary practices related to lo’i kalo.

Second, Mānoa Stream and Ka Papa Lo'i 'o Kānewai are not directly impacted by the Proposed Action but the Draft EA identified the extent to which Mānoa Stream and Kānewai lo'i could be impacted by the proposed Project. In addition to the ALRFI that was completed in 2020, Cultural Surveys Hawai'i completed a CIA in 2008 (CSH's CIA) for UHM's Long Range Development Plan (LRDP) Project which was a source material in preparing the Draft EA. CSH's CIA included community consultation and a site visit with Makahiapo (Hiapo) Cashman, Director of the Ka Papa Lo'i 'o Kānewai. Similarly, members of this Project Team conducted a site visit and talk-story with Hiapo Cashman who reiterated the importance of maintaining consistent water quality and flow from Mānoa Stream located directly below the Project site. Mānoa Stream flows into the Kānewai lo'i that sustains the lo'i kalo and continues to flow out to Ala Wai. Hiapo also shared that there are regularly scheduled community workdays at Kānewai lo'i. Dr. Jon Osorio, Dean of Hawai'i inuiākea School of Hawaiian Knowledge, was invited to the site visit but was unable to join. The CSH CIA has been included as Appendix H in the forthcoming Final EA, and Section 3.2 of the Final EA references CSH CIA.

Finally, the Draft EA identifies "feasible action" or mitigation measures to be taken to protect the water quality and flow from Mānoa Stream to Kānewai lo'i. The proposed mitigation measures include the following:

- Section 2.3.3.1 related to soils. In addition to City ordinances, the Developer is required to comply with SHPD requirements for archaeological monitoring, during all excavation and grading activities;
- Section 2.4.3.1 related to surface water. Pursuant to avoiding any adverse impacts to Mānoa Stream, as additional mitigation, the Developer is required to coordinate with Ka Papa Lo'i 'o Kānewai to monitor the water quality of Mānoa Stream entering the lo'i;
- Section 3.2.1 related to cultural resources. To avoid impacts on Mānoa Stream that could affect Ka Papa Lo'i 'o Kānewai, the Developer's Development Team and General Contractor shall participate in a Ka Papa Lo'i 'o Kānewai community workday. This mitigation measure is not only to avoid physical impacts to Kānewai lo'i, but just as important is to ensure cultural education and sensitivity to the kuleana to mālama that very important cultural resource; and
- Section 3.3.1 related to archaeological resources. Iwi Kūpuna have not been discovered within the Project site but have been discovered in the vicinity of the Project, therefore, the developer shall consult with SHPD to determine if an AIS shall be done prior to or after demolition of the existing buildings.

Ms. Hussey  
March 15, 2021/21P-009  
Page 3

In addition to the above, the list of cultural stakeholders in the Final EA will be updated to include Ka Papa Lo'i 'o Kānewai and the 'Aha Moku Advisory Council who were notified of the proposed Project.

Finally, if OHA's Ka Pouhana would find it helpful to have a briefing by UHM representatives on their Updated Proposed LRDP, please let us know and we will convey the request to UHM.

A notification of the Final EA's publication in the *Environmental Notice* will be provided to your office. Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the forthcoming Final EA. If you have any questions, please contact me at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam  
Director of Planning

AK:kc

cc: Mr. Ethen Thacher, Director, Development, Greystar  
Ms. Jan Gouveia, Vice President for Administration, University of Hawai'i  
Mr. Kamakana Ferreira, Lead Compliance Specialist, Office of Hawaiian Affairs





## HAWAII REGIONAL COUNCIL OF CARPENTERS

via email to  
akam@bchdesign.com

September 8, 2020

Vice President Jan Gouveia  
University of Hawaii at Manoa  
Bachman Hall, Room 109H  
2444 Dole Street  
Honolulu, Hawaii 96822

RE: Draft Environmental Assessment (DEA) for the Mixed-Use Affordable Housing Project at the University of Hawaii at Manoa Campus

Dear Ms. Gouveia,

The Hawaii Regional Council of Carpenters (HRCC) has been extremely concerned about the chronic deficiency of rental apartment housing across the state. Along with our partners in the banking, development, landowning, contracting, architecture, and engineering communities, we formed the "Hawaii Rental Housing Coalition," with the aim of identifying and carrying out concrete private-sector steps to make a meaningful impact on the economics of building and operating rental housing for families in the low income and workforce income range.

Therefore, we are pleased to see that the University of Hawaii at Manoa intends to build a new multi-family mixed-use rental housing project for graduate students and faculty on campus, which would include two adjoining towers with up to 400 individual housing units.

We understand that the project is planned to be designed, built, financed, operated and maintained through a public-private partnership. **We, therefore, would like to request confirmation of whether construction of the project will be subject to Hawaii's prevailing wage law, as is required by HRS 104-2(a)(2). We would also like to request confirmation of whether contractors participating in construction of the project will be subject to Hawaii's law regarding employment of state residents on construction procurement contracts, as described in HRS 103B.**

We also appreciate the DEA's estimation that the total project cost is anticipated to be \$85 million. **We would request that the Final Environmental Assessment include more details on the direct and indirect jobs and estimated construction wages that may be created by this project.** This will help our union and other industry stakeholders to better understand the potential positive economic impacts of the project.

Thank you very much for the opportunity to provide these comments.

Mahalo,

Kyle Chock  
Asst. Executive Secretary-Treasurer

### STATE HEADQUARTERS & BUSINESS OFFICES

**OAHU:** 1311 Houghtailing Street, Honolulu Hawaii 96817-2712 • Ph. (808) 847-5761 Fax (808) 440-9188  
**HILO OFFICE:** 525 Kilauea Avenue, Room 205, Hilo, Hawaii 96720-3050 • Ph. (808) 935-8575 Fax (808) 935-8576  
**KONA OFFICE:** 75-126 Lunapule Road, Kailua-Kona, Hawaii 96740-2106 • Ph. (808) 329-7355 Fax (808) 326-9376  
**MAUI OFFICE:** 330 Hookahi Street, Wailuku, Maui 96793-1449 • Ph. (808) 242-6891 Fax (808) 242-5961  
**KAUAI OFFICE:** Kuhio Medical Cir Bldg., 3-3295 Kuhio Hwy, Suite 201, Lihue, Kauai 96766-1040 • Ph. (808) 245-8511 Fax (808) 245-8911



March 15, 2021  
2020.70.0200 / 21P-010

Mr. Kyle Chock  
Asst. Executive Secretary—Treasurer  
Hawai'i Regional Council of Carpenters  
1311 Houghtailing Street  
Honolulu, Hawai'i 96817-2712

Dear Mr. Chock:

**Response to Comments  
Draft Environmental Assessment (DEA)  
Mixed-Use Affordable Housing Project at the  
University of Hawai'i at Manoa Campus  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

Thank you for your letter dated September 08, 2020, in response to the subject DEA—Anticipated Finding of No Significant Impact for the proposed Mixed-Use Affordable Housing Project at the University of Hawai'i at Mānoa Campus which is being renamed in the Final EA as the Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus. The name is being revised to better reflect the project and avoid confusion regarding the term “affordable”, as the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty. The rental units are not for the general public nor will they be income restricted.

The DEA was originally published in the Office of Environmental Quality Control's September 08, 2020, issue of the *Environmental Notice* and republished in the October 23, 2020, issue to extend the public comment period. Your review of the DEA and participation in the review process is most appreciated. Please see our response to your comments below.

**1. Prevailing wage law requirements and employment of State residents.**

The Proposed Action will be constructed in accordance with all applicable legal requirements, including Hawai'i's prevailing wage and labor laws



**2. Potential job creation and economic growth created by the Proposed Action.**

We acknowledge your request to include additional details in the Final EA regarding potential direct and indirect job creation and estimated construction wages that may be generated by the Proposed Action. As discussed in Chapter five of the DEA, the Proposed Action is consistent with State and County Plans regarding positive economic growth and employment generation.

The purpose of HRS Chapter 343 is to assess and analyze the scope of potential impacts a project may create as early as possible in the design process. As such, a finalized design is not complete for the Proposed Action. Any additional analysis of potential economic growth or job creation beyond that already described in the DEA would be dependent on the final design.

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the forthcoming Final EA. If you have any questions, please contact me at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



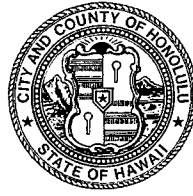
Allen Kam  
Director of Planning

AK:kc

cc: Mr. Ethen Thacher, Director, Development, Greystar  
Ms. Jan Gouveia, Vice President for Administration, University of Hawai'i

POLICE DEPARTMENT  
CITY AND COUNTY OF HONOLULU

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



KIRK CALDWELL  
MAYOR

SUSAN BALLARD  
CHIEF

JOHN D. McCARTHY  
CLYDE K. HO  
DEPUTY CHIEFS

OUR REFERENCE EO-DK

October 30, 2020

Mr. Allen Kam  
Director of Planning  
Belt Collins Hawaii LLC  
2153 North King Street, Suite 200  
Honolulu, Hawaii 96819

Dear Mr. Kam:

This is in response to your letter of October 20, 2020, requesting input on the republication of a Draft Environmental Assessment, for the proposed Multi-Family Student and Faculty Housing project on the University of Hawaii-Manoa Campus located at 2570 Dole Street.

The Honolulu Police Department (HPD) anticipates short-term impacts to vehicular traffic around the project area. The HPD recommends that all necessary signs, lights, barricades, and other safety equipment be installed and maintained by the contractor during the construction phase of the project.

Additionally, the HPD would like to address public safety due to the increase in pedestrian and vehicular traffic around the proposed development. The HPD recommends implementing clearly defined crosswalks and brighter, more suitable lighting for the students, faculty, and their families during the evening hours. Lastly, due to the project's 400 residential units and additional retail component, the HPD has concerns with the security of the area once the project is completed.

If there are any questions, please call Major Mike Lambert of District 7 (East Honolulu) at 723-3369.

Thank you for the opportunity to review this project.

Sincerely,

A handwritten signature in black ink, appearing to read "Wade K. Vanic", is written over the typed name.

WADE K. VANIC  
Assistant Chief of Police  
Support Services Bureau

cc: Ms. Jan Gouveia, Vice President  
for Administration  
University of Hawaii at Manoa





March 15, 2021  
2020.70.0200 / 21P-011

Mr. Rade K. Vanic  
Assistant Chief of Police  
Honolulu Police Department  
Support Services Bureau  
801 South Beretania Street  
Honolulu, Hawai'i 96813

Dear Mr. Vanic:

**Response to Comments  
Draft Environmental Assessment (DEA)  
Mixed-Use Affordable Housing Project at the  
University of Hawai'i at Manoa Campus  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

Thank you for your letter dated October 30, 2020, in response to the subject DEA—Anticipated Finding of No Significant Impact for the proposed Mixed-Use Affordable Housing Project at the University of Hawai'i at Mānoa Campus which is being renamed in the Final EA as the Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus. The name is being revised to better reflect the project and avoid confusion regarding the term “affordable”, as the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty. The rental units are not for the general public nor will they be income restricted.

The DEA was originally published in the Office of Environmental Quality Control's September 08, 2020, issue of the *Environmental Notice* and republished in the October 23, 2020, issue to extend the public comment period. Your review of the DEA and participation in the review process is most appreciated. Please see our response to your comments below.

**1. Potential short-term impacts to vehicular traffic around project.**

As discussed in Section 4.1.2.1 of the DEA, the Developer will coordinate with Honolulu Police Department (HPD) to minimize potential disturbances to traffic flow during construction. The Developer will also be responsible for using necessary safety devices such as signs, lights, barricades, etc. during construction to ensure public safety. Further, a Transportation Management Plan and a Construction Management Plan will be developed for the Proposed Action to ensure construction impacts remain minimal.

**2. Public safety regarding increase in pedestrian and vehicle traffic.**

The Proposed Action is not anticipated to greatly increase the number of pedestrians or vehicle traffic in the area because the intent of the project is to provide housing to students and faculty already using the campus' parking and pedestrian facilities.



Existing and future traffic conditions, along with mitigation measures, are discussed in Section 4.4.1 of the DEA. The University of Hawai'i at Mānoa (UHM) is coordinating with the Department of Transportation Services (DTS) on implementing Complete Streets for University Avenue. Additional design details relating to safety for pedestrians beyond those discussed in the DEA will be addressed during the design phase of the Proposed Action.

Further, the UHM is in the process of updating their Long Range Development Plan (LRDP). The updated LRDP is intended to support UHM's guiding principles, one of which is to foster inclusivity and greater connectivity. This will be achieved by prioritizing safe, multi-modal transportation opportunities and transforming circulation patterns across the campus. The Proposed Action was one of several projects identified in the update and aligns with the guiding principles and planning objectives.

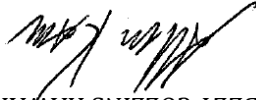
### 3. Security concerns upon completion of Proposed Action.

As discussed in Section 4.1.3 of the DEA, security services for the area will be provided by the University of Hawai'i at Mānoa Department of Public Safety (DPS) in support of police services provided by the HPD. It is anticipated the on-site security services provided by DPS will be sufficient in ensuring the continued public safety of the area upon completion of the Proposed Action (see Section 4.1.2.1 of the Final EA).

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the forthcoming Final EA. If you have any questions, please contact me at 521-5361 or by email at akam@bchdesign.com.

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam

Director of Planning

AK:kc

cc:

Mr. Ethen Thacher, Director, Development, Greystar  
Ms. Jan Gouveia, Vice President for Administration, University of Hawai'i

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](http://www.honolulu.gov/hfd)

KIRK CALDWELL  
MAYOR



MANUEL P. NEVES  
FIRE CHIEF

LIONEL CAMARA JR.  
DEPUTY FIRE CHIEF

October 29, 2020

Mr. Allen Kam  
Director of Planning  
Belt Collins Hawaii LLC  
2153 North King Street, Suite 200  
Honolulu, Hawaii 96819

Dear Mr. Kam:

Subject: Republication of Draft Environmental Assessment  
Mixed-Use Affordable Housing at the University of Hawaii at Manoa Campus  
2570 Dole Street  
Honolulu, Hawaii 96822  
Tax Map Key: 2-8-023: 009

In response to your letter dated October 20, 2020, regarding the abovementioned subject, the Honolulu Fire Department reviewed the submitted information, and has no additional comments at this time. Please refer to our previous letter dated June 8, 2020. A copy is enclosed for your convenience.

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

Sincerely,

A handwritten signature in blue ink, appearing to read "Jason Samala", is written over the word "Sincerely,".

JASON SAMALA  
Assistant Chief

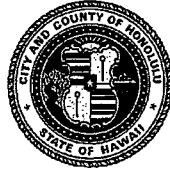
JS/WM:bh

Enclosure

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

June 8, 2020

Mr. Allen Kam  
Director of Planning  
Belt Collins Hawaii LLC  
2153 North King Street, Suite 200  
Honolulu, Hawaii 96819

Dear Mr. Kam:

Subject: Preconsultation for an Environmental Assessment  
Proposed University of Hawaii at Manoa Campus Student and Multi-Family  
Housing  
2570 Dole Street  
Honolulu, Hawaii 96822  
Tax Map Key: 2-8-023: 009

In response to your letter dated May 12, 2020, 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 (46 meters) 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 (15 meters) 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.)



Mr. Allen Kam  
Page 2  
June 8, 2020

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 (45,720 millimeters) 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, Sections 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](mailto:wmasuda@honolulu.gov).

Sincerely,



JASON SAMALA  
Assistant Chief

JS/TC:bh



March 15, 2021  
2020.70.0200 / 21P-012

Mr. Jason Samala  
Assistant Chief  
Honolulu Fire Department  
636 South Street  
Honolulu, Hawai'i 96813-5007

Dear Mr. Samala:

**Response to Comments  
Draft Environmental Assessment (DEA)  
Mixed-Use Affordable Housing Project at the  
University of Hawaii at Manoa Campus  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

Thank you for your letter dated October 29, 2020, in response to the subject DEA—Anticipated Finding of No Significant Impact for the proposed Mixed-Use Affordable Housing Project at the University of Hawai'i at Mānoa Campus; which is being renamed in the Final EA as the Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus. The name is being revised to better reflect the project and avoid confusion regarding the term “affordable”, as the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty. The rental units are not for the general public nor will they be income restricted.

The DEA was originally published in the Office of Environmental Quality Control's September 08, 2020, issue of the *Environmental Notice* and republished in the October 23, 2020, issue to extend the public comment period. Your review of the DEA and participation in the review process is most appreciated.

We acknowledge that the Honolulu Fire Department (HFD) has no additional comments at this time and has referred to its previous letter dated June 8, 2020, which was subsequently responded to in a letter dated July 23, 2020.

As discussed in that letter, fire access routes will be provided at the project site and the municipal water system will provide the project with potable water and flow requirements for fire protection. National Fire Protection Association requirements for Fire

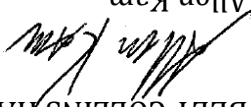


Department access and water supply will be reviewed and integrated into the project's design. Further, the fire apparatus access road will meet City & County requirements and have unobstructed width and vertical clearances. Upon completing the design, civil drawings will be submitted to the Honolulu Fire Department for review and approval.

Thank you for participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the forthcoming Final EA. If you have any questions, please contact me at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam

Director of Planning

AK:kc

cc: Mr. Ethen Thacher, Director, Development, Greystar  
Ms. Jan Gouveia, Vice President for Administration, University of Hawaii  
Mr. Wayne Masuda, Battalion Chief, Fire Prevention Bureau

## Umeyo Momotaro

---

**From:** Allen Kam  
**Sent:** Monday, November 23, 2020 4:21 PM  
**To:** Motoki, Michael S  
**Cc:** Youngling, Paula; Brady, Scott; Umeyo Momotaro; Sarah Harris; Ethen Thacher  
**Subject:** Re: Republication of DEA Mixed Use Affordable Housing at UH Manoa

**Categories:** Planning

Not a problem. Mahalo Mike.

Sent from my iPhone

On Nov 23, 2020, at 12:39 PM, Motoki, Michael S <michael.motoki@honolulu.gov> wrote:

Hi Allen,

The City Department of Transportation Services intends to submit comments on the subject project. However, we probably won't get our official signed comments to you before the end of day today. Is it possible to send them later this week?

Thank you,

Mike Motoki  
Department of Transportation Services  
Regional Planning Branch  
808-768-6684

---

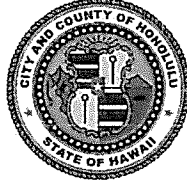
This email has been scanned for spam and viruses by Proofpoint Essentials. Click [here](#) to report this email as spam.



DEPARTMENT OF TRANSPORTATION SERVICES  
CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL  
MAYOR



JON Y. NOUCHI  
ACTING DIRECTOR

DREANALEE KALILI  
DEPUTY DIRECTOR

TP10/20-813618

December 2, 2020

Mr. Allen Kam, Director of Planning  
Belt Collins Hawaii LLC  
2153 North King Street, Suite 200  
Honolulu, Hawaii 96819

Dear Mr. Kam:

**SUBJECT:** Republication of the Draft Environmental Assessment and Anticipated Findings of No Significant Impact for the Mixed-Use Affordable Housing Project at the University of Hawai'i at Manoa Campus  
Tax Map Keys (TMK): (1) 2-8-023:009  
Honolulu, Oahu, Hawaii

Thank you for the opportunity to provide written comments regarding the subject project. We have the following comments.

- 1. Transportation Impact Assessment (TIA).** The applicant should perform a TIA to examine the vehicle, pedestrian, bicycle, and public transit stress and comfort levels at the nearby intersections and driveways with corresponding improvements to mitigate these impacts by applying Complete Streets principles. The applicant shall discuss the future year growth rate, trip distribution, mode split, and route assignment assumptions used in the TIA. The applicant shall submit all native files (e.g., Synchro, Excel, etc.) for the raw multi-modal counts and accompanying analyses to the Regional Planning Branch (RPB) at [dtsplanningdiv@honolulu.gov](mailto:dtsplanningdiv@honolulu.gov). Please refer to the Department of Transportation Services (DTS) TIA Guide for multimodal assessment tools and recommended analyses. The TIA Guide can be found at <http://www4.honolulu.gov/docushare/dsweb/View/Collection-7723>.

2. **Bicycle Parking.** The project should quantify the number of secure on-site bicycle parking being provided. Refer to Section No. 21-6.150 Bicycle Parking in the City and County of Honolulu Land Use Ordinance for minimum requirements.
3. **Street Usage Permit.** A street usage permit from the DTS should be obtained for any construction-related work that may require the temporary closure of any traffic lane or pedestrian mall on a City street.
4. **Neighborhood Impacts.** The area representatives, neighborhood board, as well as the area residents, businesses, emergency personnel (fire, ambulance, and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details and status throughout the project and the impacts that the project may have on the adjoining local street area network.
5. **Bus Stops.** The project site is in the immediate vicinity of bus stops. Submit project plans to DTS – Transportation Mobility Division (TMD) for review and approval. Contact DTS-TMD at [TheBusStop@honolulu.gov](mailto:TheBusStop@honolulu.gov)
6. **Disability and Communication Access Board (DCAB).** Project plans (vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by DCAB to ensure full compliance with Americans with Disabilities Act (ADA) requirements.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Scott Brady, of my staff, at 768-6693.

Very truly yours,



Jon Y. Nouchi  
Acting Director



March 15, 2021  
2020.70.0200 / 21P-013

Mr. Jon Nouchi  
Deputy Director  
City and County of Honolulu  
Department of Transportation Services  
650 South King Street, 3<sup>rd</sup> Floor  
Honolulu, HI 96813

Dear Mr. Nouchi:

**Response to Comments  
Draft Environmental Assessment (DEA)  
Mixed-Use Affordable Housing Project at the  
University of Hawai'i at Manoa Campus  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

Thank you for your email dated November 23, 2020, indicating your Department's intent to comment, and the follow-up comment letter dated December 2, 2020, in response to the subject DEA—Anticipated Finding of No Significant Impact for the proposed Mixed-Use Affordable Housing Project at the University of Hawai'i at Mānoa Campus; which is being renamed in the Final EA as the Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus. The name is being revised to better reflect the project and avoid confusion regarding the term “affordable”, as the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty. The rental units are not for the general public nor will they be income restricted.

The DEA was originally published in the Office of Environmental Quality Control's September 08, 2020, issue of the *Environmental Notice* and republished in the October 23, 2020, issue to extend the public comment period. Your review of the DEA and participation in the review process is most appreciated. Please see our response to your comments below.

**1. Transportation Impact Assessment**

A Traffic Impact Report (TIR) was prepared for the project to document potential traffic impacts generated by the Proposed Action and to provide mitigation measures to



reduce any potential effects. The TIR found that traffic conditions in the vicinity of the Proposed Action would remain generally unchanged by its implementation. A summary of the report's findings is provided in Section 4.4 of the DEA and the TIR is provided as Appendix E.

The Proposed Action is designed to encourage safe, multi-modal transportation using existing pedestrian, bicycle, and public transit systems in place throughout the University of Hawai'i at Mānoa (UHM) campus. The design of the Proposed Action is consistent with UHM's 2007 Long Range Development Plan (LRDP) objective to establish and encourage multimodal transportation by enhancing the existing pedestrian connectivity and providing additional bicycle parking facilities as discussed in Sections 4.4.6 and 4.4.5 of the DEA. As illustrated in Figure 4-6 of the DEA, the project site is within a ¼-mile radius of four City and County of Honolulu public bus system stops and five UHM Rainbow Shuttle transit service stops.

UHM supports additional Complete Streets designs in the vicinity of the Proposed Action, with regard to the campus' overall transportation flow as part of the LRDP's multimodal objective. For example, unrelated to this Proposed Action, UHM previously proposed a "scramble" crossing at the intersection of Dole Street and East-West Road to DTS. UHM remains open to that proposal. This information will be added to Section 4.4.6.1 of the Final EA.

At the current stage of project delivery, the design of the Proposed Action is still conceptual. As the design for this Project and the campus LRDP Update progress, UHM wishes to continue the dialogue with DTS to further discuss its concerns regarding a TIA.

## **2. Bicycle Parking**

The Project will provide a total of 41 short-term and 164 long-term bicycle parking stalls. The stalls will be dispersed around the buildings in proximity to the different entrances and on the Mauka side of the buildings. The updated number of bicycle parking stalls provided by the Proposed Action is included in Section 4.4.5.1 of the Final EA.

## **3. Street Usage Permit**

Prior to construction, the Developer will obtain a street usage permit for any construction-related work that requires the temporary closure of any traffic lane or pedestrian mall on City streets.

## **4. Neighborhood Impacts**

As part of the pre-consultation process, members of the public and government were consulted regarding the Proposed Action. A list of parties contacted during pre-consultation is provided in the DEA Summary and as Appendix F. Parties consulted



included nearby neighborhood boards, emergency personnel, DTS, and area residents. Further, on October 7, 2020, the University of Hawai'i presented the project to the Mānoa Neighborhood Board during the Board's monthly meeting to familiarize residents with the Proposed Action. The project Team will continue to coordinate with DPP TRB, DTS, and contact O'ahu Transit Services to ensure pedestrian safety as the project's design progresses.

These same parties and other interested parties were notified of the republication of the DEA. A list of those notified and all comments received during both public comment periods will be provided in the forthcoming Final EA pursuant to HRS Chapter 343. Communication of the Project's progress will continue with these and other interested parties, as appropriate.

#### **5. Bus Stops and Disability and Communication Access Board (DCAB)**

At this time, there are no specific proposals in place pertaining to the nearby bus stop (see Section 4.4.4.1 of the Final EA). As the Project's designs progress, plans will be provided to the Transportation Mobility Division and DCAB for review as appropriate.

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the forthcoming Final EA. If you have any questions, please contact me at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,  
BELT COLLINS HAWAII LLC



Allen Kam  
Director of Planning

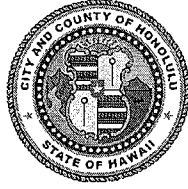
AK:kc

cc: Mr. Ethen Thacher, Director, Development, Greystar  
Ms. Jan Gouveia, Vice President for Administration, University of Hawai'i  
Mr. Roger J. Morton, Director Designate, Department of Transportation Services  
Mr. Scott Brady, Department of Transportation Services

DEPARTMENT OF PLANNING AND PERMITTING  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET, 7<sup>TH</sup> FLOOR • HONOLULU, HAWAII 96813  
PHONE: (808) 768-8000 • FAX: (808) 768-6041  
DEPT. WEB SITE: [www.honolulu.dpp.org](http://www.honolulu.dpp.org) • CITY WEB SITE: [www.honolulu.gov](http://www.honolulu.gov)

KIRK CALDWELL  
MAYOR



KATHY K. SOKUGAWA  
ACTING DIRECTOR

TIMOTHY F. T. HIU  
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI  
DEPUTY DIRECTOR

October 8, 2020

2020/ELOG-1821(GT)

Mr. Allen Kam  
Belt Collins Hawaii  
2153 North King Street  
Honolulu, Hawaii 96819

Dear Mr. Kam:

SUBJECT: Draft Environmental Assessment (EA)  
Chapter 343, Hawaii Revised Statutes  
Mixed-Use Affordable Housing Project at the University of Hawaii  
at Manoa  
2570 Dole Street - Manoa  
Tax Map Key 2-8-023: 009

This is in response to your letter (received September 16, 2020), requesting comments on the Draft EA for the proposed Mixed-Use Affordable Housing Project (Project) at the University of Hawaii at Manoa (former NOAA site). The Department of Planning and Permitting (DPP) has reviewed the information provided and offer the following comments:

1. Civil Engineering Branch:
  - a. The majority of the Project site is located within Flood Zone X, with a portion of the site abutting Manoa Stream located within Flood Zone AEF (not AE).
  - b. The Project's compliance with the City's "Rules Relating to Water Quality" and "Storm Drainage Standards" would be verified at the time that the grading/construction plans are submitted to DPP for review.

2. Wastewater Branch:

We have no objections to the proposed 400-unit mixed-use affordable housing Project. A Site Development Division Master Application Form for Sewer Connection should be submitted for the Project.

3. Subdivision Branch:

- a. A portion of the Project site is within the AE Flood Zone, and the Project shall comply with the standards set forth in Revised Ordinances of Honolulu (ROH) Chapter 21A (Flood Hazard Areas).
- b. Based on the information provided, it is unclear how the Project will comply with Park Dedication requirements. A more comprehensive review of the proposed park dedication areas will be provided upon submittal of the Park Dedication Application. Recommend the Applicant review ROH Section 22-7 and Rule 10 of the Park Dedication Rules & Regulations.

4. Traffic Review Branch:

- a. A timeline or phasing plan of the anticipated dates to obtain major building permit(s) for demolition/construction work, including the projected date of occupancy or opening, shall be prepared by the Applicant in a format acceptable to the Department. The timeline should identify when the construction management plan (CMP), the traffic management plan (TMP), updates and/or validation to the findings of the traffic impact report (TIR) dated July 2020 will be submitted for review and approval. Typically, the CMP should be submitted for review and approval prior to the issuance of demolition/building permits for major construction work. The TMP should be submitted and approved prior to the issuance of the (temporary) certificate of occupancy (CO). The TIR, including supplemental studies or subsequent updates, should be submitted and approved prior to the commencement of each major phase of work, as stipulated in the timeline or phasing plan, prepared by the Applicant. A new TIR may be required if there is a significant change to the scope or timing of the major work items contained in the initial report.
- b. The CMP shall identify the type, frequency and routing of heavy trucks and construction related vehicles. Every effort shall be made to minimize impacts from these vehicles and related construction activities. The CMP should identify and limit vehicular activity related to construction to periods outside of the peak periods of traffic, utilizing alternate routes for heavy

trucks, provisions for either on-site or off-site staging areas for construction related workers and vehicles to limit the use of on-street parking around the Project site and other mitigation measures related to traffic and potential neighborhood impacts. Preliminary or conceptual traffic control plans should also be included in the CMP. The Applicant shall document the condition of roadways prior to the start of construction activities and provide remedial measures, as necessary, such as restriping, road resurfacing and/or reconstruction if the condition of the roadways has deteriorated as a result of the related construction activities.

- c. A TMP shall include traffic demand management (TDM) strategies to minimize the amount of vehicular trips for daily activities. TDM strategies could include carpooling and ride sharing programs, transit, bicycle and pedestrian incentives and other similar TDM measures. A bike/pedestrian circulation plan should also be included to provide accessibility and connectivity to and along the surrounding public sidewalks, street intersections, and adjacent properties. Moped parking and bike parking should be situated in easily accessible locations and in adequate number throughout the Project to support the number of units with no vehicular parking. A post TMP will be required approximately one year after the issuance of the CO to validate the relative effectiveness of the various TDM strategies identified in the initial report. Additional bicycle racks shall be installed if it is determined there is a latent demand and the existing number of racks are inadequate.
- d. A detailed layout and analysis of the drop-off/pick-up area for the day care and ride sharing activities should be provided during the design phase. The approved layout shall be included in the TMP with a description of the operations. Please identify the proposed vehicular circulation patterns in relation to the two driveways on East-West Road and Dole Street and how this will be managed.
- e. A parking assessment/management plan shall be provided in the TIR and TMP. This assessment should identify the availability and need for off-site parking areas to support this Project, unless renters will be restricted from owning a vehicle. Once off-site parking areas are identified, updates to the TIR may be needed to include trips attributed to the project.
- f. The TIR should include the University Avenue/Dole Street intersection in its analysis.



- g. The TIR should include trip rates attributable to the 400 units via ride sharing or residents being dropped-off/picked up.
- h. A post TIR will be required approximately one year after the issuance of the CO to validate the traffic projections, distribution and assignment contained in the latest accepted TIR. The use and operation of the drop-off/pick-up area should be assessed to assure vehicles are not queuing onto public sidewalks and streets. If additional traffic mitigation measures or modifications are necessary to support related traffic impacts directly attributable to this development, the Applicant will be required to implement these measures. If the findings of the post TIR are inconclusive, a follow up study may be required within a year of this prior study, as necessary.
- i. Construction plans for all work within or affecting public streets should be submitted for review and approval. Traffic control plans during construction should also be submitted for review and approval, as required.
- j. The vehicular access on Dole Street shall be constructed as a standard City dropped driveway and shall be a minimum of 20 feet wide. Adequate vehicular sight distance shall be provided and maintained at all driveways to pedestrians and other vehicles. Driveway grades shall not exceed five percent for a minimum distance of 25 feet from the property line.
- k. All loading and trash pick-up areas shall be designed such that vehicles enter and exit front first. Provide adequate on-site turn-around areas and ensure that the layout of parking spaces in the loading/delivery area does not interfere with turning maneuvers for large vehicles.

5. Building Division:

- a. Address any existing or future non-compliance with Land Use Ordinance (LUO) development standards.
- b. All proposed modifications to the LUO development standards should be clearly disclosed.
- c. The Project will be reviewed during the building permit(s) process for compliance with Plan Review Use Modification approval Conditions and normal LUO development standards not modified by the PRU MOD approval.

6. Planning Division:

- a. The Final EA (FEA) should discuss the updated proposal for the General Plan, which is currently with City Council.
- b. The FEA should also discuss the Primary Urban Center Development Plan that is being updated and materials regarding existing conditions of topics such as infrastructure and transportation, which can be found on the Project website [www.pucdp.com](http://www.pucdp.com).
- c. To address the effects of global climate change, the FEA should include an analysis of Low Impact Development and conservation best management practices that may help mitigate elevated temperatures and evapotranspiration on the project site. A suitable analysis may consider for example, green or cool roof(s), opportunities for permeable paving or reduced hardscape, on-site storm water retention and/or filtration, shade trees, and water conservation measures.
- d. The FEA should note that there is a warning on the property that building permits for structures over 50 years old need to be sent to the Department of Land and Natural Resources Historic Preservation Division.

7. Land Use Permit Division:

- a. The FEA should explain in greater detail how the proposed Project will comply with the requirements of the LUO and discuss any development standards that may need to be modified.
- b. Section 1.6 should include the time required to obtain land use and "Development Schedule" construction plan approvals.
- c. The proposal requires a Minor Modification to the PRU Permit No. 2009/PRU-3 for the UH Manoa campus, approved by the City Council on March 17, 2010, as Resolution No. 09-341, CD1, FD1.
- d. The FEA should include specific proposals pertaining to the nearby bus stop, future location of a rail station and mechanisms to ensure pedestrian safety. We recommend that the Applicant keep the City Department of Transportation Services and the Honolulu Authority on Rapid Transit informed and involved with the Project.
- e. The FEA should show and discuss in greater detail the proposed tree disposition, landscaping, and open space requirements and plans.

- f. The FEA must include the following conceptual plans:
  - i. A site plan showing all required yards, road widening, parking, loading, child care drop-off and pick-up, emergency vehicle access and maneuvering, trash location, pedestrian circulation around the site and access to the main campus, setback and building setbacks.
  - ii. Building elevations showing the building envelope including yards, height setbacks and height limits.

All plans must include a graphic scale.

- g. Discuss how the proposed height, massing and architectural design of the proposed buildings compare to those nearby and impact neighborhood character, including architectural articulation of facades facing Dole Street.
- h. Provide street views approaching from east and west on Dole Street, including the existing buildings and proposed building on each side of the street.
- i. Provide wind studies showing the effect of the proposed and existing buildings and the "gateway effect" through Dole Street.
- j. Discuss in more detail:
  - i. The retail operations, including type and business hours.
  - ii. The number of parking spaces devoted to the units, retail and childcare operations.
  - iii. Child care drop-off and pick-up, including alternate exiting for vehicular traffic during peak drop-off and pick-up periods.
  - iv. Vehicular circulation, including possible exiting to East-West Road.
  - v. The pedestrian path along the stream and where it connects to, including to the main campus. The path should follow natural contours to minimize grading.
  - vi. Location of cross walks, pedestrian traffic, lodging units, multi-modal transportation facilities, campus facilities, commercial and retail spaces.

Mr. Allen Kam  
October 8, 2020  
Page 7

Should you have any questions, please contact Gerald Toyomura, of our Urban Design Branch, at 768-8056.

Very truly yours,

  
for Kathy K. Sokugawa  
Acting Director

cc: Jan Gouveia, University of Hawaii  
Ethan Thacher, Greystar Development Services, LLC



March 15, 2021  
2020.70.0200 / 21P-014

Mr. Dean Uchida  
Director  
City and County of Honolulu  
Department of Planning and Permitting  
650 South King Street, 7<sup>th</sup> Floor  
Honolulu, Hawai'i 96813

Dear Mr. Uchida:

**Response to Comments  
Draft Environmental Assessment (DEA)  
Mixed-Use Affordable Housing Project at the  
University of Hawaii at Manoa Campus  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

Thank you for then-Acting Director Sokugawa's letter dated October 08, 2020, in response to the subject DEA—Anticipated Finding of No Significant Impact for the proposed Mixed-Use Affordable Housing Project at the University of Hawai'i at Mānoa Campus which is being renamed in the Final EA as the Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus. The name is being revised to better reflect the project and avoid confusion regarding the term "affordable", as the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty. The rental units are not for the general public nor will they be income restricted.

The DEA was originally published in the Office of Environmental Quality Control's September 08, 2020, issue of the *Environmental Notice* and republished in the October 23, 2020, issue to extend the public comment period. Your review of the DEA and participation in the review process is most appreciated. Please see our response to your comments below.

Civil Engineering Branch

As discussed in Section 2.5.2 of the DEA, the majority of the project site is located within Flood Zone X and a portion of the site abutting Mānoa Stream is located within Flood Zone AEF. It is acknowledged that this portion of the site abutting Mānoa Stream is





located within Flood Zone AEF, not AE as shown in Figure 2—8. The Figure has been revised for the forthcoming Final EA and can be found in Section 2.5.2. We acknowledge that no development will occur within the Flood Zone AEF.

Thank you for acknowledging that compliance with the “Rules Relating to Water Quality” and “Storm Drainage Standards” will be verified at the time the Proposed Action’s grading/construction plans are submitted to the City and County of Honolulu, Department of Planning and Permitting (DPP) for review. This can be found in Section 4.3.3.1 of the Final EA.

#### Wastewater Branch

Thank you for acknowledging that the Wastewater Branch has no objections to the Proposed Action. A Site Development Division Master Application Form for Sewer Connection will be submitted for the Proposed Action prior to construction. Your comment can be found in Section 4.3.2.1 of the Final EA.

#### Subdivision Branch

As discussed in Section 2.5.2 of the DEA, the overall risk of the Proposed Action to flooding is considered low and no development will occur in the AEF Flood Zone. Even with this low risk, the University of Hawai‘i at Mānoa (UHM) intends to comply with the standards set forth in Revised Ordinances of Honolulu (ROH) Chapter 21A (Flood Hazard Areas) and intends to incorporate safety measures and built-in flood protection safeguards in the Proposed Action’s design. Safety measures and safeguards are discussed in Section 2.5.2.1 of the DEA.

It is acknowledged that the Subdivision Branch has concerns regarding the Proposed Action’s compliance with Park Dedication requirements set forth in ROH Section 22-7 and Rule 10 of Park Dedication Rules & Regulations. The Proposed Action is subject to Plan Review Use (PRU) Permit No. 2009/PRU-3 (Resolution No. 09-341, CD1, FD1) issued for the UH 2007 Long Rang Development Plan (LRDP), which sets forth the landscape and open space requirements. Further, the Proposed Action is intended to provide housing for graduate students and junior faculty of the University. During the November 6, 2020, meeting with DPP and UHM, DPP concurred that student housing does not trigger park dedication requirements. Therefore, park dedication requirements are not applicable to the Proposed Action.

Although the Proposed Action is not subject to park dedication requirements, the 2007 LRDP envisioned and defined the creation of meaningful outdoor places for living and learning on the Mānoa campus. The intent being the campus would become a pedestrian-dominated space, offering areas for active or passive recreational pursuits. The Proposed Action meets the landscape requirements described in the 2007 LRDP. As discussed throughout the DEA, the Proposed Action’s design elements include shaded common areas for gathering, which contributes to the creation of green corridors between Upper and Lower Campus. While the final design elements are still being developed, they are intended to provide a “live, work, play” environment for students and residents in support of UHM’s long-term sustainability and connectivity goals.

#### Traffic Review Branch

As requested by DPP's Traffic Review Branch (TRB), a timeline or phasing plan of the anticipated dates to obtain major building permit(s) for demolition/construction work, including the projected date of occupancy and opening, will be prepared and submitted to the Department. For this effort, the Project Team will coordinate with DPP TRB on the timeline and information required for submittals for the Construction Management Plan (CMP), Traffic Management Plan (TMP) which includes Traffic Demand Management (TDM) strategies, and updates to the Traffic Impact Report (TIR).

As discussed in Section 4.4. of the DEA and provided as Appendix E, a Traffic Impact Report (TIR) was prepared for the Proposed Action. The TIR analyzed potential traffic impacts resulting from increased trip generation and overall increase in use at the three nearest intersections to the Proposed Action. One of the intersections analyzed, Lower Campus Road and Dole Street, is less than 400 feet east of the University and Dole Street intersection as noted in your letter. The TIR found that traffic conditions were anticipated to remain generally consistent to the No Action alternative. We recognize that the Proposed Action will be subject to the mitigation measures and recommendations outlined in the current TIR, and the Project Team will coordinate with DPP on the timing and submittal of additional information requested in your letter, including a post-TIR that will need to be conducted one year after receipt of the certificate of occupancy.

Furthermore, the Project Team will coordinate with DPP TRB on the timing and content of information to be provided regarding the layout and analysis of the drop-off/pick-up area for the childcare and ride sharing activities, vehicular circulation patterns in relation to the driveway on Dole Street and possible driveway access on East-West Road, construction plans, and traffic control requirements. The Project Team acknowledges and will work to incorporate your comments related to vehicular access, driveway layout, and loading and trash pick-up into the design of the Proposed Action.

#### Building Division

As discussed in our response to the DPP TRB, the design of the Proposed Action is still conceptual. The forthcoming PRU Minor Modification Application will provide a detailed description of the relation between the LUO and the Proposed Action, including any existing and future non-compliance, and proposed modifications to the LUO development standards. We also understand that the Proposed Action will be reviewed during the building permit(s) process for compliance with Plan Review Use Modification approval conditions and normal LUO development standards not modified by the PRU modification approval (see Section 5.2.4 of the Final EA).

### Planning Division

A discussion of how the Proposed Action is consistent with the currently adopted O‘ahu General Plan and Primary Urban Center Development Plan is included in Section 5.2 of the DEA within Table 5-5 and Table 5-6, respectively. As requested, further discussion regarding compliance with the proposed General Plan Update, which is currently under review by the City Council, and the Primary Urban Center Development Plan Update, which is currently being drafted, have been added in Sections 5.2.1 and 5.2.2, respectively, of the forthcoming Final EA.

As discussed throughout the DEA, the Proposed Action will use Leadership in Energy and Environmental Design (LEED) Silver Certified standards as design guidelines. As the design of the Proposed Action is still conceptual, the forthcoming PRU Minor Modification Application will include design descriptions and locations relating to Low Impact Development and conservation best management practices that may help mitigate the potentials for elevated temperatures and evapotranspiration on the Project site (see Section 2.5.1.1 of the Final EA).

In determining whether historic properties will be adversely impacted, it is recognized that the HRS Chapter 6E review process is essential in identifying sites and generating mitigation commitments in consultation with the Department of Land and Natural Resources, State Historic Preservation Division (SHPD). The University of Hawai‘i, as the proposing agency, notified the SHPD as part of the consultation process and intends to share the findings of both the Reconnaissance Level Surveys (Section 3.1) and Archaeological Literature Review and Field Inspection (ALRFI) report (Section 3.3) of the DEA, and provided as Appendixes D and C, in compliance with HRS Chapter 6E.

### Land Use Permit Division

As previously discussed in this letter, the design of the Proposed Action is still conceptual and detailed design elements are still being refined. The disclosure and evaluation of anticipated environmental impacts within the EA is based on a conservative, programmatic project description intended to allow for some range of flexibility in design. This allows for appropriate adaptation and response to issues raised as development efforts progress. As such, specific details on information related to compliance with the requirements of the LUO and modifications to development standards will be addressed in the PRU Minor Modification submittal (see Section 5.2.4 of the Final EA).

Regarding the timing required to obtain land use and construction plan approvals, Section 1.6 of the DEA includes a discussion on the development schedule which anticipates construction of the project to begin by Spring 2023. In coordination with DPP, following completion of compliance with the HRS Chapter 343 process, UHM anticipates the submittal of the PRU Minor Modification to DPP for review and approval. Also on-going will be coordination on compliance with HRS Chapter 6E requirements. Following approval of the Minor Modification, a building permit and other construction related permits will be pursued as required prior to commencing construction of the project.

We acknowledge that a Minor Modification to PRU Permit No. 2009/PRU-3 (Resolution No. 09-341, CD1, FD1) for the UHM campus will be required to permit construction of the

project. As noted in your letter, the forthcoming PRU Minor Modification Application will provide scaled conceptual drawings including a site plan, building elevations and envelopes, and design details of parking, crosswalks (as applicable) and multi-modal facilities, child-care drop-off and pick-up areas, vehicular and pedestrian circulation, emergency vehicle access and maneuvering, trash locations, and setbacks. The application submittal will also discuss the relationship of the future proposed design of the project to Land Use Ordinance Development Standards as pertaining to the criteria outlined in your letter (see Section 5.2.4 of the Final EA).

Currently, there are no specific proposals in place pertaining to the nearby bus stop. To ensure pedestrian safety in the vicinity of the Proposed Action, we will coordinate with DPP TRB and DTS as the project's design progresses (see Section 4.4.6.1 of the Final EA). Regarding the future location of a rail station, the UHM has coordinated with HART, DTS, and other City agencies on matters related to planning for the Honolulu Rail Transit project and Complete Streets. The University is supportive of rail and multi-modal access to the campus and will continue to work with DTS and HART on planning efforts to enhance multi-modal access for a possible future extension of the rail alignment to and/or in the vicinity of the UHM campus (see Section 4.4.4.1 of the Final EA).

While a proposed landscape, tree disposition, and open space plan is yet to be developed for the Proposed Action, these plans will be prepared in consultation with the UHM's LRDP landscape guidelines and will strive to reflect the traditions, history and spiritual significance of Mānoa Valley and the Hawaiian culture. The landscape and open space plans will describe the landscape design elements that include shaded common areas which strive to visually connect the pedestrians and residents to the Mānoa Stream and green corridors between the Upper and Lower Campus. These plans will incorporate considerations for low impact development and best management practices and will maximize the use of native or non-invasive plant species (see Section 2.7.1.1 of the Final EA).

Street views of existing buildings and the Proposed Action, including the approach from east and west along Dole Street, are provided as Figures 2-10 to 2-14 in the DEA. The Figures showcase how the Proposed Action's height, massing, and architectural design compare and relate to buildings in the surrounding area. Information on how the architectural design of the proposed building's facades facing Dole Street will be provided to DPP when the design for the Proposed Action is further developed.

As requested, a wind analysis will be prepared for the Proposed Action relating to any potential "gateway effect" along Dole Street. The findings from the study will be provided to the DPP in coordination with the PRU Minor Modification when the design for the Proposed Action is further developed.

Further details requested by DPP's Land Use Permit Division regarding the nature of the retail operations and commercial retail spaces, child-care drop-off and pick-up areas, vehicular circulation-including possible exiting to East-West Road, the pedestrian path and the location of cross walks, pedestrian traffic, lodging units, multi-modal transportation facilities, campus facilities, and commercial and retail space are still being refined with the design of the project, but information available is provided below.

Information on the nature of retail operations and commercial retail spaces are difficult to provide at this time as the commercial operators, anticipated operations and use of the spaces may not be identified until the project is closer to, or under construction. Nevertheless, the Developer intends to fill this space with a tenant or tenants that cater(s) to residents and campus users.

For parking, the Proposed Action would prioritize on-site parking for short-term rideshare, carshare and childcare loading zones to promote multi-modal transportation objectives of the LRDP. No long-term parking will be provided on-site for residents or staff members; however, alternate permit and visitor parking facilities are available on campus as needed. Current parking structures on campus and the addition of a future parking facility would help to mitigate potential impacts of the additional parking demands created by residents of the Proposed Action, as discussed in Section 4.4.3.1 of the DEA.

While details on the location and size of the lodging units and other facilities are still being refined, these facilities will be located within the building and tower footprints identified in Figure 1-6 of the DEA. The details regarding the child-care drop-off and operations and vehicular circulation (including possible exiting to East-West Road) are being refined, and the project may require the use of a portion of University property in TMK 2-8-023: 003 as discussed in the TIR (see Appendix E).

The design of the pedestrian path, which is currently proposed to be located near the eastern side of the property, will be sited with considerations for the natural contours and topographic features to avoid impacts to Mānoa Stream from grading (see Section 2.3.2 of the Final EA).

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the forthcoming Final EA. If you have any questions, please contact me at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,  
BELT COLLINS HAWAII LLC



Allen Kam  
Director of Planning

AK:kc

cc: Mr. Ethen Thacher, Director, Development, Greystar  
Ms. Jan Gouveia, Vice President for Administration, University of Hawai'i  
Mr. Gerald Toyomura, Urban Design Branch, City and County of Honolulu, Department of Planning and Permitting



## Sarah Harris

---

**From:** Allen Kam  
**Sent:** Thursday, October 8, 2020 8:16 AM  
**To:** Sarah Harris; Umeyo Momotaro; Ethen Thacher  
**Subject:** Fwd: DOH Clean Air Branch Comments on Draft EA for Mixed-Use Affordable Housing at the University of Hawai'i at Mānoa Campus

Sent from my iPhone

Begin forwarded message:

**From:** Cab General <Cab.General@doh.hawaii.gov>  
**Date:** October 8, 2020 at 8:11:04 AM HST  
**To:** "jgouveia@hawaii.edu" <jgouveia@hawaii.edu>, Allen Kam <akam@bchdesign.com>  
**Subject:** DOH Clean Air Branch Comments on Draft EA for Mixed-Use Affordable Housing at the University of Hawai'i at Mānoa Campus

Aloha

Thank you for the opportunity to provide comments on the subject project.

Please see our standard comments at:

<https://health.hawaii.gov/cab/files/2019/04/Standard-Comments-Clean-Air-Branch-2019.pdf>

Please let me know if you have any questions.

Barry Ching  
Clean Air Branch  
Hawaii Department of Health  
(808) 586-4200

---

This email has been scanned for spam and viruses by Proofpoint Essentials. Click [here](#) to report this email as spam.

**Standard Comments for Land Use Reviews  
Clean Air Branch  
Hawaii State Department of Health**

If your proposed project:

Requires an Air Pollution Control Permit

You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch.

s

Includes construction or demolition activities that involve asbestos

You must contact the Asbestos Abatement Office in the Indoor and Radiological Health Branch.

Has the potential to generate fugitive dust

You must control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near to existing residences, business, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does *not* require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems.

Construction activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential nuisance complaints.

You should provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:

- a) Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
- b) Providing an adequate water source at the site prior to start-up of construction activities;
- c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
- d) Minimizing airborne, visible fugitive dust from shoulders and access roads;
- e) Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
- f) Controlling airborne, visible fugitive dust from debris being hauled away from the project site.

If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch

Clean Air Branch (808) 586-4200 <a href="mailto:cab@doh.hawaii.gov">cab@doh.hawaii.gov</a>	Indoor Radiological Health Branch (808) 586-4700
--	---

April 1, 2019



March 15, 2021  
2020.70.0200 / 21P-015

Mr. Barry Ching  
Clean Air Branch  
Hawai'i State Department of Health  
2827 Waimano Home Road #130  
Pearl City, Hawai'i 96782

Dear Mr. Ching:

**Response to Comments  
Draft Environmental Assessment (DEA)  
Mixed-Use Affordable Housing Project at the  
University of Hawai'i at Manoa Campus  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

Thank you for your email dated October 08, 2020, in response to the subject DEA—Anticipated Finding of No Significant Impact for the proposed Mixed-Use Affordable Housing Project at the University of Hawai'i at Mānoa Campus which is being renamed in the Final EA as the Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus. The name is being revised to better reflect the project and avoid confusion regarding the term “affordable”, as the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty. The rental units are not for the general public nor will they be income restricted.

The DEA was originally published in the Office of Environmental Quality Control's September 08, 2020, issue of the *Environmental Notice* and republished in the October 23, 2020, issue to extend the public comment period. Your review of the DEA is most appreciated. Please see our response to your comments below.

The proposed project will adhere to all applicable standard comments outlined and provided in your letter regarding air pollution, asbestos, and fugitive dust. This will be included in Section 2.8.1.1 of the Final EA



Mr. Ching  
March 15, 2021 / 21P-015  
Page 1

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in Appendix G of the Final EA. If you have any questions, please contact me at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC

A handwritten signature in black ink, appearing to read "Allen Kam". The signature is fluid and cursive, written over a faint horizontal line.

Allen Kam  
Director of Planning

AK:kc

cc: Mr. Ethen Thacher, Director, Development, Greystar  
Ms. Jan Gouveia, Vice President for Administration, University of Hawai'i



STATE OF HAWAII  
DEPARTMENT OF EDUCATION

P.O. BOX 2360  
HONOLULU, HAWAII 96804

OFFICE OF FACILITIES AND OPERATIONS

October 1, 2020

Allen Kam  
Belt Collins Hawaii  
2153 North King Street  
Honolulu, Hawaii 96819

Re: Draft Environmental Assessment for the Mixed-Use Affordable  
Housing Project at the University of Hawaii Manoa Campus  
Honolulu, Oahu, Hawaii TMK 2-8-023:009

Dear Mr. Kam:

The Hawaii State Department of Education (HIDOE) has the following comments for the proposed mixed-use affordable housing project (Project); a public private partnership between the University of Hawaii Manoa and Greystar Development Services, LLC. The proposed Project will have approximately 400 multi-family rental units with a mix of studios, one-, two- and three bedrooms; a child care facility along with retail space located at the University of Hawaii Manoa, TMK 2-8-023:009, Honolulu, Island of Oahu.

The HIDOE schools servicing the project are Noelani Elementary, Stevenson Middle, and Roosevelt High. Both Noelani and Stevenson are operating at capacity. They will continue to operate at capacity over the next five years. Roosevelt High is operating over capacity and will remain over capacity over the next five years.

Thank you for the opportunity to comment. Should you have questions please contact Robyn Loudermilk, Acting Land Use Planner of the Facilities Development Branch, Planning Section, at 784-5093 or via email at [robyn.loudermilk@k12.hi.us](mailto:robyn.loudermilk@k12.hi.us).

Respectfully,

Kenneth G. Masden II  
Public Works Manager  
Planning Section

KGM:rl

c: Linell Dilwith, Complex Area Superintendent, Kaimuki/McKinley/Roosevelt





March 15, 2021  
2020.70.0200 / 21P-016

Mr. Kenneth G. Masden II  
Public Works Manager  
Planning Section  
Office of Facilities and Operations  
State of Hawai'i  
Department of Education  
P.O. Box 2360  
Honolulu, Hawai'i 96804

Dear Mr. Masden:

**Response to Comments  
Draft Environmental Assessment (DEA)  
Mixed-Use Affordable Housing Project at the  
University of Hawai'i at Mānoa Campus  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

Thank you for your letter dated October 01, 2020, in response to the subject DEA—Anticipated Finding of No Significant Impact for the proposed Mixed-Use Affordable Housing Project at the University of Hawai'i at Mānoa Campus which is being renamed in the Final EA as the Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus. The name is being revised to better reflect the project and avoid confusion regarding the term “affordable”, as the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty. The rental units are not for the general public nor will they be income restricted.

The DEA was originally published in the Office of Environmental Quality Control's September 08, 2020, issue of the *Environmental Notice* and republished in the October 23, 2020, issue to extend the public comment period. Your review of the DEA and participation in the review process is most appreciated. Please see our response to your comments below.

Thank you for informing us that the Hawai'i State Department of Education Noelani Elementary and Stevenson Middle Schools are operating at capacity and will continue to



operate at capacity over the next five years; while Roosevelt High School is operating over capacity and will remain over capacity over the next five years.

While there is potential the Proposed Action may result in additional students enrolling in the schools addressed in your letter, it is anticipated any additional enrollment would be minimal and should not affect current operating capacities. The housing project is intended to serve graduate students and junior faculty; therefore, it is unlikely a substantial number of the proposed rental units would be occupied by families or individuals with school-aged children. Further, in addition to the schools discussed in Section 4.2.1 of the DEA, there are five private schools (Mid-Pacific Institute, Punahou, Maryknoll, Saint Louis and Sacred Hearts Academy) and two Native Hawaiian immersion schools (Ke Kula Kaiapuni 'o 'Ānuenue and Hālau Kū Māna Public Charter School) and one charter school (the University Laboratory Public Charter School) servicing grades K-12 located in the vicinity of the Proposed Action. These facilities would help to further offset the additional need for classroom space in public schools which we understand is currently at capacity at this time.

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your comments and this response will be included in Section 4.2.1.1 and Appendix G respectively, of the forthcoming Final EA. If you have any questions, please contact me at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam  
Director of Planning

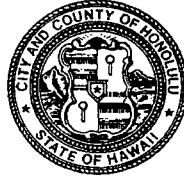
AK:kc

cc: Mr. Ethen Thacher, Director, Development, Greystar  
Ms. Jan Gouveia, Vice President for Administration, University of Hawai'i  
Ms. Robyn Loudermilk, Facilities Development Branch, DOE

**DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET, 11<sup>TH</sup> FLOOR  
HONOLULU, HAWAII 96813  
Phone: (808) 768-8480 • Fax: (808) 768-4567  
Web site: [www.honolulu.gov](http://www.honolulu.gov)

KIRK CALDWELL  
MAYOR



MARK YONAMINE, P.E.  
DIRECTOR

HAKU MILLES, P.E.  
DEPUTY DIRECTOR

November 10, 2020

Belt Collins Hawaii, LLC  
ATTN: Allen Kam  
2153 North King Street, Suite 200  
Honolulu, Hawaii 96822

Dear Mr. Kam,

Subject: Republication of Draft Environmental Assessment Mixed Use Affordable Housing at the University of Hawaii- Manoa Campus 2570 Dole Street Honolulu, Hawaii TMK: 2-8-023:009

Thank you for the opportunity to review and comment. The Department of Design and Construction does not have any comments at this time.

If there are any further questions regarding this matter, please contact me at 768-8480.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Yonamine".

*MY* Mark Yonamine, P.E.  
Director

MY:ms (830425)



March 15, 2021  
2020.70.0200 / 21P-017

Mr. Alex Kozlov, P.E.  
Director  
Department of Design and Construction  
650 South King Street, 11<sup>th</sup> Floor  
Honolulu, Hawai'i 96813

Dear Mr. Kozlov:

**Response to Comments  
Draft Environmental Assessment (DEA)  
Mixed-Use Affordable Housing Project at the  
University of Hawai'i at Manoa Campus  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

Thank you for then-Director Yonamine's letter dated November 10, 2020, in response to the subject DEA—Anticipated Finding of No Significant Impact for the proposed Mixed-Use Affordable Housing Project at the University of Hawai'i at Mānoa Campus which; is being renamed in the Final EA as the Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus. The name is being revised to better reflect the project and avoid confusion regarding the term "affordable", as the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty. The rental units are not for the general public nor will they be income restricted.

The DEA was originally published in the Office of Environmental Quality Control's September 08, 2020, issue of the *Environmental Notice* and republished in the October 23, 2020, issue to extend the public comment period. Your review of the DEA and participation in the review process is most appreciated.

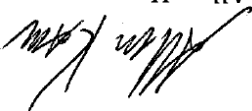
We acknowledge that the Department of Design and Construction has no additional comments at this time.



Thank you for participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in the forthcoming Final EA. If you have any questions, please contact me at 521-5361 or by email at [akam@bchdesign.com](mailto:akam@bchdesign.com).

Sincerely yours,

BELT COLLINS HAWAII LLC



Allen Kam

Director of Planning

AK:kc

cc: Mr. Ethen Thacher, Director, Development, Greystar  
Ms. Jan Gouveia, Vice President for Administration, University of Hawaii



## BOARD OF WATER SUPPLY

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



November 6, 2020

KIRK CALDWELL, MAYOR

BRYAN P. ANDAYA, Chair  
KAPUA SPROAT, Vice Chair  
RAY C. SOON  
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 *ELK*

Mr. Allen Kam  
Belt Collins Hawaii LLC  
2153 North King Street, Suite 200  
Honolulu, Hawaii 96819

Dear Mr. Kam:

Subject: Your Letter Dated October 20, 2020 Requesting Comments on the Republished Draft Environmental Assessment for a Mixed Use Affordable Rental Housing and Childcare Project at the University of Hawaii-Manoa Campus off Dole Street – Tax Map Key: 2-8-023: 009

Thank you for the opportunity to comment on the proposed 400-unit affordable housing, childcare, and commercial project.

The existing water system is adequate to accommodate the proposed twelve to eighteen story mixed-use development. However, please be advised that this information is based upon current data, and therefore, the Board of Water Supply (BWS) reserves the right to change any position or information stated herein up until the final approval of the building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission, and daily storage.

Proposed mixed use developments are required to install separate domestic water meters and laterals serving the residential and non-residential spaces.

Water conservation measures are required for all proposed developments. These measures include utilization of nonpotable water for irrigation using rain catchment, drought tolerant plants, xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets.

High-rise buildings with booster pumps will be required to install water hammer arrestors or expansion tanks to reduce pressure spikes and potential main breaks in our water system.

Mr. Allen Kam  
November 6, 2020  
Page 2

The proposed project is subject to BWS Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit Applications.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

A handwritten signature in blue ink, appearing to read "Ernest Y. W. Lau".

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



March 15, 2021  
2020.70.0200 / 21-018

Mr. Ernest Y.W. Lau, P.E.  
Manager and Chief Engineer  
Board of Water Supply  
630 South Beretania Street  
Honolulu, Hawai'i 96843

Dear Mr. Lau:

**Response to Comments  
Draft Environmental Assessment (DEA)  
Mixed-Use Affordable Housing Project at the  
University of Hawai'i at Mānoa Campus  
Tax Map Key: 2-8-023:009  
2570 Dole Street  
Honolulu, O'ahu, Hawai'i**

Thank you for your letter dated November 06, 2020, in response to the subject DEA—Anticipated Finding of No Significant Impact for the proposed Mixed-Use Affordable Housing Project at the University of Hawai'i at Mānoa Campus; which is being renamed in the Final EA as the Mixed-Use Housing Project at the University of Hawai'i at Mānoa Campus. The name is being revised to better reflect the project and avoid confusion regarding the term “affordable”, as the Proposed Action is to provide below-market rate housing units to UHM graduate students and junior faculty. The rental units are not for the general public nor will they be income restricted.

The DEA was originally published in the Office of Environmental Quality Control's September 08, 2020, issue of the *Environmental Notice* and republished in the October 23, 2020, issue to extend the public comment period. Your review of the DEA is most appreciated. Please see our response to your comments below.

**1. Adequacy of existing water systems and final decision of water availability.**

Thank you for acknowledging that the existing water system is adequate to accommodate the Proposed Action's water needs. We acknowledge that the final decision on water availability will be confirmed by the Board of Water Supply (BWS) upon submittal of a building permit application.



We acknowledge that upon confirmation of water availability by BWS, payment for the Water Systems Facilities Charges for resource development, transmission and daily storage shall apply.

**2. Mixed-use developments are required to install separate domestic water meters and laterals serving the residential and non-residential spaces.**

The Developer is aware that the installation of separate domestic water meters and laterals is required to serve the residential and non-residential spaces. Final metering configuration will be determined during the design process.

**3. Water conservation measures are required for all proposed developments.**

As discussed in the DEA, the Proposed Action will use Leadership in Energy and Environmental Design (LEED) Silver Certified design standards as guidelines to ensure energy and water conservation. The exact type and location of water conservation measures will be determined during the later design stages.

**4. High-rise buildings with booster pumps will be required to install water hammer arresters or expansion tanks to reduce pressure spikes and potential main breaks in the water system.**

If booster pumps are required, water hammer arrestors or expansion tanks will be installed to reduce pressure spikes and potential water main breaks in the water system. As the design progresses, the Developer will ensure compliance.

**5. Proposed Action is subject to BWS Cross-Connection Control and Backflow Prevention Requirements.**

We acknowledge that the Proposed Action is subject to BWS cross-connection control and backflow prevention requirements. These requirements will be integrated into the design as appropriate during the later stages of design, and prior to applying for a building permit.

**6. On-site fire protection requirements.**

As discussed in the DEA in Section 4.1.1.1, the Proposed Action will be built in compliance with the Uniform Fire Code. Upon completion of the Proposed Action's design, civil drawings will be provided to the HFD for review and approval.

Mr. Lau  
March 15, 2021 / 21P-018  
Page 2

Thank you for your comments and participating in the HRS Chapter 343 environmental review process. Your letter and this response will be included in Appendix G the forthcoming Final EA. If you have any questions, please contact me at 521-5361 or by email at akam@bchdesign.com.

Sincerely yours,

BELT COLLINS HAWAII LLC

A handwritten signature in black ink, appearing to read "Allen Kam".

Allen Kam  
Director of Planning

AK:kc

cc: Mr. Ethen Thacher, Director, Development, Greystar  
Ms. Jan Gouveia, Vice President for Administration, University of Hawai'i  
Mr. Robert Chun, Project Review Branch, Water Resources Division, BWS



# **APPENDIX H**

---

2009 LRDP Cultural Impact Assessment

**Cultural Impact Assessment for the  
University of Hawai'i at Mānoa  
Long Range Development Plan Project  
Waikīkī [Mānoa] Ahupua'a, Kona [Honolulu] District  
O'ahu Island  
TMKs [1] 2-8-015:001; 2-8-023:003; 2-9-004:005;  
2-9-023:001 & 026; 2-8-029:001; 2-9-026:001 & 037;  
2-9-027:054; 3-3-056:001 & 004**

Prepared for  
Group 70 International

Prepared by  
Chris Monahan, Ph.D.  
and  
Lehua Ka'uhane

Cultural Surveys Hawai'i, Inc.  
Kailua, Hawai'i  
(Job Code: MANOA 16)

August 2008

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

[www.culturalsurveys.com](http://www.culturalsurveys.com)

Maui Office  
1993 Main St.  
Wailuku, Hawai'i 96793  
Ph: (808) 242-9882  
Fax: (808) 244-1994

## Management Summary

Reference	Cultural Impact Assessment for the University of Hawai'i at Mānoa Long Range Development Plan Project, Waikīkī [Mānoa] Ahupua'a, Kona [Honolulu] District, O'ahu Island, TMKs [1] 2-8-015:001; 2-8-023:003; 2-9-004:005; 2-9-023:001 & 026; 2-8-029:001; 2-9-026:001 & 037; 2-9-027:054; 3-3-056:001 & 004 (Monahan and Ka'uhane 2008)
Date	August 2008
Project Number	Cultural Surveys Hawai'i (CSH) Job Code MANOA 16
Project Location	The Mānoa Campus occupies some 304 acres of land in lower Mānoa Valley, bounded by the Mānoa, St. Louis Heights, Mō'i'ili'i and McCully communities. Its principal physical borders are the Mānoa residential community on the mauka (inland) side, the Wa'ahila Ridge on the Koko Head side, the H-1 Interstate Highway on the <i>makai</i> (seaward) side, and the lower Mānoa and McCully residential communities on the 'Ewa (west) side. The project area is depicted on a USGS topographic map, Honolulu 1998 quadrangle (see Figure 1)
Land Jurisdiction Agencies	State of Hawai'i
Project Description	State of Hawai'i Department of Health / Office of Environmental Quality Control (OEQC), State of Hawai'i Department of Land and Natural Resources / State Historic Preservation Division (SHPD) The 2007 Long Range Development Plan (LRDP) focuses on projects that are on the Capital Improvement Program and/or are anticipated for development within the next 5-10 years. At this time, a total of at least seventeen (17) new buildings and/or building expansions are included in the LRDP (see Figure 4).
Project Acreage	Approximately 304 acres
Area of Potential Effect (APE)	The Area of Potential Effect (APE) consists of the entire approximately 304-acre campus, in the wider cultural and natural context of Mānoa Valley, greater Honolulu and the Kona District.
Document Purpose	The project requires compliance with the State of Hawai'i environmental review process [Hawai'i Revised Statutes (HRS) Chapter 343], which requires consideration of a proposed project's effect on cultural practices and resources. CSH is undertaking this CIA at the request of Group 70 International, Inc. Through document research and (ongoing) cultural consultation efforts, this report provides preliminary information pertinent to the assessment of the proposed project's impacts to cultural practices (per the OEOC's Guidelines for Assessing Cultural Impacts). The document is intended to support the project's environmental review and may also serve to support the project's historic preservation review under HRS Chapter 6E-8 and Hawai'i Administrative Rules Chapter 13-275.

Cultural Impact Assessment for the UH at Mānoa Long Range Development Plan Project

TMKs [1] 2-8-015:001; 2-8-023:003; 2-9-004:005; 2-9-023:001 & 026; 2-8-029:001; 2-9-026:001 & 037; 2-9-027:054; 3-3-056:001 & 004

<p>Community Consultation</p>	<p>Hawaiian organizations, agencies and community members were contacted in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the project area and the vicinity. Organizations and members / representatives of these organizations consulted included the SHPD, the Office of Hawaiian Affairs (OHA), Hui Mālama I Nā Kūpuna o Hawai'i Nei, faculty members of the Kamakūokalani Center for Hawaiian Studies, the Mānoa Heritage Center, the Mānoa Neighborhood Board, Ho'okaha Wai Ho'oulu 'Āina, and Mālama o Mānoa.</p> <p>Background research conducted for this project yields the following results:</p> <ol style="list-style-type: none"> <li>(1) Given its abundant natural resources—including several tributary streams that feed into the main stream and several <i>p n wai</i> (fresh-water springs)—Mānoa Valley has been an attractive place to settle and garden for as long as people have lived on O'ahu (i.e., well over a millennium). Lower Mānoa Valley, within which the campus is located, represents the prime wet-taro-growing area and agricultural heartland of the entire valley.</li> <li>(2) Mānoa is exceedingly rich in places names, <i>wahipana</i> (legendary or storied places) and associated <i>mo'olelo</i> (oral histories), reflecting the valley's elevated cultural and historical significance to Hawaiians, in particular. Important <i>mo'olelo</i> focus on Mānoa's many <i>p n wai</i>, which are directly associated with the exploits of two primary Hawaiian gods, Kane and Kanaloa. These springs include Kānewai (location of the current Kānewai Cultural Garden), Hualani, Waialele—located near the present day athletic field of the Mid-Pacific Institute and associated with Kūka'ō'ō Hetau, Punahou (a.k.a. Kapunahou), Ka'āpu, Wa'aloa and Waiakeakua. The valley is also home to many <i>pu'u</i> (hills, mountains), peaks, ridges and caves—all with associated <i>mo'olelo</i>; these include Wa'ahila Ridge (which defines the eastern border of the valley) and its numerous peaks. Finally, Mānoa is also associated with a variety of other <i>mo'olelo</i>, including "Pikoi the Rat Killer," "Maluae and the Underworld," and "The Woman Who Died and Came Back to Life," as well as famous events and people of the early historic era, including</li> </ol>
-------------------------------	---

<p>(3) The archaeology of lower Mānoa is somewhat problematic in that most of the campus was developed before historic preservation awareness and laws were in place; thus many or most surface-level sites and features once present in the project area have been destroyed and / or damaged by being covered with sediments and structures. Before these historic impacts, however, the campus undoubtedly contained a patchwork of gardens, including many <i>lo'i</i> (stone terraces) and <i>'auwai</i> (irrigation ditches), and house sites, including many small stone enclosures, terraces and platforms. Undoubtedly, there are still subsurface cultural deposits within the campus containing significant historic and cultural resources.</p> <p>(4) Burials have been documented near Keller Hall and along Dole Street, immediately adjacent to the Kānewai Cultural Garden and Kamakūokalani Center for Hawaiian Studies. The latter burials, representing the remains of at least 18 individuals, have been interpreted as a traditional Hawaiian cemetery. It is likely that more burials are located in subsurface deposits within the project area.</p> <p>(5) A recent field inspection of the campus by CSH found a number of possible rock shelters and overhangs in the Wa'ahila Ridge area. Additional study of these possible archaeological sites would have to be conducted in order to more fully understand their function, chronological age and archaeological significance.</p> <p>Community consultation conducted for this project yields the following main concerns:</p> <ol style="list-style-type: none"> <li>(1) Many participants voiced concern about the possibility of encountering as-yet undiscovered cultural and historic sites, including most importantly, human skeletal remains and burials in subsurface deposits. One participant (Dr. Davianna McGregor) also pointed out that the burial site preserve near Keller Hall, which used to be marked by a ginger plant, is no longer being maintained (i.e., the ginger plant is not there anymore).</li> <li>(2) A few participants stated that existing undeveloped</li> </ol>
---

<p>areas, including ridges and valley slopes, should not be developed or impacted in any way, given the already significant loss of such natural portions of the campus and given the importance of retaining a Hawaiian sense of place and landscape integrity. This concern about preserving the last undeveloped portions of the campus extends specifically to the Wa'ahila Ridge area.</p> <p>(3) Many participants voiced concerns about future buildings and projects being more harmoniously designed and integrated into the natural surrounding and themes inherent to the valley. It is important to note that this type of concern is fundamentally a cultural one for Hawaiians, in particular, whose 'world view' and deeper philosophical / spiritual beliefs are based on such concepts as <i>pono</i> (in this case, "right ways" of doing things) and <i>l kahi</i> ("harmony"); among other related concepts (e.g., <i>m lama ' ika</i>, or "taking care of the land").</p> <p>(4) A few participants talked about the importance of understanding and incorporating Hawaiian-language words, phrases and concepts that extends beyond the superficial (e.g., naming buildings).</p> <p>(5) The current Director of Ka Papa Lo'i o Kānewai (a.k.a. Kānewai Cultural Garden) shared his personal knowledge of a well-known master navigator and teacher who previously indicated the large albizia tree at Kānewai Lo'i (which is scheduled to be removed in association with a stream-erosion-prevention project funded by the Federal Emergency Management Agency) could be used to construct a large traditional <i>wa' a</i> (canoe).</p> <p>(6) Many participants talked about the importance of using native plants in future projects.</p> <p>(7) The Wa'ahila Ridge area is an important natural and cultural resource, containing trails, native plants and other significant sites and features (e.g., possible rockshelter and overhangs).</p> <p>(8) A few participants provided detailed accounts of well-documented <i>mo'olelo</i>, <i>wahi pana</i> and other cultural sites in Mānoa; in one case, one participant (Palani Vaughn) suggested there is another, alternative legend associated with the origins of the</p>	
---	--

<p>well-known spring (Ka Punahou, widely attributed to Kāne), but he did not elaborate further on this point.</p> <p>(9) A couple participants called into question the State's (i.e., Department of Land and Natural Resources, Historic Preservation Division) poor record of protecting and preserving important cultural sites in Mānoa, including <i>heiau</i> that have been damaged or compromised by recent construction projects.</p> <p>(10) One participant (Palani Vaughn) suggested the university has not done enough to promote education about the traditions of old Hawai'i in Mānoa; and that it should build a "learning center" (perhaps located at the Center for Hawaiian Studies) that would integrate <i>mo'olelo</i>, <i>wahi pana</i>, the landscape and other cultural and historical information about Mānoa.</p> <p>(11) One participant (Dr. Davianna McGregor) pointed out that the Long Range Development Plan (LRDP) is not detailed enough for meaningful review and comment, and that descriptions such as building "expansion" or "replacement" are too vague. There is concern that the LRDP will be used to guide development 20 years from now, which, given the lack of detail, is problematic.</p> <p>(12) Dr. McGregor also pointed out that there are many significant and commemorative trees on campus that should be systematically catalogued in order to ensure their protection during future development of the campus.</p>	<p>Recommendations</p> <p>CSH recommends the following measures, which, if addressed in a good faith manner, will help mitigate potentially adverse effects of the proposed project:</p> <p>(1) Community consultation participants and the wider Mānoa community should be afforded the opportunity to review the subject draft CIA and offer their input for the final version of this report.</p> <p>(2) Given that the LRDP includes seventeen new buildings, building expansions and other infrastructure improvements, and given the lack of specific plans for these projects, the community should be afforded the opportunity to review and</p>
---	--

	<p>comment on each individual project as details become finalized and as more specific potential impacts (both positive and negative) can be assessed.</p> <p>(3) The University should proactively develop a plan to avoid disturbing burials and historic and cultural sites located in subsurface contexts. Such a plan may include archaeological inventory surveys prior to ground disturbance and / or archaeological monitoring of excavations during construction; specific decisions should be made on a case-by-case basis, in consultation with appropriate government agencies (e.g., SHPD, OHA) and Native Hawaiian organizations and individuals. In particular, every effort should be made to proactively avoid inadvertent finds of human skeletal remains and burials.</p> <p>(4) Planning and design of proposed projects included under the LRDp should incorporate Hawaiian cultural and historical themes and concepts in order to restore and accentuate an authentic Hawaiian sense of place. This should include (a) use of native and Polynesian-introduced plants, (b) integration of <i>mo'olelo</i>, Hawaiian language and other Hawaiian concepts and ideas beyond superficial applications of such information (e.g., building names) and (c) preservation and protection of undeveloped spaces and natural resources.</p> <p>(5) The Wa'ahila Ridge area, one of the only undeveloped places in lower Mānoa Valley, should be carefully preserved and protected from future development, and from modern abuses and damage that have already taken their toll (e.g., soil erosion from "off-road" activities).</p> <p>(6) Ka Papa Lo'i o Kānewai, also known as Kānewai Cultural Garden, should be treated with the utmost care and respect; any plans for future improvements, alterations or development in or adjacent to Kānewai Lo'i should include comprehensive consultation with its director and with the Hawai'i muiākea School of Hawaiian Knowledge.</p> <p>(7) The issue of removing the large albizia tree scheduled for removal in association with the</p>
--	--

	<p>stream-erosion-prevention project should be discussed with the Director of Ka Papa Lo'i o Kānewai, who has indicated the tree may be used to make a large traditional <i>wr'ū</i> (canoe).</p>
--	---



## Table of Contents

Management Summary .....	i
<b>Section 1 Introduction .....</b>	<b>1</b>
1.1 Project Background .....	1
1.2 Document Purpose .....	6
1.3 Archaeological Work at the Project Area .....	7
1.4 Scope of Work .....	7
1.5 Environmental Setting .....	7
1.5.1 Natural Environment .....	7
1.5.2 Built Environment .....	9
<b>Section 2 Methods .....</b>	<b>10</b>
<b>Section 3 Traditional Background .....</b>	<b>11</b>
3.1 Overview .....	11
3.2 Place Names .....	14
3.3 Mo'olelo Associated with Specific Place Names .....	16
3.3.1 Mānoa, Pūaoa, Nu'uana and Pāloa .....	16
3.3.2 Kāne and the Fish of Mānoa .....	17
3.3.3 Pīkoi the Rat Killer .....	17
3.3.4 Pōki, the Dog of Kamehameha I .....	19
3.3.5 Malia'e and the Underworld .....	19
3.3.6 The Woman Who Died and Came Back to Life .....	19
3.3.7 Kānewai Pūnāwai .....	20
3.3.8 Hualani Pūnāwai .....	21
3.3.9 Wailele Pūnāwai .....	21
3.3.10 Punahou Pūnāwai .....	23
3.3.11 Ka'āpū Pūnāwai and Pōhaku .....	27
3.3.12 Wa'āloa Pūnāwai .....	29
3.3.13 Waiakeakua Pūnāwai .....	29
3.3.14 Hills, Mountains, Peaks, Ridges and Caves .....	32
3.3.15 Wa'āhila Ridge .....	33
3.3.16 Kaumana Pōhaku .....	34
3.3.17 Akāka and Kūmauna Peaks and the Princess of Mānoa, Kahala-o-Puna .....	34
3.3.18 Pali Luahine and Kamehameha's Cave .....	37
3.3.19 Puka'ōma'ō, or Puka'ōma'ōma'ō .....	38
3.3.20 'Ulumahu Hill and Kūkaō'ō Heiau .....	44
3.3.21 Pu'u Pueo .....	45
3.3.22 Pu'u o Mānoa (Rocky Hill) .....	46
3.4 Interview with Maka Woolsey about West Mānoa Valley .....	47
3.5 Settlement and Subsistence in Mānoa .....	49
3.6 Streams, Springs and Pōhaku .....	50
3.7 Trails of Mānoa .....	51
<b>Section 4 Historical Background .....</b>	<b>52</b>
4.1 Early Ownership and Use of Mānoa Valley .....	53
4.2 Mid Nineteenth Century and Land Commission Awards .....	54

4.3 The University of Hawai'i at Mānoa Land Commission Awards .....	64
4.4 1900s to Present .....	71
4.5 Prominent Historic Structures .....	79
4.5.1 Mānoa Chapel and Cemetery of Kawaiaha'o Church .....	79
4.5.2 Punahou School (Originally O'ahu College) .....	79
4.5.3 Sacred Heart Church at Punahou .....	80
4.5.4 War'oli Tea Room of the Salvation Army .....	80
4.5.5 Chinese Cemetery .....	81
4.5.6 Lyon Arboretum .....	82
4.6 Mō'ili'i-ili Quarry .....	83
4.7 Early Years of the University of Hawai'i at Mānoa .....	83
<b>Section 5 Archaeological Research .....</b>	<b>88</b>
5.1 Overview .....	88
5.2 Heiau of Mānoa .....	88
5.2.1 Kūkaō'ō Heiau .....	88
5.2.2 Kawapo'o Heiau .....	92
5.2.3 Hakkia Heiau .....	93
5.2.4 Hipawai Heiau .....	93
5.2.5 Maur'oki Heiau (Kamō'ili'i-ili Heiau) .....	95
5.3 Early Archaeological Surveys of Mānoa Valley .....	98
5.4 Post 1960 Surveys of Mānoa Valley .....	102
5.5 Division of Mānoa Valley .....	108
<b>Section 6 Community Consultation .....</b>	<b>109</b>
6.1 Office of Hawaiian Affairs (OHA) Response .....	112
6.2 State Historic Preservation Division (SHPD) Response .....	112
6.3 Mālama o Mānoa .....	112
<b>Section 7 Summaries of Kama'āina "Talk Story" Interviews .....</b>	<b>115</b>
7.1 Al Harrington .....	115
7.2 Konia Freitas .....	115
7.3 Davianna McGregor .....	116
7.4 Jon Osorio .....	117
7.4.1 Wa'āhila Faculty Housing .....	117
7.4.2 Hawai'i mūākea School of Hawaiian Knowledge .....	117
7.5 Makahiapo Cashman .....	117
7.5.1 Hawaiian Language .....	118
7.5.2 Kūpuna of Kānewai .....	118
7.5.3 The Hale .....	119
7.5.4 Kānewai as a Pu'u honua .....	119
7.6 Scott Kakuewa Kikilo .....	119
7.6.1 Trails .....	119
7.6.2 Gathering .....	120
7.6.3 Streams .....	120
7.6.4 Waihipana .....	122
7.6.5 Concerns Regarding the Proposed Project .....	124
7.7 Nāhoa Lucas .....	124

7.7.1 Kānewai	124
7.7.2 On Opening Kānewai	124
7.7.3 Land Use	126
7.7.4 Fresh Water Resources	127
7.7.5 Kānewai Spring	127
7.7.6 The Holowai	128
7.8 Claire Hughes	128
7.8.1 Background	128
7.8.2 Destruction of Cultural Sites	129
7.8.3 Mo'ō	130
7.8.4 Hōlua Sledding at Ptowaina	130
7.8.5 Graveyards	130
7.8.6 Natural Environment	131
7.8.7 Trails	132
7.8.8 Aesthetics	132
7.8.9 Preservation of the Atmosphere	133
7.8.10 Puka'ōma'ō	133
7.8.11 Cultural Sites On Mid Pacific Institute	133
7.8.12 References	134
7.9 Palani Vaughn	134
7.9.1 General Comments	134
7.9.2 Wahipana	134
7.9.3 Burials	136
7.9.4 Hula	136
7.9.5 Trails	137
7.9.6 Recommendations	137

<b>Section 8 Cultural Landscape of the Project Area</b>	<b>138</b>
8.1 Plant Resources	138
8.2 Streams and Fresh Water Resources	138
8.3 Wahipana	139
8.4 Trails	139
8.5 Cultural and Historic Properties and Burials	140
<b>Section 9 Summary and Recommendations</b>	<b>142</b>
9.1 Summary of Results	142
9.2 Recommendations	144
<b>Section 10 References Cited</b>	<b>147</b>

## List of Figures

Figure 1. USGS topographic map, Honolulu 1998 quadrangle, showing University of Hawai'i at Mānoa campus lands	2
Figure 2. Map showing Tax Map Keys [1] 2-8-015:001; 2-8-023:003; 2-9-004:005; 2-9-023:001 & 026; 2-8-029:001; 2-9-026:001 & 037; 2-9-027:054; 3-3-056:001 & 004	3
Figure 3. Aerial photograph of University of Hawai'i at Mānoa campus lands	4
Figure 4. Long Range Development Plan 2007 Update	5
Figure 5. Soils map of University of Hawai'i at Mānoa (data from Foote et al. 1972)	8
Figure 6. "Pre-Māhele Moku and Ahupua'a" map and study of 1987 by the Hawaiian Studies Institute showing Mānoa as part of Waikīki Ahupua'a	12
Figure 7. 1929 Photograph of the Inter-Island Airway's amphibian plane, Hawaii, passing over Mānoa Valley (Hawai'i State Archives)	13
Figure 8. Outline of 1882 map by E. D. Baldwin, showing topographic points and traditional land units in Mānoa Valley	15
Figure 9. Identified as "Kua'i o Mānoa" at Waiale Spring (from Bouslog et al. 1994:134)	23
Figure 10. Kapunahou Spring (photograph from Bouslog et al. 1994:132)	25
Figure 11. Possible (approximate) locations of Puka'ōma'ō, house of Queen Ka'ahumanu (tracing from 1882 map of Mānoa Valley, surveyed by E. D. Baldwin)	42
Figure 12. Portion of Coulter's (1931) population-estimate map for O'ahu in 1853 showing approximately 350 people in Mānoa Valley (each symbol represents 50 people)	49
Figure 13. Waterfalls in the back of Mānoa Valley as seen from Kanānā (photograph from Bouslog et al. 1994:4)	50
Figure 14. Early nineteenth century trails on the southwest coast of O'ahu (illustration from [1] 1959-93), showing locations of some place names in Mānoa	51
Figure 15. Kotzebue map of 1817 showing vicinity of project area (should be understood as somewhat schematic)	56
Figure 16. LaPlace map of 1855 showing vicinity of project area (should be understood as somewhat schematic)	57
Figure 17. 1882 E. D. Baldwin map, showing Land Commission Awards and Grants in Mānoa Valley	58
Figure 18. Makai portion of 1882 E. D. Baldwin map with Land Commission Awards outlined in red	59
Figure 19. 1847 Hawaiian Government Survey map, surveyed by Theophilus Metcalf	60
Figure 20. 1881 O'ahu Island Government Survey map	66
Figure 21. 1882 E. D. Baldwin map showing vicinity of project area	67
Figure 22. 1887 W. E. Wall map showing vicinity of project area	68
Figure 23. 1897 M.D. Monsarrat map showing vicinity of the project area	69
Figure 24. 1899 O'ahu Island map showing vicinity of project area	70
Figure 25. Checkerboard taro fields on the floor of Mānoa Valley	72
Figure 26. 1919 Fire Control map showing vicinity of project area	73
Figure 27. 1927 US Geological Survey map showing vicinity of project area	74
Figure 28. 1938 map showing vicinity of project area	75
Figure 29. 1943 War Department map showing vicinity of project area	76
Figure 30. 1953 U. S. Geological Survey map showing vicinity of project area	77

Figure 31. 1956 map showing vicinity of project area .....	78
Figure 32. 1866 Photograph of Punahou School, Photograph attributed to Charles Burgess (photograph from Foster 1991: 32) .....	81
Figure 33. Entrance to Line Yee Chung Chinese Cemetery in Mānoa (photograph from Bouslog et al. 1994) .....	82
Figure 34 View of the campus in 1917 from Wa'ahila Ridge (Adapted from Kobayashi 1983:23) showing the two permanent buildings, Hawaii Hall (1912) is at center, the beginnings of the Young Engineering quad (still 4/5 intact by the present Campus Center) is at left of the relocated wooden building moved up from Young Street .....	85
Figure 35. 1926 aerial photograph showing seaward end of present University Avenue ending at Metcalf St. (extreme left), George Hall (1925) inland of Gartley Hall (1922; center), with Hawaii'i Hall (1912) at right and the Cooke Field Track (vicinity of present Sinclair Library) in the fore. The future Bachman Hall area is still in farm plots .....	86
Figure 36. 1929 aerial photograph showing the western half of the present campus still in fields but University Avenue has now been extended seaward (extreme left, middle) and there has been significant clearing seaward of the Cooke Field track associated with construction of the original Gym (1928) just NW of the present Bachman Hall .....	86
Figure 37. 1939 aerial photograph showing the campus dominated by the old quad (lower right) of Hawaii'i (1912), Gartley (1925) and Dean (1929) and the new Crawford Hall (1938). The brand new Hemenway Hall (1939) is just seaward and old Gilmore Hall (1935-1973) with its two wings, anchors the east end of campus at left .....	87
Figure 38. In this 1949 aerial photograph the campus is dominated by the central Hemenway Hall (1938), the old Gym and the on-going construction for Bachman Hall are near University and Dole streets, the University Farms still dominate the eastern campus .....	87
Figure 39. Overlay of 1822 E.D. Baldwin map of Mānoa Valley on modern street map, showing possible <i>heiau</i> locations .....	89
Figure 40. 1908-1913 Corps of Engineers Fire Control map, showing L-shaped structure, possibly Hipawai Heiau, on land later <i>mauka</i> of the St. Francis High School Campus .....	96
Figure 41. 1883 S.E. Bishop map of Pa akea, showing location of a <i>heiau</i> near Mauoke Spring .....	99
Figure 42. Project area (in red) in relationship to archaeological sites identified in Sites of O'ahu (Sterling and Summers 1978) .....	100
Figure 43. Circa 1900 photograph of artifacts displayed at Punahou College including the wooden idol (left foreground) possibly found in a cavern in Rocky Hill .....	101
Figure 44. Previous archaeological studies in the vicinity of the project area .....	103
Figure 45. Previously identified archaeological sites in Mānoa Ahupua'a (project areas with no identified sites are denoted by author and year of report) .....	104
Figure 46. Podmore map (1916 or 1917) of the boundary between the 'ili of Wā ahila and Kānewai showing an ' <i>ūawai</i> ' and a "cave called Koana" .....	105
Figure 47. Office of Hawaiian Affairs response letter dated April 24, 2008 .....	114
Figure 48. Wailele Spring .....	121
Figure 49. Punahou Spring .....	122
Figure 50. Ka U'i o Mānoa .....	123
Figure 51. Old Kalaie Road Bridge .....	140

## List of Tables

Table 1. Land Commission Awards for Mānoa Ahupua'a .....	61
Table 2. Previous Archaeological Investigations in Mānoa Ahupua'a .....	106
Table 3. Community Consultation .....	110

## Section 1 Introduction

### 1.1 Project Background

At the request of Group 70 International, Inc., Cultural Surveys Hawaii'i, Inc. (CSH) prepared this Cultural Impact Assessment (CIA) for the University of Hawaii'i at Mānoa's Long Range Development Plan (LRDP). The project area consists of the entire approximately 304-acre campus located in Mānoa [Waikīkī] Ahupua'a, Kona District, Hawaii'i [TMK: (1) 2-8-015-001, 2-8-023-003, 2-9-004-005, 2-9-023-001 & 026, 2-8-029-001, 2-9-026-001 & 037, 2-9-027-054, 3-3-056-001 & 004]. The project area consists entirely of State of Hawaii'i-owned land.

The campus is located in lower Mānoa Valley, bounded by the Mānoa, St. Louis Heights, Mō'ili'ili and McCully communities. Its principal physical borders are the Mānoa residential community on the *mauka* (inland) / north side, the Wa'alahia Ridge on the Koko Head (east) side, the H-1 Freeway *makai* (seaward) / south side and the lower Mānoa and McCully residential communities on the 'Ewa (west) side (Figures 1–3).

The proposed LRDP focuses on projects that are on the Capital Improvement Program and/or are anticipated for development within the next 5-10 years (Figure 4). At this time, at least seventeen (17) new buildings or renovation/expansion projects are proposed:

- Kennedy Theatre Expansion
- Parking Structure at Kennedy Theatre
- Instruction Building at Henke Hall Site
- Campus Center Expansion to Northeast
- Law School Expansion
- I.T.S. - Bilger Hall Addition, Phase II
- Research Space - Infill South Courtyard of Biomedical Building
- Klum Gym Replacement
- Instruction Building - College of Education
- Media Facilities at KHET Site
- Parking Structure IIB/Bookstore
- Faculty Housing – Wa'alahia Ridge or Mauka Campus
- Research Buildings – North and East of Biomedical Building
- Research Buildings - Mauka Campus
- Johnson Hall - Replacement Dormitory
- Hale Noelani - Replacement Dormitory
- School of Hawaiian Knowledge

These projects address current space and activity needs on campus. They are not based on any anticipated increase in enrollment over the next planning period. Enrollment declined from an all-time high of over 22,000 students in 1972 to a low of approximately 18,000 in 1987. Since then, enrollment has slowly increased reaching 20,644 students in the fall of 2007. Enrollment is projected to remain relatively stable through 2012, as indicated by a 2007 estimate by the University of Hawaii'i's Institutional Research Office. The anticipated opening of the new West O'ahu Campus is also anticipated to reduce the pressure on undergraduate enrollment.

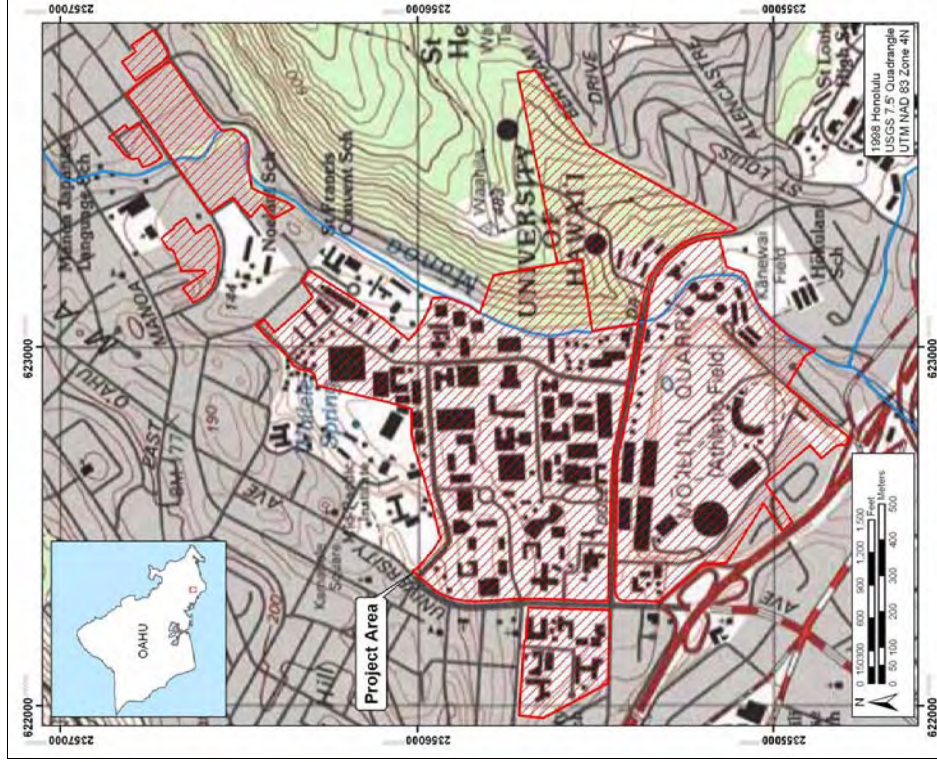


Figure 1. USGS topographic map, Honolulu 1998 quadrangle, showing University of Hawaii'i at Mānoa campus lands

Cultural Impact Assessment for the UH at Mānoa Long Range Development Plan Project

TMKs [1]2-8-015-001; 2-8-023-003; 2-9-004-005; 2-9-023-001 & 026; 2-8-029-001; 2-9-026-001 & 037; 2-9-027-054; 3-3-056-001 & 004

1

Cultural Impact Assessment for the UH at Mānoa Long Range Development Plan Project

TMKs [1]2-8-015-001; 2-8-023-003; 2-9-004-005; 2-9-023-001 & 026; 2-8-029-001; 2-9-026-001 & 037; 2-9-027-054; 3-3-056-001 & 004

2



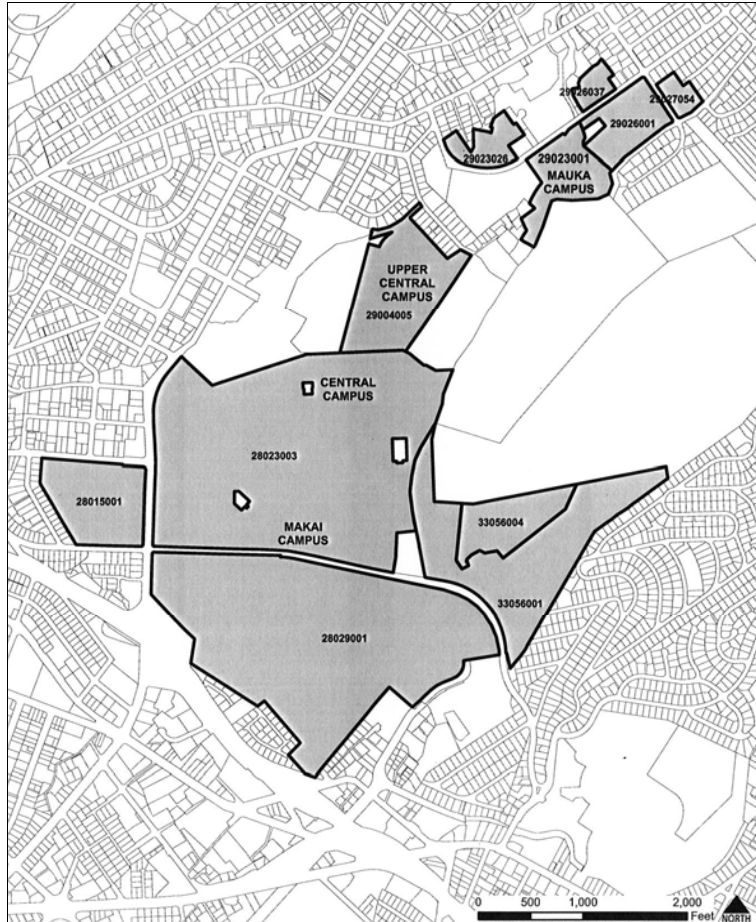


Figure 2. Map showing Tax Map Keys [1] 2-8-015:001; 2-8-023:003; 2-9-004:005; 2-9-023:001 & 026; 2-8-029:001; 2-9-026:001 & 037; 2-9-027:054; 3-3-056:001 & 004

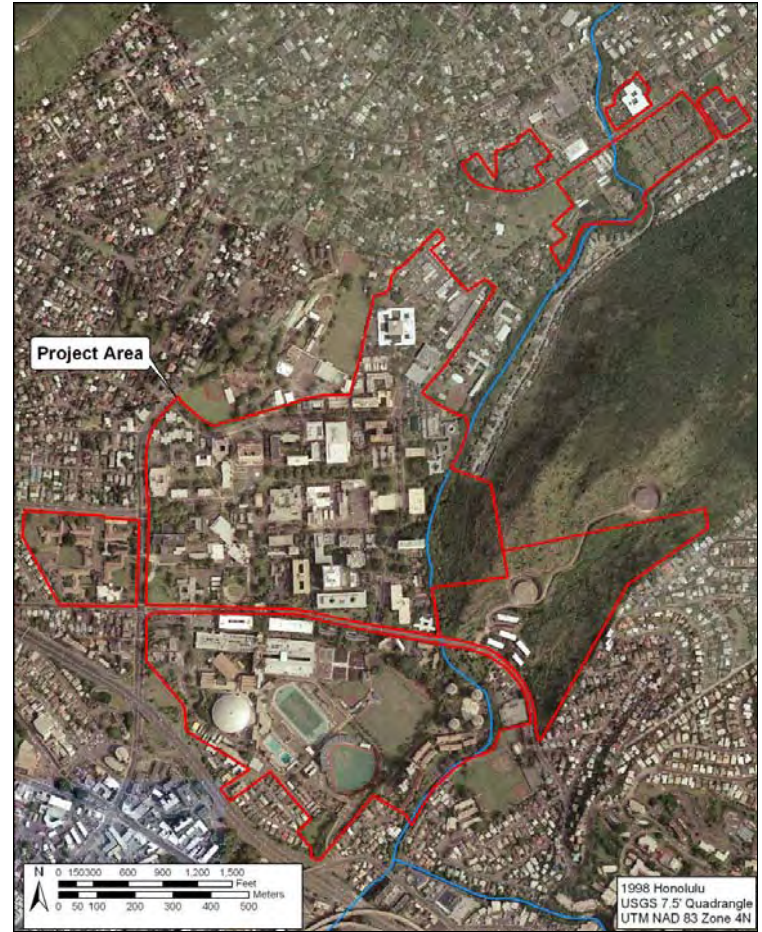


Figure 3. Aerial photograph of University of Hawai'i at Mānoa campus lands





Figure 4. Long Range Development Plan 2007 Update

Rather than enrollment growth, campus development at the University of Hawaii'i-Mānoa (UHM) is now stimulated by current facility needs and the desire to provide a more complete campus community experience. Universities across the country have focused on enhanced environments for learning, working, and living. Campuses of the future envision uses and activities not unlike that of any vital urban center.

Graduate and research space needs will also continue to fuel growth on the Campus. In a pattern typical of other major universities, research and administrative support facilities are related to the availability of research funding rather than enrollment. Overall, extramural funding at Mānoa has increased by 50% over the past ten years. In 2003, the Top American Research Universities ranked UHM among the top 50 public universities in federal research funding. New laboratories, offices and library resources will continue to be required to support evolving graduate work and research activities.

While not all research and graduate education will be campus-bound, as evidenced by the John Burns School of Medicine in Kaka'ako, telescopes atop Mauna Kea and research facilities on Coconut Island, the great majority of research and graduate student activities seek a direct relationship to the resources of the Campus. While distance learning and virtual teaching methods also promise changes to higher education, their immediate impact appears to be at the lower division and undergraduate level. Institutions such as UHM with large upper-division and graduate programs, successful professional schools and burgeoning research programs are anticipated to grow in-place. UHM's challenge is to use the opportunity afforded by this growth to achieve higher levels of quality in its physical and academic environment. The 2007 Update to the LRDP will serve as guidance towards this important goal.

### 1.2 Document Purpose

The project requires compliance with the State of Hawaii'i environmental review process [Hawaii'i Revised Statutes (HRS) Chapter 343], which requires consideration of a proposed project's effect on cultural practices. CSH is conducting this CIA at the request of Group 70 International, Inc. Through document research and (ongoing) cultural consultation efforts this report provides preliminary information pertinent to the assessment of the proposed project's impacts to cultural practices and resources (per the OEQC's Guidelines for Assessing Cultural Impacts). The document is intended to support the project's environmental review and may also serve to support the project's historic preservation review under HRS Chapter 6E-8 and Hawaii'i Administrative Rules Chapter 13-275.

### 1.3 Archaeological Work at the Project Area

CSH is also conducting a companion Archaeological Literature Review and Field Inspection Report (CSH Job Code MANOA 15) for the subject project. The literature review and field inspection is designed to identify archaeological site types and locations in the project area, and to allow for future archaeological-work recommendations, if applicable. The goal is to identify cultural resources and historic properties, from a specifically archaeological perspective, and to provide recommendations related to the State of Hawaii'i's historic review process. Results from the Archaeological Literature Review and Field Inspection Report are included in this document.

## 1.4 Scope of Work

The scope of work for this CIA includes:

1. Examination of cultural and historical resources, including Land Commission documents, historic maps, and previous research reports, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal, and other resources or agricultural pursuits as may be indicated in the historic record.
2. A review of previous archaeological work at and near the subject parcel that may be relevant to reconstructions of traditional land use activities; and to the identification and description of cultural resources, practices, and beliefs associated with the parcel.
3. Consultation and interviews with knowledgeable parties regarding traditional cultural practices at or near the parcel; present uses of the parcel; and / or other (non-Hawaiian) practices, uses, or traditions associated with the parcel.
4. Preparation of a report summarizing the results of these research activities.

## 1.5 Environmental Setting

### 1.5.1 Natural Environment

Mānoa Valley was formed during the volcanic eruptions that formed the Ko'olau Mountains starting about 10 million years ago. This volcanic activity and the following erosion caused amphitheater-headed, deep V-shaped valleys on the southeast coast of O'ahu, which are separated by sharp, high ridges. The Ko'olau volcano reactivated approximately 250,000 years ago, pouring lava into the valley. This eruption built up new cones, including Pu'u 'Ohia (Tantalus) in the upper valley, and lower down the smaller cones of Pu'u Kākea (Sugar Loaf), Pu'u 'Ualaka'a (Round Top) and Pu'u o Mānoa (Rocky Hill). The erupted lava cascaded down the western ridge of Mānoa Valley. This filled in the V-shaped valley, giving it a more rounded U-shaped appearance (Bouslog et al. 1994:4-5).

According to Foote et al. (1972), soils within the campus are mostly varieties of clay loam (Figure 5). The northeast portion of the campus and most of the central campus is Makiki Stony Clay Loam (MIA) with some Tantalus Silty Clay Loam (TCC) in the northwest corner. The Wa'ahila Ridge area north of Dole Street includes a large portion of Rock Land (rRK) as well as Ka'ena Very Stony Clay (KanE) and Pāmoa Silty Clay (PID) soils. South of Dole Street the southeastern portion of campus includes Kawaiāpāi Clay Loam (KIA). The quarry area that dominates the lower campus was developed to exploit a thick dense deposit of ephelime-melilite (so-called "blue stone") basalt.

A notable feature of the dominant Makiki Stony Clay is "that there are enough stones to hinder cultivation" making up 15% of the soil by volume (Foote et al. 1972:92). Basalt outcrops are common. Several of the other soil types (rRK, KanE, PID) are described as having poor "workability" owing to the very sticky, very plastic nature of the clay. The best agricultural soil

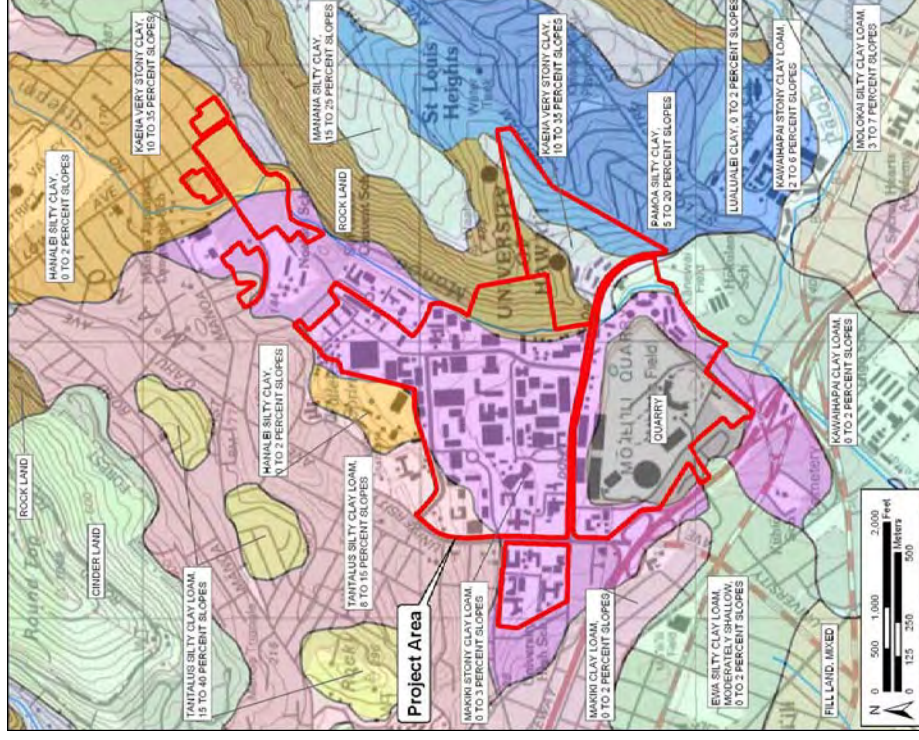


Figure 5. Soils map of University of Hawai'i at Mānoa (data from Foote et al. 1972)

appears to be the Kawahāpai Clay Loam – which rather notably lies in a very small area where the Kānewai taro *lo'i* (probably a traditional Hawaiian gardening complex) is located.

The Mānoa sub-basin watershed covers 6,150 acres and 12 miles of stream. Aihualama, Waihi, Lua'alaea, Nānu'apo, Wa'aloa, and Waiakeakua are the tributary streams in the upper valley that merge at an elevation of 400 feet into the main Mānoa Stream. Half-way down the center of the valley, the Sugar Loaf eruption has pushed the streambed to the extreme east of the valley. Before the construction of the Ala Wai Canal, the lower portion of the stream, called Kālia Stream, flowed in a westerly direction, then made a wide bend to the east where it joined the Pālolo Channel in the general vicinity of the present-day Date Street near the *makua* side of the Ala Wai Golf Course.

Annual rainfall at the head of Mānoa Valley can reach up to 160 inches per year. At the lower boundary, rainfall is only 35 inches per year. The valley is often swept with strong winds that bring rain, including *ala'eli*, the “cool wind of the land,” and *k kea*, a “stormy wind” (Bouslog et al. 1994:6). However, it is the Tuahine or Kuahine rain, a misty rain, for which the valley is most well known.

Before Hawaiian settlement, the slopes of Mānoa's ridges were probably covered with a dense forest, dominated by *hi'a lehua* (*Metrosideros macrospus*), *koa* (*Acacia koa*), and *loulou* (the native fan palm, *Pritchardia* spp.). The undergrowth would have included shrubs such as *naupaka kuahivi* (*Scaevola* spp.), ferns such as *h pu'u* (*Cibotium splendens*), *ama'u* (*Stadleria* spp.), and *pala'* (also known as *palapala'*, *Sphenomeris chinensis* syn. *chusana*), and vines such as *'ie'ie* (*Freycinetia arborea*) (Bouslog et al. 1994:8). Mānoa, due to its broad, well-watered valley, was probably settled early by the Hawaiians, who probably cleared much of the lower areas near streams for wetland taro cultivation.

### 1.5.2 Built Environment

Since its founding in the early twentieth century, nearly the entire campus has been developed with numerous buildings, facilities and infrastructure. The only major areas of undeveloped land still remaining are located east of Mānoa Stream near the base of Wa'ahila Ridge (leading up to St. Louis Heights) and across from the existing East-West Center.

## Section 2 Methods

Historical documents, maps and existing archaeological information pertaining to the sites in the vicinity of this project were researched at the CSH library. Information on Land Commission Awards was accessed through Waihona 'Aina Corporation's Māhele Data Base (www.waihona.com). The State Historic Preservation Division, Office of Hawaiian Affairs, O'ahu Island Burial Council, and community and cultural organizations in Mānoa were contacted in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the project area and the surrounding vicinity. The names of potential community contacts were also provided by colleagues at CSH and from the authors' familiarity with people who live in or around the project area. The cultural specialist conducting research on this assessment employed snowball and judgment sampling methods, an informed consent process and semi-structured interviews according to standard ethnographic methods (as suggested by Bernard 2005). Some of the prospective community contacts were not available to be interviewed as part of this project. A discussion of the consultation process can be found in Section 6 on Community Consultations. Please refer to Table 3, Section 6 for a complete list of individuals and organizations contacted.

## Section 3 Traditional Background

### 3.1 Overview

Mānoa is sometimes treated as a portion of the *ahupua'a* of Waikīki and sometimes treated as a distinct *ahupua'a*. It seems rather unlikely, given its geographic location and its overall size and general physiography, that Mānoa was its own land-locked (i.e., separate from Waikīki) *ahupua'a* in pre-Contact times. The well-known “Pre-Māhele Moku and Ahupua'a” map and study of 1987 by the Hawaiian Studies Institute, which shows “major land divisions of O'ahu prior to the *M hele* of 1848,” does not show Mānoa as its own separate *ahupua'a* (Figure 6). It seems unlikely that Mānoa's residents would not have enjoyed unencumbered access to the seashore in pre-Contact times, although this may have changed with the late 18<sup>th</sup> century invasions of O'ahu from the windward islands (Maui and Hawai'i). Regardless, given its abundant natural resources—including several tributary streams that feed into the main Mānoa Stream and several *p n wai* (fresh water springs)—the valley has clearly been an attractive place to settle and garden for as long as people have lived on O'ahu (Figure 7).

At various times throughout this long history, Mānoa was home to kings and other high-ranking *ali'i* (chiefs), as described in legends, land records, early maps of Honolulu and other documents. Two chroniclers of historic Hawai'i talked about Kamehameha I's affinity for Mānoa:

The places Kamehameha farmed and the houses he lived in at those farms were show places. His farmhouses in Nuuanu stood several hundred fathoms away from the right side of Kapahala, a knoll on the western side of Nuuanu Street and Hanaikamalama House. Perhaps the location was chosen to enable him to look both inland and seaward to his food patches. Some elevated houses seem to have been for that purpose. So it was with Puupueo [today known as Roundtop, on the west side of the valley], directly below Ualaka'a. (T 1959:69)

Thrum also stated that Kamehameha often stayed in Mānoa Valley:

It is evident that Mānoa has for several generations past, been held in high esteem by Hawaiians of rank. Kamehameha I was no stranger to the valley, and it early became the favorite resort of his immediate household and followers. (Thrum 1892:113)

This section begins by describing some of the many place names in the valley. Compared with other locations on O'ahu and the rest of the Hawaiian Islands, Mānoa is relatively rich in place names; this abundance of names—and their associated *mo'olelo* (oral histories) and legends, is a reflection of the valley's elevated cultural and historical significance to Kānaka Maoli (Native Hawaiians), in particular. For example, there are many *mo'olelo* and legendary accounts of Mānoa's *p n wai*, which are directly associated with the exploits of two primary Hawaiian gods, Kāne and Kanaloa. These springs include Kānewai (location of the current Kānewai Cultural Garden), Hualani, Waialele—located near the present day athletic field of the Mid-Pacific Institute and associated with Kūka'ō'ō Heiau, Punahou (a.k.a. Kapunahou), Kā'aipū,

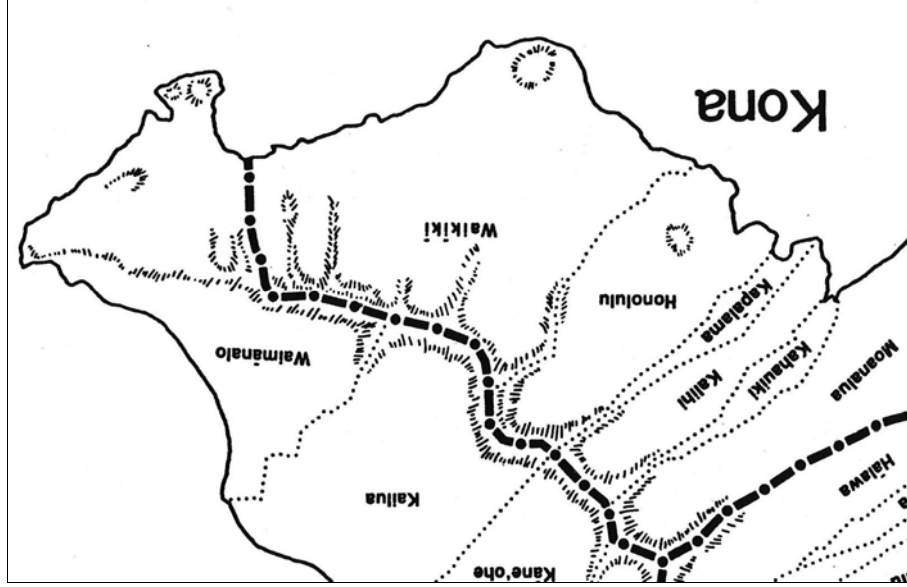


Figure 6. “Pre-Māhele Moku and Ahupua'a” map and study of 1987 by the Hawaiian Studies Institute showing Mānoa as part of Waikīki Ahupua'a





Figure 7. 1929 Photograph of the Inter-Island Airway's amphibian plane, Hawaii, passing over Mānoa Valley (Hawai'i State Archives)

Wa'aloa and Waiakeakua. The valley is also home to many *pu'u* (hills, mountains), peaks, ridges and caves—all with associated *mo'olelo* and legendary accounts; these include Wa'ahila Ridge (which defines the eastern border of the valley) and its six peaks [Keenapoi, Pu'u Pia, Pūkele, Paliluahine (also known as Kapaliluahine or Pali Luahine) Akāka and Kūmauna], 'Ulumalu, Pu'u Pueo ("Roundtop") and Pu'u Mānoa. Mānoa is also associated with a variety of other *mo'olelo* and legends, including "Pīkoi the Rat Killer," "Mahuāe and the Underworld," and "The Woman Who Died and Came Back to Life;" as well as famous events and people of the early historic era, including Kamehameha I (and his famous dog Poki), Ka'ahumanu and Boki (Governor of O'ahu under Kamehameha I and brother of Kalaninʻōiō).

### 3.2 Place Names

Translations presented without attribution in this subsection are from Pūku'i et al. (1974), unless indicated otherwise. Figure 8 shows some place names of Mānoa Valley from an 1882 map by E. D. Baldwin.

The literal meaning of the word **Mānoa** is "vast," or "wide and vast" (Pūku'i cited in Sterling and Summers 1978:281). Along with Pauoa, Nu'uamu and Pāloa, Mānoa is one of the famous "valleys of the rainbow," as described in the legend of "The Lady of the Moon" (see below).

Place names for the many *p n wai* of Mānoa typically refer to the sacred nature of *wai* (fresh water), and stress the relationship between the water-giving gods (primarily Kāne, but also his companion Kanaloa) and *k naka* (people) whose lives depend on it. According to numerous accounts (e.g., Williams 1935), the *kaona* (hidden or more subtle meaning) for **Kānewai** (location of the current Kānewai Cultural Garden) is "the healing waters of Kāne," reflecting a widespread traditional belief in its curative properties. According to Bouslog et al. (1994:134), **Hualani** means "dug up by heaven," but this interpretation may be problematic because the word for "to dig" (as in "dug up") is actually *hual'i*. According to Pūku'i and Elbert (1986), one of the primary meanings of *hual* is "fruit, tuber, egg, produce, yield, ovum, seed...[etc.]," which suggests a more accurate interpretation for Hualani Pūnāwai is something like "heavenly fruit" or "seed" or "fruit" or "seed of heaven." In any case, this is an evocative name for a *p n wai*. **Waiāle** has been interpreted as "flying water" (Bouslog et al. 1994) or "waterfall" (Pūku'i et al. 1974), and can also mean something closer to "leaping water," based on one of the primary meanings of the word *lele*, as in a spring that bursts forth with water. **Punahou** means "new spring," and in some older references it is called Kapunahou (or "the new spring"). **Ka'āpū**, literally "the eating together," is associated with a famous "supernatural woman" who lived under a stone there (see several other oral-historical associations for this spring, below). **Wa'aloa**, "the long canoe," and **Waiakeakua**, "water [used] by god," are two more *p n wai* in Mānoa associated with many famous supernatural phenomena and events.

The five tributaries that fed into the main Mānoa Stream in the lower valley are: 'Aihualama (literally, "eat the fruit of the lama tree"), **Waihi** (literally, "trickling water"), **Nāniu'apo** (literally, "the grasped coconuts"), **Lua'alaea** (literally, "pit [of] red earth"), and **Waiakeakua** (literally, "water provided by a god").

There seven principal waterfalls in the back of Mānoa Valley are: **Wai'ihiriki** (literally, "small trickling water"), **Wai'ihī nui** (literally, "big trickling water"), **Lua'aulaea**, **Nāniu'apo**, **Wa'aloa**, **Kahuwai'iki** (literally, "little water tender," as in one who takes care of the water) and **Waiakeakua**.

Some of the primary *pu'u*, ridges, peaks and caves include: **Wa'ahila** (which Pūku'i et al. 1974 do not define, but note is the name of a famous rain in the valley), **Keenapoi**, **Pu'u Pia** (literally, "arrowroot hill"), **Pūkele** (literally, "muddy"), **Paliluahine** (also known as Kapaliluahine or Pali Luahine), **Akāka**, **Kūmauna** (these latter two are associated with "The Princess of Mānoa" (Kahala-o-Puna), **'Ulumalu**, **Pu'u Pueo** (literally "owl hill") and **Pu'u Mānoa**.





going to Wa'aloa and Waiakēkua, others turning to the swamp, called Lua'ala'e, or the Gulch of the Mud Hen, and on to Waihi, where most of the fish disappeared. (Bouslog et al. 1994:138)

After having provided the people of Mānoa with fish, the two gods traveled back to Konahuanui to rest. They started for home at Waihi, climbing the pathway of the 'Opihī at 'Aihualama and ascending the heights to Konahuanui, where they sailed for the east and above the clouds (Bouslog et al. 1994:137-138).

### 3.3.3 Pikoī the Rat Killer

Another legendary beauty of Mānoa is described in the "Legend of Pikoī the Rat Killer." In this tale, a chief on Kaua'i had eight children, six god daughters or demi-gods called *k ko'o*, who were rats (*k ko'o* is the name for the Hawaiian bow used to hunt rats), one *kamaka* daughter and one *kamaka* son. The *kamaka* son, Pikoī, became a noted rat hunter on Kaua'i, using a bow and arrow to kill the rats. The *kamaka* daughter, named Ka-ūi-o-Mānoa ("The Beauty of Mānoa") moved to O'ahu and married the chief of Mānoa, Pāwā'a. They made their home in Mānoa Valley at Kahaloa and also had the land called Kaho'iwai. One day Pikoī and his father decided to travel to O'ahu to visit their sister at Mānoa. While in O'ahu, Pikoī wandered from Mānoa toward the harbor at Honolulu, and joined several *ali'i* in the sport of rat shooting. Pikoī impressed a chiefess and her followers by shooting at a hidden rat, and striking and entangling the whiskers of three rats in one shot. He then proceeded to kill an additional number of rats in one shot, all strung along the length of the arrow.

The king of O'ahu, Kākūihewa, heard about this boy and wanted to find him. Only the caretaker of the high chiefess had seen the boy and she suggested to the king that he command all of the men of O'ahu, each district for one year, to come to his residence at Ulukou in Waikīki. In the sixth year it was the turn of Mānoa, and Pikoī, his father, and Ka-ūi-o-Mānoa made ready to travel to Waikīki with other men of the lands of Mānoa, mentioned in the following passage.

She [Kauīomanoa] went from their home at Kahaloa, (a place in the upland of Mānoa) to a spot called Kaho'iwai. There she made four lehua leis, two for the neck and two for the head and went home. They made ready to go to the lowland with their food which the stewards carried. All the members of Pawa'a's household went, none remained, and so it was with all the families in the upland of Mānoa. The men and women of every locality in Mānoa went, from Ka'apakahua, Kawai'ele, Puahia, Kanewai, Kamo'i'i'i'i and Kamoku. (Kau 1865; translation in Hawaiian Ethnological Notes, Vol. II, p. 713)

In another rat-shooting contest, Pikoī again impressed the king, who made him his personal rat-hunter and gave him a grass hut in Mānoa, which Pikoī returned to with his relatives to live (Westervelt 1963a:171-172).

### 3.3.4 Pokoī, the Dog of Kamehameha I

Pu'u Pueo was also a favorite haunt of Pokoī, the wonder-dog of O'ahu, whose home was on a little knoll behind Punahou College (now enclosed in the small Mānoa Park) (Taylor 1953). This dog was owned by Kamehameha I. By tradition, the dog was brought to the islands on the American trading ship *Eleonor*, which visited the islands in 1790 (Dorothy Barrere, cited in

Sterling and Summers 1978:285). Pokoī, or Bokoī, is a transliteration of the English name "boss," and is not a Hawaiian name (Pūku'i and Elbert 1986:338). According to legend, this dog was prayed to death (Titeomb 1969:22). After Kamehameha's death, the dog was deified and worshipped; tales of the dog were possibly confused with other tales of other spirit dogs. The legends of this dog may date to Kamehameha's time, or may have been borrowed from older legends of a dog apparition whose name is lost (Dorothy Barrere, cited in Sterling and Summers 1978:285).

Beckwith (1940:346) says that Pokoī has been confused with the legend of the ghost dog Kaupō and other spirit forms. In these legends, Pokoī is a dog-like creature "spotted or brindled in color and very long in body, who guards a certain section of Honolulu, but may appear in other places."

Travelers report having seen the creature and having made a long detour to avoid it. It sometimes appears as a form in the clouds, either resting or in motion. A foreigner reports seeing, as he was entering Moanalua valley from Honolulu just as the moon was rising, "a shapeless white form," a mist "convulsed with movement," which passed over the treetops from the Koolau range, preceded as it came by "the wailing of dogs" and followed as it passed by "a deathlike stillness." (Beckwith 1940:346)

The spirit form of Pokoī may be connected with signs in the sky that the Hawaiians call ' *uli*, which are animal shapes seen in the clouds that were used to foretell the movements of the chiefs. The *ali'i* believed that these denoted the presence of their *'aumakua* (guardian spirits) in the heavens (Beckwith 1940:346-347). Pokoī had magic powers – he could stretch himself along the mountains, his hind feet on the mountain ridge and his head in the valley below, just as:

... the night clouds, sometimes darkened by falling rain, sometimes enriched by the halo of lunar rainbows, and sometime glorified by the silver moonlight, continue to stretch from peak to peak along the mountains and watch over all the various forms of life in the valleys below. (Westervelt 1963a: 88-89)

Pokoī is also seen at night in Mānoa, especially if one is standing on Pōhaku Kīkēkē, the bell-stone located in Kamō'i'i'i. By tradition, the bell stone gives clear vision to one who stands on it. If while standing on the stone, one wishes to see Pokoī, then he appears "stretched along the mountain and silvered by moonlight" (Westervelt 1963a: 87-88).

The association of Pokoī with Mānoa may be due to the dog's shared name with Bokoī Kama'ule'ule, the high chief who owned much of the land in lower Mānoa. High chief Bokoī's original name was 'Ilio-punahale, meaning "favorite dog"; when Kamehameha got the dog "Boss" (Bokoī or Pokoī) he changed the name of the young chief from 'Ilio-punahale to "Boss," which was pronounced as Pokoī or Bokoī (Day 1984:13). Pūku'i et al. (1974:188) say that many dogs were named Pokoī around the time of Bokoī's birth, including dog guardians (*āia'i*). Some Hawaiians say that the dog Pokoī is the spirit of Bokoī, who watches over and protects Mānoa Valley (Westervelt 1963a:88).

In recent times, several people still report seeing a strange dog that they identify as Pokoī. In 1971, a visitor at the Bishop Museum saw a white puppy, which began to grow larger and more terrifying as it ran towards him. He did not stop running from this apparition until he got to the Kamehameha Shopping Center (Grant 1996:215).

going to Wa'aloa and Waiakēkua, others turning to the swamp, called Lua'ala'e, or the Gulch of the Mud Hen, and on to Waihi, where most of the fish disappeared. (Bouslog et al. 1994:138)

After having provided the people of Mānoa with fish, the two gods traveled back to Konahuanui to rest. They started for home at Waihi, climbing the pathway of the 'Opihī at 'Aihualama and ascending the heights to Konahuanui, where they sailed for the east and above the clouds (Bouslog et al. 1994:137-138).

### 3.3.3 Pikoī the Rat Killer

Another legendary beauty of Mānoa is described in the "Legend of Pikoī the Rat Killer." In this tale, a chief on Kaua'i had eight children, six god daughters or demi-gods called *k ko'o*, who were rats (*k ko'o* is the name for the Hawaiian bow used to hunt rats), one *kamaka* daughter and one *kamaka* son. The *kamaka* son, Pikoī, became a noted rat hunter on Kaua'i, using a bow and arrow to kill the rats. The *kamaka* daughter, named Ka-ūi-o-Mānoa ("The Beauty of Mānoa") moved to O'ahu and married the chief of Mānoa, Pāwā'a. They made their home in Mānoa Valley at Kahaloa and also had the land called Kaho'iwai. One day Pikoī and his father decided to travel to O'ahu to visit their sister at Mānoa. While in O'ahu, Pikoī wandered from Mānoa toward the harbor at Honolulu, and joined several *ali'i* in the sport of rat shooting. Pikoī impressed a chiefess and her followers by shooting at a hidden rat, and striking and entangling the whiskers of three rats in one shot. He then proceeded to kill an additional number of rats in one shot, all strung along the length of the arrow.

The king of O'ahu, Kākūihewa, heard about this boy and wanted to find him. Only the caretaker of the high chiefess had seen the boy and she suggested to the king that he command all of the men of O'ahu, each district for one year, to come to his residence at Ulukou in Waikīki. In the sixth year it was the turn of Mānoa, and Pikoī, his father, and Ka-ūi-o-Mānoa made ready to travel to Waikīki with other men of the lands of Mānoa, mentioned in the following passage.

She [Kauīomanoa] went from their home at Kahaloa, (a place in the upland of Mānoa) to a spot called Kaho'iwai. There she made four lehua leis, two for the neck and two for the head and went home. They made ready to go to the lowland with their food which the stewards carried. All the members of Pawa'a's household went, none remained, and so it was with all the families in the upland of Mānoa. The men and women of every locality in Mānoa went, from Ka'apakahua, Kawai'ele, Puahia, Kanewai, Kamo'i'i'i'i and Kamoku. (Kau 1865; translation in Hawaiian Ethnological Notes, Vol. II, p. 713)

In another rat-shooting contest, Pikoī again impressed the king, who made him his personal rat-hunter and gave him a grass hut in Mānoa, which Pikoī returned to with his relatives to live (Westervelt 1963a:171-172).

### 3.3.4 Pokoī, the Dog of Kamehameha I

Pu'u Pueo was also a favorite haunt of Pokoī, the wonder-dog of O'ahu, whose home was on a little knoll behind Punahou College (now enclosed in the small Mānoa Park) (Taylor 1953). This dog was owned by Kamehameha I. By tradition, the dog was brought to the islands on the American trading ship *Eleonor*, which visited the islands in 1790 (Dorothy Barrere, cited in

### 3.3.5 Malua'e and the Underworld

In the tale of "Maluae and the Underworld" (Kamakau 1991b: 51-52; Westervelt 1963b: 14-20), Malua'e was a farmer who lived at the back of Mānoa Valley.

He kamaka mahiai o Maluae no uka o Manoa, o Kamaloaohookau kona 'āina, a o ka mata kana ai kanu nui, he maia na ko akua, a ua mahiai i na a e ae na laua me kana keiki a me kana wahine. (Kamakau, Ke Au 'Ōko'a, Oct. 13, 1870)

Translation:

Malua'e was a planter in the uplands of Manoa, Oahu. Kamaloaohookau was his land. He raised a lot of bananas as food for the gods, and he planted other food, 'ai, for himself, his wife, and his son. (Kamakau 1991b:51)

Malua'e always honored the gods by placing some of his crop on an altar to the gods, Kāne and Kamaloa, before taking the rest home.

His bananas grew rapidly by the sides of the brooks, and yielded large bundles of fruit from their tree-like stems; his taro filled small walled-in pools, growing in the water like water-lilies, until the roots were matured, when the plants were pulled up and the roots boiled and prepared for food; his sweet potatoes . . . were planted on the drier uplands. (Westervelt 1963b: 14)

He had a son called Ka ali'i, meaning "rolling chief," who was a careless, rollicking child. One day the boy grew hungry and ate some of the bananas that Malua'e had placed on the altar to the gods. In anger, the gods struck the boy dead. Malua'e found the dead boy with a piece of banana still stuck in his mouth. He was so distraught that he lay down on his bed and refused to eat or drink. The gods regretted their action, remembering the long devotion of Malua'e.

The gods gave Malua'e a spirit body (*ano kino lani*) and a marvelous hollow cane (*ko ōko'o mana*) called Maku'uko'o, which contained food to give him strength, a war club and spear to fight off ghosts, and a piece of lava for fire. They took him to Moanua where there was an entrance to Pō (*po pau ole*), the underworld. After many confrontations with ghosts who tried to impede his journey, he found his son "down in the *papa-kai*" (the foundation of Pō), still choking on the banana. The father caught the spirit of the boy and began his way up, again, fighting ghosts with his club and spear and gaining strength from the god's food. Finally they were completely surrounded by the ghosts, and Malua'e poured out the lava from the hollow cane, causing the spirits to flee. The father stuffed his son into the hollow cane and escaped from the underworld. He made his way home and returned the boy's spirit to his body. Forever after, both the father and son took food to the altar of Kāne and Kamaloa to honor and thank them.

### 3.3.6 The Woman Who Died and Came Back to Life

An historic account of a woman who died in Mānoa was told in the newspaper *Alaha Aina* in 1903 and recounted in the book "The Legend of Kewalo." The account was given by Mrs. Lydia Kaloio and by Mrs. Malie Kamana, the half-sister of Mrs. Keakealani Maikini, the woman who died.

Keakealani was very ill and asked to see all her immediate relatives. When they had assembled she told them that she was about to die, and soon after she expired

in the arms of her sister Malie. They laid her on a couch. *Rigor mortis* set in, but after three hours Malie noticed one of her sister's big toes jerk once violently. Another hour passed, then the woman croued like a rooster just learning to crow. Two hours later a slight breathing was noticed, after which she was heard to murmur "I wai (water)." Water was poured carefully between her clenched teeth. After another two hours she opened her eyes and spoke. (Green and Pūku'i 1936:120)

Keakealani dreamt that she rose from out of her body, ran from the house, and began to ascend the slopes of Punchbowl.

On the summit were many people making merry. Just below the summit on the west side stood a dark man who waved to her to hasten and join the crowd; on the east side stood an older relative and immediately behind her aunt she saw her sister Anela who had died some years before. The aunt beckoned and her sister called "Sister, come!" She noticed that her aunt wore a short blue *miu umu'u* which she had been fond of in life. She hurried toward them and as she drew near, her aunt gave her a violent push which sent her rolling down to the foot of the hill. She rose to reclaim the hill, but her aunt kept shoving and pushing her toward her home in Mānoa until she had returned to the place where her body lay. Then the aunt forced her to reenter her body through the big toe. The ankle-joint looked to her like a dark cave and she would have drawn back, but her aunt forced her on. She continued up through her body, each joint looking to her more terrifying than the last. The torso was like an ink-black cavern. At last as air filled her lungs, she felt herself crow and she awoke from her deathlike sleep. (Green and Pūku'i 1936:120-121)

Sometime later Keakealani felt death coming again. She insisted that a new purple silk *holo'oku* (loose dress) be made for her to wear, since she had learned during her last illness that what one wore at the time of death is what one would wear in the spirit world.

### 3.3.7 Kānewai Pūnāwai

Kōmāhuanui is the highest peak in the Kō'olau Mountains and is the northwest corner of the Mānoa Ahupua'a boundary. It was the home of the gods Kāne and Kamaloa. It was where their parents came on their way to and from the east from above and from the right (*mai kahiki a mai ka hīwama'i*), meaning it was the starting and resting point of the gods since the first formation of the islands (Bouslog et al. 1994:133). Kāne and Kamaloa fished in the ocean off Kahala (east of Mānoa Ahupua'a). One day the two gods traveled inland, looking for fresh water to wash off the saltwater on their bodies. They came to Kamō'il'i'i, and Kamaloa said:

"Where are the springs and streams of living waters? Our people are always singing the chants of your life-giving springs and stream. They tell me that they are in the clouds, the sun and the bowels of the earth. Can you give it to me now?...Kane turned to Kamaloa saying "Be patient, thirsty one." (Bouslog et al. 1994:134-135)

Kāne struck his staff into the soil and the water flowed so that the sand was washed from their bodies. The white sand is still found in the area today. The spring is called Kānewai, or "the

waters of Kāne," and the stretch of sand is called Kanaloa. At this place Kanaloa placed a stone, called Pōhaku-kū-ula, a god to attract and snare fish (Bouslog et al. 1994: 134).

This underground pool Kānewai was known for the healing powers of its waters (Williams 1935). These legends do suggest that the locale of Kānewai would have attracted the infirm, some of whom may have expired there in the course of seeking healing and have been interred in the area. It is also notable that myths of the waters of Kāne emphasize a theme of eternal return, a theme played upon in the account of the repeated subterranean passage of fishes to Kānewai from the sea. Such associations may have increased the perceived auspiciousness of the area as a place to inter the dead.

This spring is also mentioned in a legend concerning the Hawaiian pig god, Kamapua'a, who made both a spring at Kānewai and a spring called Pa'akea (also called Kumulae or Haussten Spring) in the adjacent land section of Kamō'ili'i'i.

### 3.3.8 Hualani Pūnāwai

Kāne and Kanaloa traveled further up the valley and Kanaloa suggested that Kāne again use his stick to produce water. Kāne struck the cane deep into the earth to bring forth a crystal water. Kāne commanded that a spirit guard the water gourd bottle Hualani, meaning "dug up by heaven." The name given to the land around was Maka'ilo, "the dog's watchful eye" (Bouslog et al. 1994:134).

### 3.3.9 Waialele Pūnāwai

Kāne and Kanaloa then traveled to the northwest, near to the present day athletic field of the Mid-Pacific Institute. He struck the ground so forcefully that the water came flying up, so it was called *waialele*, or "flying water." This spring became a fishpond filled with 'o'opu (used by Hawaiians to describe a large variety of fishes included in the families Eleotridae, Gobiidae, and Blenniidae), *anae* (mullet, *Mugil cephalus*), and *awa* (milkfish, *Chanos chanos*). Kāne put a *kapu* (prohibition) on this spring so that no woman should bathe in it, and he commanded that a sacrifice at Waialele should always be a yellow dog, "*he 'ilo ka m hui puakea.*"

One *mo'olelo* related to Waialele Spring concerns a *larg p hauku*. This

"Near this spring stands a huge rock known as Kua'i o Mānoa, which at times took the form of a magnificent young chieftain whose favorite past time was surfing. From his home at Waialele he would watch the ocean and, when he saw the *nalu* *ōpū*, the budding waves, he would lift his surfboard and wander down to Ulukou at Waikīki. When he saw the shadows of the Mānoa hills fall across the valley, he would say to the surf, "E ho'i i kua'i o Mānoa ua ahiahi!" "I must return to the beauty of Mānoa. It's evening." (Bouslog et al. 1994:134)

This version of the story is found in *M noa The Story of A Valley* (Bousloug, et al). The spelling of Kua'i is questionable in that it is very similar to Kau'i [the beauty]. Pūku'i defines "kua i" as "to remove internal organs of animals, disembowel; to clean, as chickens." *Kau'i* rather than *kua'i*, would be more logical especially when looking at the author's translation of "*hua i*" as "beauty" in the saying "E ho'i i kua'i o Mānoa ua ahiahi- I must return to the beauty of Mānoa. It is evening." Also the above version states that the "huge rock" is "near this [Waialele] spring," but the accompanying photo is of a smallish rock located inside the spring (Figure 9).

Mo'olelo similar to the one described above, identifies a large rock to the west of Waialele Spring as Ka U'i o Mānoa, and describe a very similar story with the exception that "chieftan" is a chiefess. See Nakuiua's version below.

An alternate origin for the name of Waialele ("leaping water") Springs was recorded by Mrs. Emma Nakuiua:

The old belief was that these clear, bright waters had their origin on the heights above the valley, on the western side, at Kakea, and came leaping down through underground channels, to appear again in the Springs of Waialele, from which the adjacent lands took their name. (Nakuiua 1907:25)

According to Nakuiua (1907:24), there was one *heiau* and a sub-*heiau* associated with Waialele. The *heiau* was called Ka-ua-la'a, meaning "the sacred rain." It was located under a grove of mango trees towards the eastern and lower ridge of Mānoa. A picture of this stone structure is printed in the August 1907 Mid-Pacific Student, so it must have been still extant at that time. Thrum does not record a *heiau* in Waialele in his list of the *heiau* of O'ahu in 1907, but it may be one of the *heiau* mentioned by Thrum in his list of forts built by the chief Kūali'i after his victory over the *menehune* at Kūka'ō'ō Heiau in Mānoa. Thrum (1892:112) reported: "After Kūali'i obtained possession [of the menehune fort at Kūka'ō'ō], he made it the principal temple fort of a system of heiaus, extending from Mauoiki, Puahia luna and lalo, Kumuohia, Kaulaala, Waialele, and one or two other points between Kaulaala and Kukao'o."

A land area adjacent to Waialele is Kauwala'a, which by Nakuiua's description and the similarity of the name (Ka-ua-la'a) is probably where the *heiau* was located.

Here once stood the heiau or temple devoted to the cult of Ua-ku-a-hine or the "Rain of Manoa." She was a fabled goddess who was married to a human consort and here they dwelt together. In the lifetime of her husband she took on human form. But this happy union must perforce come to an end with the death of the poor mortal husband. The goddess, in her grief at this loss, dissolved in mist and rain, and floated away to her home in the Manoa range, where she dwells immortally on the ridge of Kumauna. From this vantage ground, high up amid the cold-capped peaks, she sweeps down daily, along the mountain side to her old home at Ka-ua-laa. (Nakuiua 1907:24)

The sub-*heiau* of Ka-uwalo-malie was located west of Ka-ua-laa, across the baseball field on the Mid-Pacific Institute under a grove of Pride-of-Indian trees. The son of the goddess Ua-ku-a-hine was the high priest of both of these *heiau*. The smaller *heiau* was named for his daughter, Ka-uwalo-malie (meaning "the place of the silent crying"), "... whose application suggests the grief of her grandmother, the goddess, as she melted away into the rain of the valley on the death of her husband" (Nakuiua 1907:24-25).

The high priest also had a granddaughter, called variously Kumu-hau-nani (meaning "the beautiful hau tree") or Kau'i o Mānoa (meaning "the beauty of Mānoa"). She lived on a rounded knoll on the grounds of the Mid-Pacific Institute. She was betrothed to the chief Kāne-wai, who lived in Mō'ili'i. She lived in sacred seclusion at Waialele, but longed to be allowed to go with the other maids of Mānoa to surf at the Waikīki coast. Her grandfather, the high priest, granted her desire, with the condition that she should return at a certain hour to her *kapu*-guarded home at Waialele.

With this condition she willingly complied in spirit, but, at times, amid the excitement of the ocean – sport, she would forget the directions given and tarry beyond the stated hour. Then her retainers would seek their charge and would call to her in words which were destined to live through coming years. “E hoi, e ke Ui o Manoa, ua ahi-ahi.” “Come, come home, O Beauty of Manoa; it is now sunset.” “Ke hea mai nei ka Ua-Ku-a-hine ia oe.” “The rain Ku-a-hine is calling to you.” (Naktina 1907:26)

This poetic phrase became a common saying and was used to call out to friends as they wended their way homeward once the days' work was done.

Another reference says Kau'iomānoa lived near the large rock called Kau'iomānoa. She leant “her mantle of beauty to the Mānoa girls, as the valley was famous for its beautiful young women thirty years ago” (Dictionary of Hawaiian Localities, Saturday Press, Dec. 15, 1883).



Figure 9. Identified as “Kua'io Mānoa” at Waialele Spring (from Bouslog et al. 1994:134)

### 3.3.10 Punahou Pūnāwai

Punahou is also associated with the gods Kane and Kanaloa (Figure 10). Kane and Kanaloa came to O'ahu on a pointed cloud from the land of Kuaihelani, one of Kane's twelve islands in the heavens. They traveled from Hanauma to Waikiki. Kanaloa would often complain of hunger,

and Kane, a kindly, courteous god, would strike the earth with his staff. This would cause water to gush forth, which they would use to mix their 'awa (kava, *Piper methysticum*) drink. As described by Pūku'i and Curtis (1951):

Ma ko laua alahēle, ua hoomaha ihola ma ka puu o Keapapa (o keia kahi e kapa ia nei o Punahou) a hoomaka hou no o Kanaloa e ne i wai, me ka hooluhua pu noho i ka hiki ole ia Kane ke hoopii mai i wai na laua. Aka ihola o Kane, no ka meha, ua lohe aku nei kona pepeiao i ka halulu o ka wai ma kookoo, a hu maila ka wai a nui. Ua lilo keia wai i mea e hoopomaikai i na kanaka o ka aina, oiai, ua ololo ia o keia ke kumu a ka wai i koaa ai kala wai ma kahi i kapa ia nei i keia wa o McCully Tract. Ua kapa ia keia wai a Kane, o Ka-puna-hou.

Translation:

On their way they rested on the Keapapa hill (at the place now called Punahou) and again Kanaloa teased his brother for water and challenged his ability to produce it. Kane smiled, for he could hear the noise of water within the hill, and he thrust his staff into the ground and the water gushed forth in abundance. It has been a great blessing to the natives of that region . . . This water of Kane was called “The new spring,” Ka-puna-hou. (Pūku'i and Curtis 1951:112-115)

There is a second version of the origin of the spring.

A chief Kaha'akea once lived in the Ka'ala Mountains and had two twin children, a boy named Kauawa'ahila (Wa'ahila Rain) and a girl Kauaktiowao (Mountain Mist). The children's mother had died, and Kaha'akea married a woman named Hawea to help take care of his children. Hawea also had a son, but since he was deformed and ugly, she soon grew jealous of the twins' beauty. When Kaha'akea went on a visit, Hawea began to persecute her step-children:

Driven to desperation they fled to Konahuanui, the mountain peak above the Pali of Nuuanu, but were soon discovered and driven away from there by the cruel Hawea. They then went to the head of Manoa Valley. The step-mother was not at all pleased at their getting out of the way of her daily persecutions, and searched for them everywhere. She finally tracked them by the constant appearance of rainbows at the head of Manoa valley, those unfailing attendants of rain and mist. The children were again driven away and told to return to Kaala where they would be constantly under her eye, but the children ran and hid themselves in a small cave on the side of the hill of Kukaoo whose top is crowned by the temple of the Menehunes. Here they lived some time and cultivated a patch of potatoes, their food at this time being grasshoppers and greens. The greens were the leaves and the tender shoots of popolo, aheahea, pakai, laulele and potato vines by rolling hot stones around among them in a covered gourd. This is called the “puholoholo.” . . . When the potato tubers were fit to be eaten, the brother (Waahila-rain) made a double “imu,” having a “kapu,” or sacred side for his food and a “noa” or free side for his sister. The little cave that was their dwelling was also divided in two, a sacred and a free part for brother and sister. The cave can still be seen and the wall of stone dividing it in two was still intact a few years



ago, as also was the double imu. In older times it was tabooed to females to appear at any eating place of the males. (Nakuina 1893:102)

The stepmother drove them away again, and the children found two caves in the rocky hill back of Punahou, one occupied by the brother and the other by the sister (Thrum 1998:133-136).

In his [Kauawa'ahila] trips around the neighborhood for fruit and greens he had noticed a large rain-water pond to the east of the hill on which they dwelt. This pond was called Kanewai. Here he sometimes came to snare wild ducks. He also had met and knew the Kakea water god, a moo, who had charge of and controlled all the water sources of Manoa and Makiki Valleys. This god was one of the ancestors of the children on the mother's side, and was on the best of terms with Waahila rain. The boy paid him a visit, and asked him to assist him to open a watercourse from the pond of Kanewai to a place he indicated in front of and below the caves inhabited by himself and his sister. The old water god not only consented to help his young relative, but promised to divide the water supply of the neighboring Waialele spring, and let it run into the watercourse that the boy would make, thus insuring its permanence. (Thrum 1998:136-137)



Figure 10. Kapunahou Spring (photograph from Bouslog et al. 1994:132)

The *mo'ō* (water spirit) made a passage to open the underground. Kauawa'ahila dove into Kanewai Pond and came out at the place now called Kapunahou (the new spring). The gushing water soon formed a basin, which Kaukiowao was most surprised to see upon awakening. Kauawa'ahila planted some *kaalo* (taro) patches around the spring, which attracted people to live nearby and become vassals to the twins. At the return of the children's father, Kaha'akea learned of the enmity of Haeae; he killed her and then killed himself. Rocky Hill (also called Kaha'akea), the home of the children, was named for him (Thrum 1998:137-138).

A third story for the origin of Punahou spring concerns an old couple who lived at the foot of Rocky Hill in Mānoa. At a time of drought, the husband had to walk far into the valley for famine food, such as *k* (or *l*) roots and ferns. The woman, Kealoha, had to walk all the way to Kamō'ilī'ili to fill her gourd with water. One night, after another tiring walk to Kamō'ilī'ili, the woman had a dream. In the dream, a man asked why she was crying. She replied that she was so weary from the daily long walks to get water. The man told her that she did not have to go again, because there was a spring below a *halala* (pandanus or screw pine, *Pandanus odoratissimus*) tree near their home. Kealoha told her dream to her husband, Mukaka, the next day, but he made light of it. That night, Mukaka had a similar dream; the man told him of the spring under the *halala* tree and told him to make an offering of a red fish, wrapped in *l* leaves, and cooked. The next morning, Mukaka made the offering and pulled up the *halala* tree. When the water began to gush, he cried out "Ka punahou! The new spring!" (Pūku'i and Curtis 1960:83-87).

A version of this story with more details was told by W.F. Alexander in 1911, who recorded that it was told to his grandfather by an old Hawaiian and his wife that had a *kuleana* (small family parcel) close to the spring of Kapunahou. In this version, the ceremony and offering are described:

... He [Mukaka] went home with the fish, lighted the imu and cooked them in ti leaf wrappers. In the meantime the people gathered to eat the fish that had been prepared.

The ancestral god was brought from its customary place with the ipu-o-Lono container. When the fish was cooked, the offering to the god was put into the ipu-o-Lono. The remainder was eaten by the people. (*Ka N. pepa K 'oko'a* 1915:5; translation from Hawaiian Ethnological Notes, Bishop Museum Archives)

From this legend, Punahou School adopted for their seal the *halala* tree with two taro leaves in the water flowing under it (Alexander and Dodge 1941:35-36).

The stone Pōhaku'ua was a boundary marker placed at Punahou soon after this area was given to the American missionaries by Chief Boki. An appropriate stone was sought to serve as a marker and was found on the northeastern slope of Rocky Hill, nine feet long, seven feet high above ground, and two feet below ground. The workers dug hard the first day, but barely dislodged the stone. The second day, they were surprised to find their labors of the first day had been in vain, and the stone had worked its way even more firmly into the ground. The chief consulted a *kahuna* (priest) who said:

Kuka kamailio iho nei lakou i keia mea ano e, a noonoo iho nei he pohaku kupua keia. Hele aku nei ke alii i ke kahuna e ninau pono ai, a i maila no hoi ke kahuna, "Aole kela he pohaku, aka, he kanaka! Mai kena aku e hele, e hoomalimali mua ia, a pau ia, nana no e hele." Kulihihi mai ke kahuna e hana i paima. E kii i puaa

hiwa, nū hiwa, awa hiwa, moa hiwa, ia ula, poi lehua, a e kono i na kanaka hana e ai me no poe i akoakoa mai. A i ka pau ana o ka paina, eli hou aku nei na kanaka, o ka hemo no ia o ua pohaku nei.

Translation:

They discussed the marvel and came to the conclusion that his was a kupua stone. The chief consulted a kahuna. He said, "This is not a stone, it is a man. He is not to be forced, but coax him and he will go." The kahuna proposed that a feast be prepared consisting of black pig, black awa, green coconut, black fowl, red fish, and pink poi, and the workmen and a number of others be invited to attend. After the feast the digging began again and the stone was soon out of the ground. (Green and Pūku'i 1936:116-117)

Chief Pāki (father of Bernice Pauahi Bishop), a powerful man said to be seven feet tall, lifted the stone upright. With men supporting the stone on each side, the stone moved of its own accord to its prepared place at Punahou. Laura Green and Mary Pūku'i relate the later destruction of the stone:

Some years later, Pohaku-loa was broken up. Ammie Harris thinks that a part of it was removed to the Kapi'olani Maternity Home and that the remainder is still to be seen standing at the front gate of the Punahou campus. (Green and Pūku'i 1936:117)

Another version of this *pūhaku* is found in the archives of the Bishop Museum (Henriques Collection, 1925 Sites Commission Tablet).

The Pohakuloa stone was worshipped in the old days by Hawaiian women, who prayed for the endowment of their children with wisdom and strength.

Appropriately, this stone was used as part of the wall when Punahou School was founded in 1830. The tabu which endangered anyone who helped move the stone was removed by Kamehameha III, who challenged the tabu by sitting on the giant Pohakuloa stone—twelve feet long and weighing several tons. By the grace of the king's presence, the Hulumanu or body guard of the king were able to carry the stone to its place in the wall. The men were "numerous as ants tugging at a kernel of corn." Pohakuloa was broken up in 1856. This is the largest piece of Pohakuloa that is in existence today. (Henriques Collection, 1925 Sites Commission Tablet, cited in Sterling and Summers 1978:283)

### 3.3.11 Ka'āipū Punāwai and Pōhaku

After Kāne created the spring at Kapunahou, Kanaloa suggested that they return to their home at Kōnāhuanui. They traveled through Mānoa over 'Āihualama to the heights of Pu'u o Mānoa (Rocky Hill) onto the plains to the land of Kulumalu (where the Castle home was later built on 'Ulumalu Hill), which means "the shade of the breadfruit."

Kulumalu was *o'io'io* *o n' akua*, the rest temple of the gods and the place where the food for the gods was cooked. Kanaloa, as usual, complained of being thirsty and Kāne answered gently, "Wait, thirsty one, until we get to Kala'i" . . . [now the

site of the Salvation Army's Mānoa headquarters]. Kala'i, known as the road of the gods, is where they rested and dined. At Kala'i, Kanaloa still chided Kāne by saying, "Where are the springs of living water, Kāne? My mouth is dry and I shall wither up." Kāne then turned to Kanaloa and said, "Let us go down the knoll and there we will find the entrance to the lizard goddess' home, where you will find cool waters to quench your thirst." After they had walked a few rods for Kala'i and down a hollow place, Kane struck his magic came into the ground and there burst forth the spring of Ka'āipū, "the girdle of the cluster," meaning a gateway. Kāne then created a supernatural guardian called Ka'āipū, who was formed into a stone fish with its mouth wide open to guard the spring. This spring was the first gateway to the home of the Kihaniuilulūmoku, the Mo'o or lizard goddess of Mānoa, who lived in the upper springs with her other fairy companions. These were the wives of Kāne and Kanaloa. Ka'āipū the stone god is still on the premises of Ka'āipū. It is said that Ka'āipū often changed its form when it dwelled in the spring it would be an eel and represented a beautiful mermaid; at other times it would take the shape of a warrior. (Bouslog et al. 1994:135-136)

Thrum (1892:115) also discusses this sacred stone of Mānoa:

Kaipu figures also in the valley legends as possessing a stone of peculiar merit and power, from which the land takes its name, and was believed by the natives to bring good or ill-fortune to its possessor according to the honor bestowed upon it. The stone is about four feet in length, somewhat tapering toward one end, and having a rather smooth bore of about three inches in diameter running through its entire length. The larger end has sufficient irregular regularities to furnish those superstitiously inclined with the idea of a face, the bore mentioned serving for its mouth, into which sacrifices of food used to be placed. Thus the god Kaipu held power over Manoans in days gone by.

Ka'āipu was an akua wahine pohaku. A local pohaku god in Manoa, with an opening on the top of his "Head," which was considered as another mouth. (Malia Kamana, as told by Mrs. M. Pūku'i, 3/16/54, to C.C.S., cited in Sterling and Summers 1978:285)

A third legend says that Ka'āipū was the name of an area noted for the sweetness of its mountain apples. A great wizard who lived there was turned into the stone (Dictionary of Hawaiian Localities, *Saturday Press*, Dec. 15, 1883). This stone was in the 'ili of Ka'āipū, which was later owned by a farmer Carlos A. Long, who used the land for a fruit orchard; and then owned by the Montanos, who used it to graze the cows for their business, the Ka'āipū Dairy. It later became the site for the Salvation Army's Wat'oli Tea Room.

This spring is also called Pū'ahu'ula (Sterling and Summers 1978:288, citing an article on "O'ahu Place Names," *H k o Hawaii*, Feb. 11, 1930). The famous female *mo'o*, Kīha-nui-lū-lū-moku (great island-shaking *mo'o*), lived here; she had eel, lizard, and woman forms, and made plants thrive in Wa'a-loa ravine. Pū'ahu'ula means "feather-cloak spring" (Pūku'i et al. 1974:190-191).

### 3.3.12 Wa'aloa Pūnāwāi

After leaving the Pū'ahu'ula springs of the *mo'ō* Kahamuilānīlūmoku, Kāne and Kanaloa traveled up the valley, past Puka'oma'oma'ō, later the residence of Queen Ka'ahumanu.

They traveled on to Kahoiwai, where again the petulant Kanaloa said, "Where are your waters, Kāne? Your waters do not follow you!" Then Kāne gently said to Kanaloa, "Thirsty one, why not drink from this stream of rushing water?" The mischievous Kanaloa answered, "I do not want these waters. I want the waters that you profess to bring forth by your magic power. I am wandering with the god of bubbling springs and still do not have water to mix my 'awa.'"

Kāne turned to Kanaloa for the last time and said most kindly, "Wait a little longer, thirsty one, and I will give you of the life-giving water of Wa'aloa, or 'long canoe,' at the garden of Kīhamuilānīlūmoku, where she happily spends her hours near the falls of *n nītu a p*, the coconut trees of night. At this place her retinue cultivates the *kalo*, *h 'i'o* and sweet potato in our canoe for food." (Bouslog et al. 1994:136)

The gods entered a ravine shaped like a canoe and Kanaloa struck his cane into the bowsprit of the canoe, creating Wa'aloa Springs. Kāne and Kanaloa stayed awhile in this place in the company of the mermaids at the garden of Kīhamuilānīlūmoku.

A Hawaiian chant also speaks of Wa'aloa as the garden owned by a legendary woman named Kīhamuilānīlūmoku-wahine. This woman, in a company of mermaids and *menehune*, went to her garden each month a few nights before the full moon. They planted taro, sweet potatoes, bananas, *h 'i'o*, bamboo, *k. huala*, ginger, *lehua*, and other plants. As they worked they chanted:

O moon of the night of Hua,  
That brings fruit and food to the plants  
Here is the *kalo* plant,  
The life of the land,  
I give to the earth, Honua;  
Here is the sweet potato branch  
I plant for thee and me;  
Here is the shoot of sugar cane,  
So sweet to taste and eat,  
The emblem of desire's success;  
I place it in the earth, Mother Earth,  
O Moon of the night of Hua,  
Keep the plants green and alive  
The mermaids would sing this as they came from the central springs of Mānoa Valley to the mountain freshets, all of which would provide water to the *auwai* used to grow crops (Bouslog et al. 1994:213-214).

### 3.3.13 Waiakeakua Pūnāwāi

According to the "Legend of the Waters of the Gods," Waiakeakua is one of the many springs in Mānoa associated with the brother gods, Kāne and Kanaloa. When Kanaloa was weary of his stay with the mermaids at Wa'aloa, he journeyed into the next ravine.

As he traversed along the steep of the *menehune*, the legendary race of small people, and stood on the fern-clad slopes running down to the edge of the stream, he saw for the first time the beautiful virgin Kameha'ikana sitting on a rock next to a nearby spring, accompanied by her stubborn old nurse. Rogue that Kanaloa was, he immediately made up his mind to possess her and began to chant to her of her beauty. Although she was somewhat flattered by Kanaloa's attention, Kameha'ikana resented his boldness. Her watchful, stubborn old nurse, seeing his attitude, called out in anger. "You cannot have this water," meaning the young virgin. Whereupon Kanaloa became very angry at being repulsed and suddenly rolled a huge boulder down upon them and covered up this spring. This stone is called the sensitive stone of Waiakeakua, the waters of the gods Kāne and Kanaloa. During the season when the *'hia'ai* mountain apple, is in bloom, the stone's color changes to a brownish red. Delicate wild flowers called "Kameha'ikana's tresses" grow around this rock. Upon being closed with the boulder, the water of the spring was forced up onto the moss-grown boulders, which form the basin at the base of the ravine. Two little trickling streams issue from this rock, which is known as the breast of the beautiful goddess Hina. These two streams then fall into the basin below, which is also known as Waiakeakua, the water of the gods. (Bouslog et al. 1994:136-137)

A second version of this story has both Kāne and Kanaloa traveling to Waiakeakua Waterfall.

Ia laua e ku ana ma ia wahi, mana aku nei i ke alo pali, a ninau aku nei o Kanaloa i kona kaikuana, ina ua mana'o oia he wahi noho ia no ke kupua. Pū aku nei laua i kekahi pali laumania, a ike aku nei i kekahi wahine ui e noho mai ana me kona kahu wahine. O Kamehaikana ka inoa o keia wahine kupua. I kahi wa he kino kanaka ko laua, a i kahi wa, he kino pohaku, oia i ua loa in na kupua ka mana e hoololoi ai i ko lakou ano. Komo ihola ka ini iloko o Kane a me Kanaloa no keia ui nohe o ke uka o Manoa. I kona haka pono ana mai nohai, ua komo no ka hoolihihi no keia mau akua e ku aku nei. O ka hoomaka no ia Kamehaikana e mino aka ma ke ano hoolahi'i. Aohe i ike ke kahu o ke kanaka hea la o laua i hoolihi ai kana hanai, a i kona ike pu nohoi, i koi anei hoolahi'i maoli, ua piha oia i ka inaina. Minamina loa ia o lilo ka luhī ana, nolaila ua leleino aku nei oia mawaena o na malihini a me kana hanai, a kino ke poo ilalo a paa loa. Lela mai nei o Kane e hoopakale iaia, aka, aole mai i hiki. Ke ku nei no ke kino o ke kahu o Kamehaikana a hiki i keia la, ilalo ke poo a iluna ka wawae. Kahi a Kane i hehi ai, ke waiho ala

no kona kapuai. Ma kahi o na akua i ku ai, na kupu ae he mau kumu ohia e luhe ana na lala maluna o ka ili wai. Ua make keia mau kumu laau, a o na keiki keia e ulu nei, a e ku kiai nei "Ka wai a ke akua."

Translation:

As they stood facing the cliff, Kanaloa asked his older brother if there were *kupua* [spirits that have human and other forms] in that place. The two climbed a perpendicular cliff and found a pretty woman living there with her woman

attendant. Kamehaikana was the name of this *kupua*. Such was the nature of the two women that they could appear in the form of human beings or of stones. Both Kane and Kanaloa longed to possess this beauty of upper Manoa. The girl herself, after staring at them, was smitten with love for the two gods. Kamehaikana began to smile invitingly. The attendant saw that her charge did not know which one of the two gods she wanted and knew that if they both got hold of her she would be destroyed, and she was furious. Fearing death of her beloved one, she threw herself headlong between the strangers and her charge and blocked the way. Kane leaped to catch the girl but could not reach her. The body of Kamehaikana's attendant stands there to this day, with the head down and the feet up. The mark of Kane's footprint remains where he trod. At the place where the gods stood, mountain apple trees sprang up whose branches drooped over the surface of the water. The original trees are dead, but their seedlings are grown and guard "The water of the gods." (Green and Pūku'i 1936:114-115)

Kameha'ikana, meaning "a multitude of descendants," was one of the alternate names of Haumea, the goddess of childbirth (1959:44). Another name for Haumea is Walimu'u (Beckwith 1940:281-283), who was a *mo'o* goddess.

A third version of this story names Kawaiakeakua, or Waiakeakua, as the pool associated with this legend. Kane and Kanaloa found excellent 'awa (plant used to make a narcotic drink) in Mānoa Valley, but Kanaloa wished to know where they could find water.

Kane replied, "Here in this hill side is water." So he took his staff and struck it fiercely against the precipice by which they had found awa. Rapidly the rocks were broken off. The precipice crept back from the mighty strokes of the god and a large pool of clear, cool water nestled among the great stones which had fallen. There they mixed awa and water and drank again and again until the sleep of the drunkard came and they rested by the fountain they had made. This pool is still at the head of Manoa Valley, and to this day is called Ka-Wai-a-ke-Akua (The water provided by a god). (Westervelt 1963a:41)

The waterfall above the pond was also known as Waiakeakua.

He ua paa unau iluna o keia kuahiwai ma kona moololo ma kona moololo oia wahi e tini ni o na malihini e makaikai ai he wai hi lele mailuna mai, a hokio keia wai a nona keia inoa Kawaiakeakua he ui ke nana aku laia e kaulana nei. O kahi keia o ka poe menehune e hiamoe a i ke ao, a po hele nui e hana i na heiau a loko ia a o ke ano ae a lakou e ike ai. (Hōkū o Hawai'i, February 18, 1930)

Translation:

Visitors like to go and see a certain waterfall that drops from above into a pool. The name of this famous place is Kawai-a-ke-akua and is beautiful to see. This was where the menehunes slept in the day time and when night came they went to build heiaus, ponds or whatever they chose. (translation in Sterling and Summers 1978:288)

The pond was formerly a favorite place for picnics, drinking water, and swimming for the *alii*'s visiting and living within the valley (Mrs. Marie H. Brown, Informant, J.F. Stokes, Sites Notes, cited in Sterling and Summers 1978:288). It was known as *wai hui a Kanaloa*, and wives were supposed to drink from the life-giving waters (Bouslog et al. 1994:137). The servants of King Kamehameha filled calabashes of water from here, using a stalk of *k* or a banana leaf to funnel the water on the rock to a gourd. They then traveled down the valley swinging the gourds from the ends of sticks laid over their shoulders.

... When they came near any individual or group of Hawaiians they had to call out loudly, giving warning so that all by whom they passed could fall prostrate before the gift of the gods to the great king. (Westervelt 1963a:41)

### 3.3.14 Hills, Mountains, Peaks, Ridges and Caves

There are numerous hills, mountain peaks, and caves in Mānoa Valley which have legendary associations. On the *mauka* border in the Ko'olau Mountain range are the peaks, Pu'u Lepalepa, Awāwaloa (Mount Olympus) and Kōnāhuanui. The word *Lepalepa* means "to hang in fringes or tatters" (Pūku'i and Elbert 1986:203). Awāwaloa means "long valley or gulch" (Pūku'i and Elbert 1986:35, 209). Kōnāhuanui, the home of the gods Kane and Kanaloa, is the highest peak in the Ko'olau Mountains. The place name means "large, fat innards" and refers to a story about a giant who threw his testicles (*kona hua nuti*) at a woman who escaped from him (Pūku'i et al. 1974:117).

Konahuanui, pali of O-ahu, was named because when a man, probably a giant, chased a woman who escaped into a cave, he tore off his testes and threw them at her. (I heard Dr. Brigham give this explanation long ago.)

Though the sexual explanations may be revolting it is perhaps better to make them than to have future malihinis [foreigners] delving into the meanings, and securing wrong translations.... (Lyons 1916:936)

The peak of Kōnāhuanui is pictured by Hawaiians as the highest point of the ridgepole of a house, the house is a legendary burial cave for the high *alii*'s; that the Hawaiians believed existed under the Ko'olau Range between the districts of Kona and Ko'olauloa.

Hookahi anahuna kaulana ma Oahu. O Pohukaina ka inoa, aia ma ka pali o Kanehoalani mawaena o Kualoa a me Kaaawa, aia ka puika i manao ia ma ka pali o Kulo e huli la i Kaaawa, a o ka loa o ka puika, aia ma ka punawai o Keahuula-punawai. He anahuna alii keia, a he nui ka waiwai huna iloko a me na'lii kuhiko.

... kekahi puika, a o kauhuhu o kauaoku o keia hale anahuna, oie no ka mauna o Konahuanui a iho i Kahuku. Ua olelo ia ma ka moololo a kanaka, ua nui ka poe i kono iloko me ua ihioho kukui, inui Kona aku nei a puika i Kahuku.

A maloko a keia anahuna, he mau halokowai, he mau muliwai a mau kahawai, ua hana kinohinohi ia, a ma kauwahi aku, he mau aina palahalaha. (Kamaka, Ke Au 'Ok'o'a, Oct. 6, 1870)

Translation:

There is only one famous hiding cave, *ana luna*, on Oahu. It is Pohukaima. The opening on Kalaeoka 'o to that faces toward Ka'a'awa is believed to be in the pali of Kanehoalani, between Kualoa and Ka'a'awa, and the second opening is at the spring Ka'ahu'ula-punawai. This is a burial cave for chiefs, and much wealth was hidden away there with the chiefs of old. . . . The mountain peak of Konahuani was the highest point of the ridgepole of this burial cave "house," which sloped down to Kahuku. Many stories tell of people going into it with kukui-nut torches in Kona and coming out at Kahuku. Within this cave are pools of water, streams, creeks, and decorations by the hand of man (*hana kinohinohi'ia*), and in some places there is level land. (Kamakau 1991b:38)

On the western border of Mānoa are four peaks, Kaumuhonu, Pu'u Makani (literally, windy hill), Pu'u Laulā (literally, broad hill), and 'Ualaka'a, or Round Top. Pu'u 'Ualaka'a, which is on the boundary between Makiki and Mānoa Valleys, has many legendary associations, and alternate stories of the origin of its name, which means "rolling sweet potato hill."

On the eastern border of Mānoa, along Wa'ahila Ridge, are six peaks: Keanapoi, Pu'u Pia (literally, arrowroot hill), Pūkele (literally, muddy), Akāka, Kūmauna, and Palihuahine. Pūkele is also called Palikū, which means "vertical cliff;" Akāka, or Aka'aka (meaning "laughter"), and Kūmauna are peaks mentioned in the Legend of the Princess of Mānoa. Palihuahine, meaning "cliff of the old woman," has associations with Kamehameha I and older legends. In the central area of the western valley are a series of peaks and hills, Sylvas, Puka'oma'oma'o, Pu'u Ahula, 'Ulumalu, Pu'u Pueo, and Pu'u Mānoa (Roeky Hill or Keapapa). The legendary associations for these landmarks are described in more detail below.

### 3.3.15 Wa'ahila Ridge

Wa'ahila is the name of the ridge dividing Mānoa and Pāloalo Ahupua'a. It is also the name of a beneficent rain associated with Mānoa and Nu'uano Valleys. This association is mentioned in the saying "*Ola ke kai o Kou i ka ua Wa'a-hila*," meaning "the land of Kou [Honolulu] lives by the Wa'a-hila rain." Wa'ahila is also the name of a chiefess who excelled in a *hula* dance named for her (Pūku'i et al. 1974:218; Pūku'i and Elbert 1986:375).

The association of Wa'ahila with wind and rain is also mentioned in the Legend of Kualii'. Kualii' was a celebrated chief who possessed some knowledge of the gods and sometimes could assume the attributes of a deity. He was a great warrior, and two brothers composed an *oli* (chant) to honor the chief and recount his exploits. Within the chant (Forriander 1917a, Vol. IV:392-393) is the following description:

*I ke ala ihi, i ke alalao,*  
*I ke alalao e heleia la-la,*

*Aole i like Ku.*

*Aole i like i na laki,*

*I ka laki pala o Nuuanu.*

*I heheia e ka ua e ka makani a heleleia.*

*Ka laki pala i ka luna i Waahila-la.*

*Aole i like Ku.*

*Aole i like i ka Waahila.*

Along the sacred road, along the long road,

Along the highway traveled by him.

Not like these art thou, Ku.

Not like the ti leaf—

The yellow ti leaf of Nuuanu,

Softened by the rain and wind till it falls;

The yellow ti leaf on the heights of Waahila.

Not like to these art thou, Ku.

Not like the Waahila [wind].

### 3.3.16 Kaumana Pōhaku

Kaumana may have been an alternate name for Wa'ahila Ridge, at least the *makai* portion of the ridge. Informant Solomon Kauai related an account of a fourth famous stone known as "Kaumana," which may have been located near the present-day location of the Sacred Hearts Academy in the neighborhood of Mō'ili'i. The legend of this *p haku* is presented in detail in the Waikiki section of this report.

### 3.3.17 Akāka and Kūmauna Peaks and the Princess of Mānoa, Kāhala-o-Puna

Several places in Mānoa are mentioned in the legend of "The Princess of Mānoa," including the peaks Akāka and Kūmauna at the back of the valley. This story tells of the beautiful woman Kahaloopuna, also called Kaikawahine Ānuenuē, meaning "the Rainbow Maiden" (Westervelt 1963b:84). This story has several versions with different place names emphasized and different endings.

The Princess of Mānoa was the daughter of Kahaukani (the *hau* tree wind of Mānoa) and Kauakuahine (the sister rain of Mānoa), who were the twin offspring of the mountain peaks 'Aka'aka (the peak now called Akāka), meaning "laughter," and Nālehua aka aka, meaning "the *lehua* bushes of 'Aka'aka," the neighboring promontory (Kalākaua 1990:511). In commemoration of this union, "the growth of *lehua* (*lehua* ' *hi'a*) bushes crowning the spur of 'Aka'aka, is said to still attest" (Thrum 1892:11). The twins were kept apart in their youth and raised by foster parents; the chief Kolowahi took the boy and his wife Pōhakuakālā took the girl. When the wind and rain twins of Mānoa were later married, it brought to Mānoa Valley "an inheritance of rainbows and showers for which it has since been distinguished" (Kalākaua 1990:512).

The union of the twin sister and brother resulted in a concentration of *mana* (power) in Kahaloopuna, so that she always gave off a rosy light.

Her cheeks were so red and her face so bright that a glow emanated from them and shone through the thatch of her house when she was inside; a rosy light seemed to envelop the house, and bright rays constantly played over the house.

When she went to bathe in the spring below her house, the rays of light surrounded her like a halo. The natives maintain that his bright light is still occasionally seen at Kahaiaimano indicating that the spirit of Kahaloopuna is revisiting her old home. (Thrum 1998:119)

She lived in a grove of *'iiahi* (sandalwood) trees at Kahaiaimano on the road to Waiakeakua, a pool within the tributary stream to Mānoa Stream. She often bathed at the sacred spring called Lua'alea. Kahaloopuna was betrothed in infancy to Kauhū, a young chief from Kailua (or Waikīki in some versions). She was famed for her beauty, and one day, two lesser chiefs, named Kūmauna and Keawaawaki'ihelei, claimed that they had been intimate with her. Her fiancé, hearing this rumor and believing that she had been untrue to him, went to Kahaiaimano and led her away from her house to Hualea, where he killed her and buried her. An owl god, her personal guardian spirit, or *'aumakua*, dug her up and resuscitated her. Kahaloopuna sang a lament of her cruel fiancé, Kauhū, who heard the lament and returned to Hualea and told Kahaloopuna to follow him again.



Kauhi killed her twice more, each time telling him to follow him, then killing and burying her; each time the owl again resuscitated her and brought her back to the living. On the third time, Kauhi buried his fiancé under the roots of a tree and the owl could not free the girl; instead, two spirits revived the girl. A young man, in some versions called Mahana, found her and took her back to his home in Kamō'i'i'i (old name for Mō'i'i'i, a land area in Mānoa). Kauhi was eventually punished for his cruelty and Kahaloopuna married her young rescuer (Thrum 1998:188-132). The lands and fishponds of Kauhi were given to Mahana, who ruled as a chief of these lands, with the beautiful Kahaloopuna as his wife for many years (Skinner 1971:220-222).

A second version of this tale has a darker ending. Kahāiāmano, the home of Kahaloopuna, means "the shark sacrifice," which is related to one alternate ending of the story. In this version, Kahaloopuna was killed five times by her fiancé, and revived four times by the owl. On the fifth murder, Kauhi buried her underneath a *koa* tree, so that the owl could not dig her up. Kahaloopuna's spirit called to several passerbys, including a young man who carried her to his home in Mō'i'i'i. The man's older brother and two spirit sisters carried Kahaloopuna to Mau'oki, an underground pool at Kamō'i'i'i to revive her. These healing waters were then called "the waters of Kahaloopuna."

The young man next provoked Kauhi into a dispute, claiming that Kahaloopuna was alive, which Kauhi denied. Kahaloopuna appeared and her grandfather 'Aka'aka testified that this was indeed his granddaughter, proving Kauhi to be a liar. Kauhi was put on trial with the *mo'o* of O'ahu as judges. As punishment, Kauhi, his followers, and the two men who falsely accused Kahaloopuna were baked in an *imu* (oven) at Ulukou ("grove of *koa* trees"). Waikīkī, near the side of the stream 'Apuakēhau, a place close to where Mānoa Stream used to empty into the sea.

Some time following the night of the death of Kauhi, a tidal wave sent by a shark god swept over the land, carrying out the bones from the *imu* on the beach. The spirits of Kūmauna and Keawaakihēle were transformed into two peaks at the back of the eastern side of Mānoa Valley (Thrum 1998:131). Kauhi, whose *zumaakua* was the shark god, was turned into a shark. 'Aka'aka learned of the transformation and urged his granddaughter to never go into the sea. The daughter obeyed her grandfather for two years, but one day when the surf was fine and there were many people in the ocean, Kahaloopuna decided the water was safe and took a surf board into the ocean. Kauhi now had his chance for revenge and bit her body in half, eventually dragging it to Wai'anae where it was completely devoured in a school of sharks.

In sorrow Kahaloopuna's parents and grandparents deserted their human forms. The father became the Mānoa Wind; his physical form was a grove of *hau* trees below Kahāiāmano. The mother became Mānoa Rain and her rain form could also sometimes be seen near Kahāiāmano. Kahaloopuna's grandfather 'Aka'aka became a mountain spur, and his wife, Nalehua'aka'aka, became a thicket of *lehua* bushes on the spur (Kalākaua 1990:511-522).

Formander's version of the story tells of Kahala-o-Puna (the sweet-scented *halala* flower of Puna), called the princess of Mānoa (*ka 'iu-o-l-M noa*). She was the beautiful daughter of Ka-uakuaehine (The rain of the mountain ridge) and Ka-hau-kani (the Mānoa wind), who were the twin sister and brother born to 'Aka'aka and Na-lehua-aka'aka, which are the names of a projecting spur of the ridge and the red *lehua* bushes that grow upon it. Kahaloopuna was so beautiful that rainbows always played about her home, called Kahaimano, which was on the trail to the spring Kawaiakēkua. Mānoa girls later born in this area were also known for their beauty (Beckwith

1940:152-153), so much so that it was also called *ka ui o Manoa*, the "valley of beauties" (Nakuna 1904:42).

Kahaloopuna was affianced to Kauhi, a man from a powerful family of Ko'olau or Waikīkī. Two mischievous men said they had enjoyed her favor, which drove her fiancé into a jealous rage. Kauhi went to Kahaloopuna's house and asked her to follow him. He led her to the uplands of Pōhākea (area between 'Ewa and Wai'anae), where he struck her. Kahaloopuna chanted the following lines (Formander 1918, Vol. V:190-191):

*Kuu kane mai ka uka o Kahoiwai,*

My husband from the uplands of Kahoiwai,

*Mai ka uka laau hihī i ka nahahe*

From the uplands where the creeping trees grow,

*Kuu kane o Kahaiāmano e! Auwe!*

My husband from Kahaiāmano, alas!

*Me he manio la no ka lili ia'u,*

Like unto a shark is your jealousy of me,

*Ka hoi koke mai no nanahu ia'u*

Quickly returning to bite at me,

*O hau nui aloha, ua hāi iho nei e! Auwe!*

My great love for you is, however, broken, alas!

Kauhi then beat her to death, and her spirit flew to the top of the tree and chanted her story, where passerbys heard her and informed her parents. The parents dug up the body, found it still warm, and revived her to life (Beckwith 1940:152-153).

After Kahaloopuna's final death, her mother melted into the rain called Luahine-o-Mānoa. Her father became two things, a *hau* tree, and the wind in the valley. This *hau* tree supposedly could still be found up to the time of Queen Emma, and would groan and sigh whenever an *ali'i* died. According to Mary Kawena Pūke'i, March 16, 1954, cited in Sterling and Summers 1978:289), the property was later acquired and the tree was destroyed.

Kaho'iwai was the name of the home of Kahaloopuna and the name of the area where she still is supposed to be "mourning and wailing her death in consequence of her husband's rash anger" (Dictionary of Hawaiian Localities, *Saturday Press*, Dec. 1, 1883). A stream and adjoining land at the head of Mānoa Valley near Kaho'iwai, is known as Kahāiāmano (Dictionary of Hawaiian Localities, *Saturday Press*, Dec. 1, 1883), and is mentioned in the legend of Kahaloopuna.

In a third version of the "Legend of the Princess of Mānoa," the two men who accused Kahaloopuna of infidelity, were Kūmauna, who had a humped back and Keawaakī'ihele, who had a disfigurement called *maka-hēle*, in which the eyelid is turned in such a way as to display the inner red membrane. These men were mountaineers, dwelling with a few retainers in the eastern corner of Mānoa Valley, in a place called the Canyon of the Makaweli. In this version of the tale, Kauhi leads Kahaloopuna first up the slopes of 'Aihualamaiki adjoining Kahaumakaawe. This slope was formerly covered by *koa* and *lama* (*Diospyros* spp.) trees. Near a large rock half way up the slope, Kauhi kills his fiancé with a blow to the head with a bunch of *halala* nuts.

It was the belief of the mountaineers of the olden time that the spirit of the murderer Kauhi haunted the trail between Manoa and Nuuanu, and that often male and fern gatherers were startled by a faint and mournfully sweet song changed by the spirit of Kahaloopuna, and the answering despairing wail of Kauhi, "O, my wife, come back to me! I was wrong." "*E ka'u u wahine-e, hoi mai-i. Ua hewa wa-u.*"

In the eastern corner of Manoa Valley can be seen the peak of Kūmauna, with a hump on the back of the ridge leading up the peak, and alongside of it the ravine

of Keawawa-Ki'ihelēi. These places belong to and are called after the two wicked men who were the cause of the sad death of Kahaloopuna.

And when the gods realized that their favored maiden had been murdered, they decreed that the rains would fall daily about the valley of beauty, their tears in memory of her graces. (Nakuina 1904:45)

An alternate version of this story transforms many of the main characters into gods. According to this version, at the head of Mānoa valley lived Hine, the spirit of the rain-clouds, and Kani, her husband, who was the god of the winds. They had one child Kaha, who was so beautiful that the god of the sea asked for her to be the wife of his son, Kauhī, the prince of the sea. Kaha cared nothing for Kauhī, but “loved best of a swift flight in the cloud-chariot of Hine, when, driven by the winds of Kani, it skimmed over the shining green earth and far out above the blue ocean. It was such fun to spy out the little grass huts of the earth-folk, and pour down swift gusts of rain, just to see the people scurry to shelter.” (Day 1906:2). One day Kaha spied some Hawaiian youngsters dragging up their *h lua* (traditional sliding) sleds to the top of a hill. The rain from Hine's cloud poured down and made the sleds too wet to use. One of the youngsters, a chief called Mahana, looked straight up into the clouds and shook his fist. When Kaha looked into the man's eyes, she thought he was much finer than her own fiancé, Kauhī.

Hine saw the look in Kaha's eyes and took her for a while to the other side of the mountain valley. Mānoa became parched and all of the waterfalls dried up. Kaha grew sad on the damp windward side of the mountain, missing the sunshine of her own home. One day while she was sitting on a high rock looking into Mānoa, a dense cloud surrounded her and lifted her out of the mountains. When she reached the earth, her form was that of a beautiful mortal girl. Kaha found Mahana and the other people and spent a wonderful day sledding down the hill over and over. At the end, Mahana asked her to be his wife. Kaha, who now realized that she was mortal and could not return to her own air-people, accepted and lived with Mahana and his people. One day, Kaha swam far past the reef to gather seaweed. A shark could be seen from the shore, but Kaha was gone. The shark was a form of Kauhī, who had seen Kaha and meant to return her to her own air-people, but since Kaha had become mortal, the bite of the shark was fatal, and he returned her body sorrowfully to the shore. The people laid her in a grave in the central part of the valley where the weeping of Hine and the wailing of Kani can still be heard. The children of Mānoa sometimes say “Oh, there comes Hine with her tiresome tears!” (Day 1906:1-11).

### 3.3.18 Pali Luahine and Kamehameha's Cave

On the eastern corner of Mānoa Valley there is a series of foothills called Kapaliuahine. The area was known for its very sweet ‘*hi'a*’ (Dictionary of Hawaiian Localities, *Saturday Press*, Dec. 15, 1883). The name, meaning “cliff of the old woman” refers to the legend of a *mo'o* who once lived on the *pali* (cliff) back of the Maunaloa fishpond. This woman annoyed the people of Maunaloa and was driven out by Pele. She traveled to Mānoa and behaved herself there, calling her new home Pali Luahine.

Luahine had two sons, Kumauna and Palihala. There are three stones. The lower one is Luahine, and the two higher up are her sons. Mrs. Pukui thinks that Pali Luahine is back of the “little green hill.” (M. Pūkui 5/28/53, cited in Sterling and Summers 1978:290)

Westervelt (1904:2) claimed that Kamehameha, who landed at Waikīkī when he invaded O'ahu in 1795, lived with his warriors for a time in a great cave on the east side of Mānoa Valley: “The path to the entrance is marked by a few straggling coconut trees. The Hawaiians say this cave formerly extended through to the mountain spurs from Mānoa to Pālolo Valley.”

This cave, located in the area called Kapaliuahine, has been surveyed and the back is solid stone, and could not have led to Pālolo Valley. The location of this cave is on Wa'ahila Ridge in the area now covered by Woodlawn Drive near the astronomy building of the University of Hawai'i.

According to a long-term resident of Mānoa Valley, Mary Jane Montano, the name Kapaliuahine came from this historic association with Kamehameha I. This story relates that the warriors were homesick, and Kamehameha sent a message to an old chiefess named Waluwalu on the island of Hawai'i. The wives of the warrior were brought to O'ahu on a fleet of war canoes, and the place that the women camped was called “the hillside of the old woman,” or Kapaliuahine (Bouslog et al. 1994:14, 187).

### 3.3.19 Puka'ōma'o, or Puka'ōma'o ma'o

Puka'ōma'o means “green apertures or openings” (Pūkui et al. 1974:190), and probably referred to the green shutters on the Queen Ka'ahumanu's house in Mānoa Valley (Sterling and Summers 1978:287). The longer name Puka'ōma'o ma'o can mean “green gateway,” and may refer to this point as the access point to the head of the valley. Ka'ahumanu's estate was large and extended across the upper valley, including Pu'ulea, which in 1845 became the old Chinese burial ground. On her estate, there was a “kind of village of forty or fifty huts, the houses of the chiefs, a schoolhouse and a chapel” (Diary of Elisha Loomis, cited in Bouslog et al. 1994:153). In 1829, the location was described as in the back of the valley in East Mānoa by Charles Stewart, a chaplain on the American naval vessel, the *Vincennes*.

The valley of Manoa, you recollect, was always a favorite resort of mine—this afternoon Mr. Bingham drove me in a wagon to it. There is now a good carriage road, in that direction, as far as the country house of Kaahumanu, nearly five miles from Honolulu. Her residence is beautifully situated, and the selection of the spot quite in taste. The house is an inferior building, but stands on the height of a gently swelling knoll, commanding, in front, an open and extensive view of all the rich plantations of the valley; of the mountain streams meandering through them, and the humble habitation of the farmer sprinkled around; of the district of Waaiti; and of Diamond Hill, and a considerable part of the plain, with the ocean far beyond. On the right, the ground rises rapidly for a few rods, to a thicket of hibiscus and Eugenia, at the foot of a magnificent mountain, exhibiting from the base to its summit a perpendicular height of a thousand feet—as rich a variety of projecting cliff and wild recess, of dripping rocks and mantling foliage, of graceful creeper, pendant shrub, and splendid flower, as Arcadia itself can boast. On the left, there is a gradual descent, from the house, of two or three hundred feet to the depth of the valley. Here this is a half a mile wide, and bounded at that distance, by a spur of mountain, which, commencing at the entrance of the valley on the plain two or three miles in front, rises first in uncovered swellings, but rapidly assumes, as it runs inland, a boulder formation, till in several places it

presents a succession of broad based and regularly defined pyramids, beautifully verdant and tufted with wood; giving a most peculiar character to that section of the scenery.

Immediately behind the house, and partially flanking it on either side, is a delightful grove of the dark leaved and crimson blossomed Ohia, so thick and so shady as insensibly to remind one of Cowper's Wilderness at Olney--filled with cool and retired walks and natural retreats, and echoing in the cheerful notes of the little songsters, who find security in its shades to build their nests and lay their young. The view of the valley inland, from the clumps and single trees edging this copse, is very rich and beautiful; presenting a circuit of two or three miles delightfully variegated by hill and dale, wood and lawn, and enclosed in a sweep of splendid mountains, one of which in the centre rises to a height of three thousand feet. (Stewart 1831:140-141)

Ka'ahumanu retired to her estate in Mānoa to get away from the heat, dust, and political enemies that she made in Honolulu. In 1826, Ka'ahumanu ruled against a libel charge made by a British whaling man, Captain Buckle, in favor of the Lahaia missionary, Mr. Richards. Mr. Richards had spread the news that the captain had purchased a Hawaiian woman for money, breaking the law against prostitution. This ruling by Ka'ahumanu caused great anger among the critics of the missionaries, including the British Consul to Hawaii'.

Ua lilo o Kaahumanu i enemi no ke Kanikela a me na haole kalepa a pau e noho ana ma Honolulu, a ua kokua ia mai e Boti a me Manuia, pakele loa aela o Kapena Bakala a me Kapena Kalaka. . . .

O ke kumu nāe o ka pepahi ia ana, ua ai ka bipi a ua Kanikela nei i na mea kanu a Kaahumanu o uka o Mānoa, a hōpūhōpū ia ka bipi a puka loa i Pāwaa. Ua hōohēi ia ke kanaka nana i aluahu i ka bipi e ke Kanikela Beritania. O Kanekuaehine ka inoa, he kanaka kīai no Kapukaomaomao i uka o Mānoa. (Kamakau, Ka Nūpepa Kū'oko'a, June 6, 1868)

Translation:

The queen by this decision made enemies for herself of the consul and the foreign merchants and of Boki and Manuia of her own people. . . . The consul beat up one of her [Ka'ahumanu's] keepers who had chased away the consul's cattle which roamed at large all the way to Pāwā'a and were eating Ka'ahu-manu's plantings at Kapuka'oma'oma'o in Mānoa. (Kamakau 1992:280-283)

Ka'ahumanu died in this house. She was moved to Mānoa in 1832 from her house in Honolulu ". . . in hope that the salubrious air would prove beneficial, but which terminated fatally June 5<sup>th</sup> of that year" (Thrum 1892:113). John Papa 'Ūi (1959:158) stated "Kaahumanu died on June 5, 1832, at her house with the green shutters in Mānoa valley, close to Kawaiho'olana. Because of her love for Mānoa she went there during her last illness after having been sickly for four or five years." The place name Kawaiho'olana could not be found on the 1883 Bishop map, but a long-term resident of the valley, Maka Woolsey, placed this area *mauka*

of the 'i'i of Kukuio, shown on the 1882 Baldwin map (see Figure 8) as just *maka'i* of the 'i'i of Komoawa'a. Samuel Kamakau reported:

A hiki i ka poeleele ana iho, o ka loa no ia i ka mai, a i ke ao ana ae, o ka hoihoi ia no ia i uka o Mānoa, ma kahi i ku ai o kona hale hooluolu ma ka Pukaomaomao, ma ka lihi malu o ka ulu ohia apāne me ka ulu kukui. Hookahi wale no ple me ka hapa ke kaa ana i ka mai, a i ka wanao o ka Poalua, la 5 o lūne 1832, make ihola o Elisabeta Kaahumanu, i ke 64 o kona mau makahiki. Aohe i lu ia iho kona kino a me kona hanohano ui a maikai.

I ka wa kakahiaka nui, ua hoihoi ia mai i ke kulamakauhale, i auamo ia mai ma loko o ka manele hale lōle, a no ka lūlūlū, ua komo pu laua me ke kaikamahine Kamanele i loko o ka hale lōle [Kamakau, Ka Nūpepa Kū'oko'a, Aug. 29, 1868].

Translation:

Late that night she became ill and at daylight was removed to her rest house up Mānoa Valley at Puka-'oma'oma'o on the edge of the 'ohi'a and kukui groves. A week and a half later in the early hours of Tuesday, June 5, 1832, Elizabeth Ka'ahu-manu died in her sixty-fourth year, while her body showed no look of age and her bearing was still impressive. Early in the morning she was brought into the city on a covered litter and it shook so much that her niece, Ka-manele, occupied it with her. (Kamakau 1992:308)

Thrum (1892:113) places her residence in the 'i'i of Komoawa'a:

The locality where the good queen passed away shows little evidence now of ancient royal residence. It was situated well in the valley at a place known as Komoawa'a; the residence itself being called Pukaomaomao, from its green painted doors and blinds. Puulema, the old Chinese burial ground, from the year 1845, situate at the head of the central road of the valley, is said to have been part of Kaahumanu's estate. (Thrum 1892:113)

An 1872 reminiscence in the Hawaiian newspaper, *Ka N pepa K 'oko'a*, implies that Ka'ahumanu's residence is at or near Kaho'iwai.

He aina maikai no o Mānoa, oia ka helu elua o ke awawa a ka olu i noho ai, ua hoopulu mau ia oia e ka noe a me ka ohu, a he uliuli lipolipo hoi i na laau, mai kona piko honua a i kona mau kuemaka pali; a nōna hoi ka ua kaulana, he Kauhine a ka mahani kalakulet kauhale, he Kakea. A ma keia wahi no i luana mau iho ai ka Makuahine A'ii Kaahumanu, e walea ana i ka olu o ka wai o Kaho'iwai, a me ka huihui momoma o ka wai pepee, palapalai o Waiakēkua, a no ka honi mau paha i na e oluolu o ka uka; a na kona a i alii no hoi a lei mau na lehua puakea o Naniuapo, a kuu aku la kona lūhi. (Kauliinoe, Ka Nūpepa Kū'oko'a, Nov. 16, 1872)

Translation:

Mānoa is a fine land and one of the two valleys where coolness dwells. It is constantly kept moist by fog and mist and it is green with trees from the base to



According to legends concerning the gods Kāne and Kanaloa journey through Mānoa Valley, Laura Green and Mary Kawena Pūku'i state that:

Hoomau no laua i ka laua huakai hele, a i Manoa, i Puaahuula (I Puaahuula i noho ai o Kaahumanu, ka wahine a Kamehameha nanaupuni).

The two continued their journey up Manoa to Puaahuula (the place where Kaahumanu lived, wife of Kamehameha the conqueror of the islands). (Green and Pūku'i 1936:114-115)

Mary Kawena Pūku'i describes the home of the queen within a grove of guava trees near a pool and spring.

Queen Kaahumanu lived in Manoa. Her home was called Pukaoma. The first guavas and the first goldfish were brought there by the queen. Mrs. Malia Kakoi Kamana remembers her mother telling her that a tapu was placed on the guava; no one could have any unless the queen gave them to her. But the birds pecked the fruit, and soon the guava spread all over the island. (Mrs. Mary Kawena, Hawaiian Ethnological Notes, Vol. 1, p. 1378)

Pu-ahu'ula (Pu here is short for Puna) 'Spring-of-the-Feather-Cape.' There was a mo'o who lived there. Somewhere mauka of Pukaoma'o. (M. Pūku'i, 3/26/54, cited in Sterling and Summer 1978:288)

A book on Ka'ahumanu's death mentions such a feather cape associated with this location:

... Realizing that the end was near, Ka-ahumanu asked to be taken to Pukaomaoma, her mountain home far up in Manoa Valley . . .

The couch upon which Kaahumanu was to rest had been prepared with loving care. Spread first with sweet-scented male and ginger leaves, it was then covered with a golden velvet coverlet. At the head and foot stood towering feather kahilis. Over a chair nearby was draped the Kamehameha feather cloak which had been worn by Kaahumanu since the monarch's death. (Mellen 1952:270, 272)

Mary Kawena Pūku'i believed that Ka'ahumanu's house was near the end of Huelani Drive in the 'i'i of Pū'ahu'ula, where there was once a spring called Huelani. She believed that the name, *huelani*, the royal gourd, referred to the well that was once near Ka'ahumanu's home. This would place the house in the 'i'i of Pū'ahu'ula, *mauka* of the hill Pu'u Ahula. Princess Victoria Kāmāmalu, the granddaughter of Kamehameha I, was said to have had a home on a hill in Pū'ahu'ula, *makāi* of Ka'ahumanu's house (Bouslog et al. 1994:198). This seems to confirm that Ka'ahumanu's house was *mauka* of the hill Pu'u Ahula.

A 1940 article by Ethel Damon also placed the house in Pū'ahu'ula, at the end of Olopuā Street.

On the north slope of the valley, leading the way for present-day roads and houses, Kaahumanu built a home where she often retired for quietness, she said, and freely moving air. Here she planted choice *lehua* trees and the tiny red Hawaiian hibiscus which still grow there not so long ago. Her Green Gateway she called this home, Pukaomaoma, through which she looked out over the valley

below. Until very recently one could clamber up to the foundations stones of Pukaomaoma, in a little Japanese flower garden above Olopuā Street, a short mile mauka of the Waioli Tea room, and today a thicket of hau trees still twists itself protectingly about some of those stones. (Damon 1940:5-6)

Most of the recent research on this question has placed the house in the 'i'i of Puka'ōma'ōma'ō. As noted previously, the 1952 newspaper article said that the house was at the junction of Mānoa road and O'ahu Avenue. Mānoa Road and O'ahu Avenue actually merge at a second point farther up the valley. This location is within the 'i'i of Puka'ōma'ōma'ō, just *makāi* of the 'i'i of Kaho'i'wai. This location is also just west of the border of the 'i'i of Komoa'wa, where Thrum (1892:113) placed the house.

Bouslog (1983:13) believes that the question has finally been answered. On the 1882 map of Mānoa Ahupua'a (see Figure 11), there is a triangulation station marked "Pukaomaoma." This map was drawn by Erdman D. Baldwin, the grandson of the missionary Dwight D. Baldwin who had personally visited the queen's house. Thus E. D. Baldwin would have known exactly where the queen's house was located. This mapped point is about at the modern junction of Kumuone and Loulu Streets in the 'i'i of Puka'ōma'ōma'ō. Of all the suggested locations, this last is the most *mauka*, which would agree with the descriptions of Ka'ahumanu's house as at the "head" of the valley.

### 3.3.20 • Ulumalu Hill and Kūkāō'ō Heiau

According to legends, the *menehune* built a fort and a temple at the top of the hill 'Ulumalu. They were driven away from their fort by the high chief Kuāli'i during his reign (sometime in the 1700s). Kuāli'i rebuilt it after his seizure of the fort.

Another legend says that the *menehune* were driven from their fort and temple by the owls, who became their bitter enemies.

The legends say that the fairy people, the Menehunes, built a temple and a fort a little farther up the valley above Pu'u-pueo, at a place called Kūkāo, where even now a spreading hau tree shelters under its branches the remaining walls and scattered stones of the Kūkāo Temple. It is a very ancient and very noted temple site. Some people say that the owl-god and the fairies became enemies and waged bitter war against each other. At last the owl-god beat the drum of the owl clan and called the owl-gods from Kauai to give him aid. (Westervelt 1963a:132)

With the aid of the Kauai'i owls, there was a great battle and the "fort and temple" were captured; the *menehune* were driven out of the valley. The *heiau* and the hill were also associated with a legendary cave. In "The Legend of Punahou Spring" (Thrum 1892:113), the twin sister and brother Kauawaahia and Kaukuahine hide themselves in this cave when they run away from their cruel stepmother.

In the late nineteenth century, the Castles (descendants of an early missionary family) built a large estate on this hill, called Pu'uhooua. The house was later torn down and many small houses were built in this area during the 1910s. Several owners of these houses have heard the "ghostly footsteps of children" running up and down their stairs in these houses over the years. Glen Grant (1996:113) has speculated that these sounds may be related to the child-size *menehune*, running over the area on which their fort once stood.

According to legends concerning the gods Kāne and Kanaloa journey through Mānoa Valley, Laura Green and Mary Kawena Pūku'i state that:

Hoomau no laua i ka laua huakai hele, a i Manoa, i Puaahuula (I Puaahuula i noho ai o Kaahumanu, ka wahine a Kamehameha nanaupuni).

The two continued their journey up Manoa to Puaahuula (the place where Kaahumanu lived, wife of Kamehameha the conqueror of the islands). (Green and Pūku'i 1936:114-115)

Mary Kawena Pūku'i describes the home of the queen within a grove of guava trees near a pool and spring.

Queen Kaahumanu lived in Manoa. Her home was called Pukaoma. The first guavas and the first goldfish were brought there by the queen. Mrs. Malia Kakoi Kamana remembers her mother telling her that a tapu was placed on the guava; no one could have any unless the queen gave them to her. But the birds pecked the fruit, and soon the guava spread all over the island. (Mrs. Mary Kawena, Hawaiian Ethnological Notes, Vol. 1, p. 1378)

Pu-ahu'ula (Pu here is short for Puna) 'Spring-of-the-Feather-Cape.' There was a mo'o who lived there. Somewhere mauka of Pukaoma'o. (M. Pūku'i, 3/26/54, cited in Sterling and Summer 1978:288)

A book on Ka'ahumanu's death mentions such a feather cape associated with this location:

... Realizing that the end was near, Ka-ahumanu asked to be taken to Pukaomaoma, her mountain home far up in Manoa Valley . . .

The couch upon which Kaahumanu was to rest had been prepared with loving care. Spread first with sweet-scented male and ginger leaves, it was then covered with a golden velvet coverlet. At the head and foot stood towering feather kahilis. Over a chair nearby was draped the Kamehameha feather cloak which had been worn by Kaahumanu since the monarch's death. (Mellen 1952:270, 272)

Mary Kawena Pūku'i believed that Ka'ahumanu's house was near the end of Huelani Drive in the 'i'i of Pū'ahu'ula, where there was once a spring called Huelani. She believed that the name, *huelani*, the royal gourd, referred to the well that was once near Ka'ahumanu's home. This would place the house in the 'i'i of Pū'ahu'ula, *mauka* of the hill Pu'u Ahula. Princess Victoria Kāmāmalu, the granddaughter of Kamehameha I, was said to have had a home on a hill in Pū'ahu'ula, *makāi* of Ka'ahumanu's house (Bouslog et al. 1994:198). This seems to confirm that Ka'ahumanu's house was *mauka* of the hill Pu'u Ahula.

A 1940 article by Ethel Damon also placed the house in Pū'ahu'ula, at the end of Olopuā Street.

On the north slope of the valley, leading the way for present-day roads and houses, Kaahumanu built a home where she often retired for quietness, she said, and freely moving air. Here she planted choice *lehua* trees and the tiny red Hawaiian hibiscus which still grow there not so long ago. Her Green Gateway she called this home, Pukaomaoma, through which she looked out over the valley



### 3.3.21 Pu'u Pueo

In several versions of the story of Kahala-o-Puna (Sterling and Summers 1978:285), the owl that revives the Princess of Mānoa lives on Pu'u Pueo, or "Owl Hill" (Pūku'i et al. 1974:205). Kauihi, the fiancé, first leads Kahala to the foot of the valley near a spot called "Aihualama (the name of one of Mānoa's tributary streams). The owl god finds her, revives her, and carries her back to the head of the valley. In the second attempt by the fiancé to kill Kahala, he leads her along a ridge of the valley and kills her with a bunch of *hala* nuts. The owl again finds her and revives her. At the third attempt, the fiancé leads Kahala across the ridges of Mānoa to Nu'uano, and kills her there. The longest waterfall in the back of Mānoa Valley is supposed to be the tears of Kahala for the suffering caused by her jealous fiancé (Westervelt 1963a:129-130).

The owl of Pu'u Pueo was sometimes known as Pueo Ali'i, the king of the owls. He was associated with other ghost spirits who he led as an army along the hillside below Pu'uhoiua Temple (the Castle home). Kāhuna would consult with him by signs or oracles (Westervelt 1963a:130-131). The owl king ruled over the valley and acted as an avenging spirit. One time, the owl "sought to execute judgment upon a culprit for some alleged transgression, but upon the pledging of the accused for a hearing before executing judgment, it became thereafter the established custom that no one should be condemned till tried and proven guilty" (Thrum 1892:111).

Pu'u Pueo (or the nearby 'Ulumalu hill) may have been the site of the *heiau* mentioned in the "The Story of Kapo'i," which was introduced in the Makiki Valley section of this report. Kapo'i, who lived in Makiki, had gathered some owl eggs for his supper. Pueo, the owl followed him to his home and begged for the return of the eggs. In kindness, Kapo'i returned the eggs, and in return the owl agreed to be Kapo'i's personal 'aumakua, or guardian god.

Ka lilo ana o ka pueo i akua no Kapo'i.

Kauooha mai la ka pueo ia Kapo'i e hana i Heiau; a e kukulu i kuahua i lele, a o ka inoa o kahii e kukulu ai o Mamo. Kukulu iho la o Kapo'i ka Heiau a pua. A kau iho la i ka mohai a me ka maia iluna o ka lele, a kapu iho la, a noa ae la. (Kamakau, Ka Nūpepa Ku'oko'a, July 22, 1865)

Translation:

The owl then became a god for Kapo'i. He commanded Kapo'i to build a *heiau* and a *kuahu* and a *lele* [altar where sacrifices are placed] altar within it. The *heiau* was to be built in Mamo. Kapo'i built the *heiau* and placed his sacrifices and bananas on the *lele* altar; he imposed the *kapu* and freed it. (Kamakau 1991b:23)

This angered the king of O'ahu who was building his own *heiau*, and had announced that no one else could set a *tabu* on a *heiau* and lift that *tabu* before him. Since Kapo'i committed this very act, the king decided he must be killed and sacrificed at the chief's own *heiau*, at Kūpalaha in Waikīkī. The owl 'aumakua made an appeal to the king of the owls, who lived in Mānoa Valley. The owl king summoned all the owls of the islands, who attacked the king's men and set Kapo'i free. The place of this great battle in Waikīkī was known as Kūkae-unahi-o-pueo, meaning "the-confused-noise-of-owls-rising-in masses" (Westervelt 1963a:127-137). Another version says that the owls scratched at the eyes and noses of the men and covered them in excrement, so the place of battle was called Kūkae-unahi-o-pueo, meaning "the scaly excrement

of owls." The 'aumakua of Kapo'i was from then on worshiped as the god Kū-kaua-kahi. (Kamakau 1991a:23).

### 3.3.22 Pu'u o Mānoa (Rocky Hill)

According to the eminecenes of boys who attended Punahou School, there were many caves in Pu'u o Mānoa, which they called Rocky Hill. Some boys once found a wooden idol "in a cave on Rocky Hill, a vestige of the *heiau* that once stood in that area" (Foster 1991:128). The *heiau* they refer to must be Kūkaō'o Heiau, which was actually on 'Ulumalu Hill, *mauka* of Rocky Hill. It is possible that since both hills are on the same ridge, that the boys considered 'Ulumalu part of Rocky Hill. The boys at the school gave this hill its current name, as they did many of the peaks and hills of Mānoa Valley, including Tantalus and Mount Olympos.

There is a small hill back of Punahou, which is very rocky. And for that reason the Punahou boys gave it the name of Rocky hill. . . . The sides are covered with cliffs about 40 or fifty feet high. Some times on Saturday the boys go up to Rocky hill and roll down the great rocks over the cliffs. Which come down with a great crash.

There are also some magnificent caves there. Which we boys have found. There are some Wilde cates [sic] which have dwelling in the caves. The boys Once had the success of killing one which we brot down to Punahou and bearrid it with great seremony. (Boy's composition 1848, cited in Alexander and Dodge 1941:136)

As previously noted in the above section on legends concerning springs, Rocky Hill had several alternate names. In the Legend of the Waters of Kāne at Punahou, Rocky Hill is called Keapapa. In the Legend of Kauawa 'ahila (Wa'ahila Rain) and his sister Kauakioiwa (Mountain Mist), the twin children of the chief Kaha'akea hide in a cave in Rocky Hill to escape from their stepmother, Hawea. When Kaha'akea learns of his wife's cruelty to their children, he kills Hawea and then himself. The hill in which the children hid was named after the father, Kaha'akea.

### 3.4 Interview with Maka Woolsey about West Mānoa Valley

Maka Woolsey, a Chinese-Hawaiian businesswoman, was the granddaughter of Nāholowāʻa, who had moved to Oʻahu from Maui during the reign of Kamehameha II and received a three-acre *kūleana* in Mānoa Valley called Keaulana. With her second husband, George Woolsey, she became involved in the growing of taro and the sale of *poi* (pounded taro), becoming the proprietor of the Mānoa Woolsey Poi Factory. During the writing of the book “Manoa, the Story of a Valley” (Bouslog et al. 1994:99-104), she was interviewed about legendary places in the valley. The interview is written as if one is walking up the western valley on the old trail, now covered by Mānoa Road.

Maka Woolsey began her story at Punahou College. She pointed out the location of Pōhakuōla, a *p haku kapu*, or sacred stone in the long rock wall of Punahou School, marking the boundary of Kapunahou. The stone was placed there during the reign of the chief Pāki. Another sacred stone, Keapoapo, was also on the Punahou campus. According to Maka Woolsey (Bouslog et al. 1994:111), the two stones call to each other: “You come here,” says one, “No, you come here,” answers the other.

Heading into the valley, one next stopped at Kapukahau at the present junction of Hastings and Punahou Streets. A hut owned by Keʻiliani offered shade and rest to travelers. Further on was Keaeae, the “red in the rock.” This *p haku* was named for a legend concerning a young man named Keaeae, who was slain by his own family to save him from any possible misfortunes in his future life. When he was slain, this rock on the Mānoa path turned deepest red (Bouslog et al. 1994:111).

At the summit of the hill were once two high and two low stones, called *p haku kau kanaka*, which were placed as seats for resting (today just *makai* of Lanihuli Drive).

Across the road, in a Punahou pasture, was Nukalaiki, a *p haku* with the face of a man. From this point Maka pointed out stones on Puʻu o Mānoa (Rocky Hill), which may have been *m hele ina* or “division stones” used to mark the boundary line between Mānoa (chiefs and commoners division). The summit of Puʻu o Mānoa was also used to sight fish; if fish were sighted a signal was sent to the peak Puʻu o Pia, in the upper valley, to tell people to come down to fish.

At Keoneakeke, a sandy *makai* slope near the junction of Mānoa Road and East Mānoa Road, was a dangerous place. It was here that sweet potatoes growing on Round Top would be dislodged by high winds and come rolling and bouncing down to the road. This legend is also used to describe the one hollow area at the base of Round Top. According to Maka Woolsey:

The potato had once grown in a patch of an old couple. It grew larger and larger and the couple walled it up with sand, trying to cover it. One could see this sandy mound from great distances. One day the old couple went to Waiʻalaie to catch fish for the ceremony of *ʻuāla*. When they looked back to Mānoa, they saw that the potato had vanished. When they hurried back, they saw that it had rolled down the hill, resting in the hollow below. All the people of the area saw the great potato, made an *imu* (earth oven) and each one in the village had a piece of the great *ʻuāla* (Bouslog et al. 1994:112)

At Puʻu Pueo, the last hill of the lower valley was a cave where the owl, Pueo, watched over the valley. It is said that Queen Kaʻahumanu could see signals from Pueo from her house further up in the valley. Next was Kalumalu or “breadfruit shade,” the hill location of Puʻuhonua, the Castle home. At a gulch near the head of Castle Trail was a *k ʻuāla* or fish god stone name Kukalia. At this spot, fishermen could look down to the sea and search for schools of fish, such as *awa-noʻokina* (milkfish, *Chanos chanos*) and *holehole* (Hawaiian flagtail, *Kuhlia sandvicensis*), fish that traveled into freshwater. These came up Mānoa Stream, then went past Kaʻukūkūlu in Mōʻiʻiʻili, then to Kamakawitwili, then Kaumake, Hipawai, Halelena Stream to Kalehua, then Kukuio, and finally to Kawaihoʻolana and Hopenui (Bouslog et al. 1994:112).

The hero Kawelo once threw his *ʻiʻi*, or digging stick, which landed at Kukakaoʻo on the ridge. This land once had a wall built by the *menehune* across it. On the same ridge was a peak called Kahuluokapaʻa, which was *kapu* and “even the birds turned and flew around it.” (Bouslog et al. 1994:113).

At Kūkaōʻō were two companion *p haku* called Hauōla or “new life.” One could regain one’s health by sitting on these stones. On the nights of *P K ne* (27<sup>th</sup> night of the lunar month), one could see Huakaʻi, the headless man, on these slopes.

In the upper valley was the land called Kaʻaipū, a well-watered area shaded by *ʻhiʻiʻa* trees where Kamehameha III once built his retreat. Kaʻaipū is near the present site of the Waiʻoli Tea Room. Near here was also a *p haku*, who spoke to a local woman in a dream. The stone was covered with rubbish, and told the woman that if she cleaned the stone and moved it to her *l nei*, it would provide good fortune to her family for many years. When the family moved away and left the stone behind, only misfortunes happened to the next owners of the property. Finally, the original owners moved the stone to their new home in Kalihī-kai.

The adjoining land is Pūʻahuʻula, which has a gulch named Kūwuwowō, meaning “the place of the echo.” Any sound here forms an echo. Next is the land Kaukaohōki, meaning “the hanging star,” named because the *makaʻi inana* traveled by this place on the way to their taro patches in the upper valley in the early morning “by the light of the morning star.” There were six great taro lands in the upper valley. The most *mauka* was Kahaulani or “spreading *hau*.” Purple taro, called *mana ulu*, was grown at Hiʻiakawai, a part of Puʻulena. Kaʻahaiʻioa was a taro patch at the site of the coconut grove near Woodlawn. Other taro patches were Puolahu, Kukuio, and Kalehua.

Next was Pukaʻōmaʻomaʻo, the home of Queen Kaʻahumanu. *Makai* of the residence were the waters of Waiakeakua and a pool called Kawathoʻolana, which means “to float.” Only the Queen could use this pool: it was *kapu* (taboo) to everyone else. On the mountainside of Pukaʻōmaʻomaʻo, was Pukakomo, a natural opening into Pālolo Valley, which was used as a trail to this neighboring *athupuaʻa*. At Liliʻuokalani’s death in 1917, this opening was closed off by rocks. This may be the cave inhabited by Kamehameha and his troops during their invasion of Oʻahu (Bouslog et al. 1994:113).

Maka also knew many other mysteries of Mānoa. Along the cliffs of the left side she could point out where the burial caves were located. From any of these caves, fragments of *tapa* waved ever so gently as a sign of remembrance. She spoke of Pōki, the guardian dog of the valley, who if seen was a warning to the people of *kapu*. When you saw this dog, it was best to keep away from Mānoa. ʻOlohiʻi, the pig and dog *akaʻa* [god], who had no hair, was also known to Maka. This god lived in upper Mānoa at the site of *ʻakiʻaki* (rushes). (Bouslog et al. 1994:113)

### 3.4 Interview with Maka Woolsey about West Mānoa Valley

Maka Woolsey, a Chinese-Hawaiian businesswoman, was the granddaughter of Nāholowāʻa, who had moved to Oʻahu from Maui during the reign of Kamehameha II and received a three-acre *kūleana* in Mānoa Valley called Keaulana. With her second husband, George Woolsey, she became involved in the growing of taro and the sale of *poi* (pounded taro), becoming the proprietor of the Mānoa Woolsey Poi Factory. During the writing of the book “Manoa, the Story of a Valley” (Bouslog et al. 1994:99-104), she was interviewed about legendary places in the valley. The interview is written as if one is walking up the western valley on the old trail, now covered by Mānoa Road.

Maka Woolsey began her story at Punahou College. She pointed out the location of Pōhakuōla, a *p haku kapu*, or sacred stone in the long rock wall of Punahou School, marking the boundary of Kapunahou. The stone was placed there during the reign of the chief Pāki. Another sacred stone, Keapoapo, was also on the Punahou campus. According to Maka Woolsey (Bouslog et al. 1994:111), the two stones call to each other: “You come here,” says one, “No, you come here,” answers the other.

Heading into the valley, one next stopped at Kapukahau at the present junction of Hastings and Punahou Streets. A hut owned by Keʻiliani offered shade and rest to travelers. Further on was Keaeae, the “red in the rock.” This *p haku* was named for a legend concerning a young man named Keaeae, who was slain by his own family to save him from any possible misfortunes in his future life. When he was slain, this rock on the Mānoa path turned deepest red (Bouslog et al. 1994:111).

At the summit of the hill were once two high and two low stones, called *p haku kau kanaka*, which were placed as seats for resting (today just *makai* of Lanihuli Drive).

Across the road, in a Punahou pasture, was Nukalaiki, a *p haku* with the face of a man. From this point Maka pointed out stones on Puʻu o Mānoa (Rocky Hill), which may have been *m hele ina* or “division stones” used to mark the boundary line between Mānoa (chiefs and commoners division). The summit of Puʻu o Mānoa was also used to sight fish; if fish were sighted a signal was sent to the peak Puʻu o Pia, in the upper valley, to tell people to come down to fish.

At Keoneakeke, a sandy *makai* slope near the junction of Mānoa Road and East Mānoa Road, was a dangerous place. It was here that sweet potatoes growing on Round Top would be dislodged by high winds and come rolling and bouncing down to the road. This legend is also used to describe the one hollow area at the base of Round Top. According to Maka Woolsey:

The potato had once grown in a patch of an old couple. It grew larger and larger and the couple walled it up with sand, trying to cover it. One could see this sandy mound from great distances. One day the old couple went to Waiʻalaie to catch fish for the ceremony of *ʻuāla*. When they looked back to Mānoa, they saw that the potato had vanished. When they hurried back, they saw that it had rolled down the hill, resting in the hollow below. All the people of the area saw the great potato, made an *imu* (earth oven) and each one in the village had a piece of the great *ʻuāla* (Bouslog et al. 1994:112)

### 3.5 Settlement and Subsistence in Mānoa

Handy's (1940) description of Mānoa suggests it was once home to an extensive Hawaiian settlement supported by vast taro gardens:

In upper Mānoa the whole of the level land in the valley bottom was developed in broad taro flats. The terraces extended along Mānoa Stream as far as there is a suitable land for irrigating....About 100 terraces are still being cultivated, but these do not constitute more than one tenth of the total area capable of being planted....Bennett...described the upper valley as "checkered with taro patches." (Handy 1940:77)

The relative fertility and productivity of Mānoa is reflected in the "Indices of Awards," which lists 74 Land Commission Awards (LCA) in 21 named localities at Mānoa (discussed in detail below). These and other Land Commission documents attest to the substantial population of the area in the middle nineteenth century and presumably early. Coulter's (1931) population estimates for O'ahu (Figure 12) show a large settlement in the Mānoa Valley. In the late eighteenth century, King Kamehameha I's warrior-chiefs were attracted to the land for the cultivation of food for their invading army (T̄ 1959; Kamakau 1961).

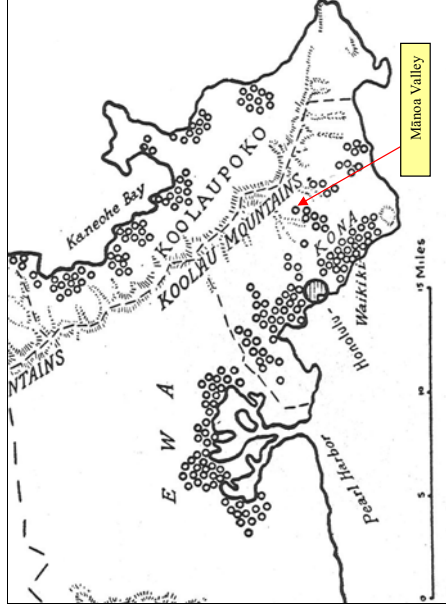


Figure 12. Portion of Coulter's (1931) population-estimate map for O'ahu in 1853 showing approximately 350 people in Mānoa Valley (each symbol represents 50 people)

### 3.6 Streams, Springs and Pōhaku

Mānoa Valley is watered by five tributary streams that merge to form the lower Mānoa Stream. The five tributary streams are 'Alhualama (literally, eat the fruit of the lama tree), Waihi (literally, trickling water), Nāniu'apo (literally, the grasped coconuts), Lua'alaea (literally, pit [of] red earth), and Waiakeakua (literally, water provided by a god). There are seven waterfalls in the back of Mānoa Valley, named Wai'ihī'iki (literally, small trickling water), Wai'ihī'nui (literally, big trickling water), Lua'aulaia, Nāniu'apo, Wa'aloa, Kahawai'iki (literally, little water tender) and Waiakeakua (literally, water [used] by the god) (Pūku'i et al. 1974). Several of these waterfalls in the back of Mānoa Valley are shown in Figure 13.

The 'ihī of Kānewai was given to Kaleiheana, a warrior ally of Kamehameha I, after the battle of Niu'uano in 1795. When Kaleiheana died the land was deeded to the descendants of Kamehameha and finally became part of the Bernice Pauahi Estate. In 1945, the land was deeded to the University of Hawai'i, which evicted several farmers who were still growing taro. The abandoned taro *lo'i* were rediscovered by students at the college in 1980, and were cleared and restored. This restored area was called the Kānewai Cultural Garden.



Figure 13. Waterfalls in the back of Mānoa Valley as seen from Kanānā (photograph from Bouslog et al. 1994:4)

### 3.7 Trails of Mānoa

Several place names within Mānoa are located on a map of early nineteenth century trails as described by John Papa 'Ī'i (Figure 14).

Our description of the trails of the royal town is finished, but we have not yet told of the trails going to lower Waikiki, Kamoiliili, and Manoa. . . . At Kawaiaha'o a trail passed in front of the stone house of Kaina, late father of Kikaha. The trail went above Kalanipuu's place, along the stream running down from Poopoo to the sea, close by Kaahee in Makiki, to Puu o Manoa, then below Puupueo, where a trail branched off to upper Kaaipu and Kahoiwai, and another to go below Kaahulue, to Kapulena [Pu'ulena] and Kolowalu. ('Ī'i 1959:92)

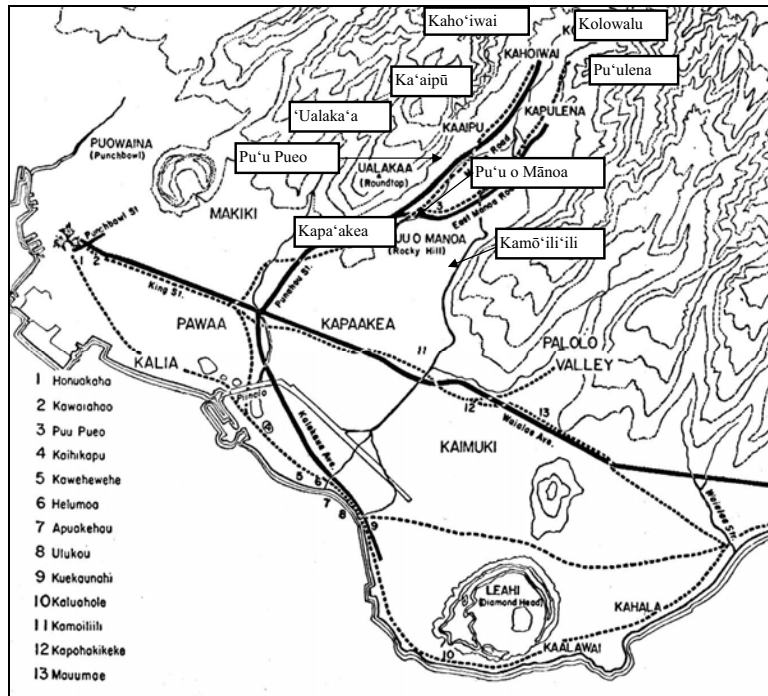


Figure 14. Early nineteenth century trails on the southwest coast of O'ahu (illustration from 'Ī'i 1959:93), showing locations of some place names in Mānoa

### Section 4 Historical Background

In 1792, Captain George Vancouver described Mānoa Valley on a hike from Waikīkī in search of drinking water:

We found the land in a high state of cultivation, mostly under immediate crops of taro; and abounding with a variety of wild fowl chiefly of the duck kind . . . The sides of the hills, which were in some distance, seemed rocky and barren; the intermediate vallies, which were all inhabited, produced some large trees and made a pleasing appearance. The plains, however, if we may judge from the labour bestowed on their cultivation, seem to afford the principal proportion of the different vegetable productions . . . At Wo'aho'o [O'ahu], nature seems only to have acted a common part in her dispensations of vegetable food for the service of man; and to have almost confined them to the taro plant, the raising of which is attended with much care, ingenuity, and manual labor. In the several parts of its culture, the inhabitants, whether planting, weeding, or gathering, must, during the whole of these operations, be up to their middles in mud, and exposed to the rays of a vertical sun . . . (Bouslog et al. 1994:9-10)

Exactly one century later, before it was urbanized, the beauty of Mānoa Valley was described by Thrum:

Manoa is both broad and low, with towering hills on both sides that join the forest clad mountain range at the head, whose summits are often hid in cloud land, gathering moisture there from to feed the springs in the various recesses that in turn supply the streams winding through the valley, or watering the vast fields of growing taro, to which industry the valley is devoted. The higher portions and foot hills also give pasturage to the stock of more than one dairy enterprise.

. . . For nearly a mile the road leads by or along pasture fields with no vestige of tree or shrub other than the lantana pest and an occasional algeroba (kiawe), and passes along Round top or Ualakaa . . .

At this summit of the road the whole valley opens out to view, the extensive flat area set out in taro, looking like a huge checker-board, with its symmetrical emerald squares in the middle ground, surrounded by pasture fields on the slopes at the base of the guarding hills. Here and there 'mid sheltering trees, humble dwellings dot the scene around, while up the rugged slopes the almost endless shades of green with black worm seams of rock oft times lightened by 'silvery thread of torrent', forms the background to one of the most charming pictures, either in the clear sunlight, heightened as it often is by cloud shadows chasing rifts of sunshine down the mountain sides; or, as frequently, may be, to watch the drifting mist or rain sweep down one side of the valley, while the other basked in the sun, throwing over its weeping neighbor a "bow of promise" so radiant and bright that its-double, or even triple, reflection is no rarity. (Thrum 1892:110-111)

Mānoa Valley was a favored spot of the *ali'i*, including Kamehameha I, Chief Boki (Governor of O'ahu), Ka'ahumanu, Ha'alilio (an advisor to King Kamehameha III), Princess

Victoria, Kana'ina (father of King Lunalilo), Lunalilo, Ke'elikōlani (half sister of Kamehameha IV), and later Queen Lili'uokalani.

The site of the various houses that once sheltered Haalilio and his retinue is pointed out just above the old Ehu homestead, known later as the 'Charley Long' premises and, till very recently, part and parcel of Montana's Kaipua Diary. Rev. H. Bingham, of early Hawaiian Mission fame, is also referred to by old timers as having had a residence adjoining the Haalilio premises, though his history makes no mention thereof. (Thrum 1892:114)

#### 4.1 Early Ownership and Use of Mānoa Valley

Mānoa was given to the chief Kame'eiamoku by Kamehameha I after his conquest of O'ahu. After Kame'eiamoku's death, the land was inherited by his son Ulumāhiehie (or Hoopili), who became the governor of Maui during the reigns of Kamehameha II and Kamehameha III. Liliha, the daughter of Hoopili, inherited the lands in 1811 and brought them with her to her marriage with the high chief Boki, governor of O'ahu. They had a residence at Punahou in Mānoa Valley which they often used (Bouslog et al. 1994:14-15). As noted previously, the entire floor of Mānoa Valley was a "checkerboard of taro patches."

Boki traveled with Kamehameha II on his ill-fated trip to England. While there, Boki met John Wilkerson, a British agriculturalist who had once been a planter in the West Indies. Boki and Wilkerson traveled back to Hawai'i on the English ship *Blonde*. In 1825, Wilkerson planted seven acres atop Punahou Hill (Pu'u Pueo) with sugar cane, the first sugar plantation in the Hawaiian Islands.

I ka makahiki 1826, ua hoomaka ia ke kanu koana ma Manoa, he haole Bertiania ka mea nana i hana. O Boti a me Ke'uanaoa kekahi mau alii kokua nui i ka mahi ko, a o ia paha ka hoomaka mua ana o ka wili ko ma Hawai nei. A i ka haalele ana o ka haole, ua lilo ka wili ko ia Boti, a o Kinepu ke kanaka nana e hooponopono. Ua kukulu ia ka hale puhi ko ma loko o ke kulamakaualae o Honolulu, ma ka pa kokoke i kahi o Keolaloa Sumner ma e noho nei. He mau hana maikai keia a Boti. (Kamakau, Ka Nūpepa Kū'oko'a, May 23, 1868)

Translation:

In 1826 the cultivation of sugar was begun in Manoa valley by an Englishman. Boki and Ke-ku ana'o were interested in this project and it was perhaps the first cane cultivated to any extent in Hawaii. When the foreigner gave it up Boki bought the field and placed Kinepu in charge. A mill was set up in Honolulu in a lot near where Sumner (Keolaloa) was living. For this action Boki is to be commended. (Kamakau 1992:278)

Wilkerson died in 1826, the mill for the sugar was moved to Honolulu, and Boki lost interest in the endeavor. In 1828, he sold the sugar plantation and sugar mill (or took as partners) to four Honolulu businessmen: William French, Stephen Reynolds, John C. Jones, and John Ebbets (Kuykendall 1938:172). French encouraged Boki to turn the sugar mill into a distillery. When Ka'ahumanu heard of this, she was outraged and took the Punahou lands away from Boki and gave them to Hiram Bingham and his wife as a base for mission work.

John Wilkerson was also the first to try to grow coffee in the islands.

At the foothills just above Kaipua, is the reputed location of the first Coffee nursery of the islands, also the work of John Wilkerson, with plants brought by him in the Blonde, from Rio de Janeiro. All the shady recesses and glens at the head of the valley show evidences, to-day, of this early agricultural effort, but to no pecuniary or commercial advantage, for it is all neglected and overgrown. (Thrum 1892:114)

Captain John Kidwell brought a variety of pineapple to the islands called Smooth Cayenne in 1885. He conducted experiments with 31 varieties of pineapples on his farm, in the vicinity of current campus. Smooth Cayenne worked best, and this variety became the standard for the pineapple industry. The sugar cane plantation was destroyed, but some of the coffee plants were used to start coffee cultivation on the islands of Kaua'i and Hawai'i (Bouslog et al. 1994:15). The only remaining structures associated with this endeavor noted by Thrum in 1892 were a few filled-in cisterns and wells, and stones marking the western side of the sugar house foundation.

Prince Tute of Tahiti, who became the tutor of Kamehameha III, was also given a piece of land by Boki, in a lot adjacent to the sugar plantation. During the Māhele, he enclosed his lot with a stone wall. Tute died in 1859, but his descendants (the Summers) continued to live in the area, which later became part of the Montiano ranch, and then part of the fruit farms owned by Carlos Long (Bouslog et al. 1994:16). On the 1882 Baldwin map (see Figure 7), Ha'alilio and Tute are shown owning two pieces of adjoining land in Kalehua and Pu'upu'e. Queen Lili'uokalani later owned land on the old Brening premises bordering the land of John Stevenson. Ka'ahumanu had a great estate in the upper valley, which included the lands of Pu'ulena. After the deaths of Boki, Liliha, and finally Ka'ahumanu in 1832, many of these royal lands were given to Charles Kana'ina, the father of King William Lunalilo. Kamehameha II was also said to have maintained a summer house in Wai'oli and Ka'aipū. Lunalilo gave some of these lands to Kapōkōkō, who gave them to Ha'alilio. When Ha'alilio went on a diplomatic mission to England, he returned the lands to Kamehameha III (Bouslog et al. 1994:16).

An 1817 map by Otto Kozebeue (Figure 15) and an 1855 map by La Passe (Figure 16) show a dense concentration of population in Mānoa Valley. In 1836, French missionaries visited Mānoa, counting 50 houses. If each house contained five people, this would put the population at 250 Hawaiians. The general population of Honolulu and the coastal plain was about 6-7,000 people (Coulter and Serrao 1932:109), which probably represented only a small percentage of the total population of the area that existed before the Hawaiian people were decimated with war, exotic diseases, and the disruption caused by the influx of Westerners and Asians, and their influence on the economy and culture of Hawai'i. An 1847 record lists 34 eligible landowners; only two were non-Hawaiian. An 1849 tax list includes 195 Hawaiian names, meaning the population of Mānoa was probably about 1,000.

#### 4.2 Mid Nineteenth Century and Land Commission Awards

A total of 68 commoners were granted *kuleana* (Land Commission) awards in Mānoa *makai* of King Street, totaling 332.26 acres (Figures 17, 18 and 19; Table 1). Twenty-seven awards were less than an acre; 31 awards were less than five acres, four awards were less than 10 acres; and one award was for more than 10 acres (to 'Akahi, a *wahine* [female] cousin of Bernice



Pauahi Bishop, in Kaipua 'ili, LCA 5368:1, RP 1262, 10.25 acres; five awards were for more than 30 acres (J. Stevenson [Ka'aipū, 34.96 acres, and Nānu'apo, 30.17 acres], Kaleheana, 66.59 acres, Kaunohua, 35.40 acres, and Beckley, G. for heirs, 36.10 acres). Victoria Kamāmalu received most of Kānewai 'ili; C. Kana'ina (father of King W.C. Lunali'ilo) received the 'ili *aiua* of Kolowalu and Pāmoa, and all of Kukui and Kalehua. The largest grant went to the American Board of Commissioners for Foreign Missions who received a total of 301.68 acres; this became the campus for Punahou School (Bath and Kawachi 1990:3-5). Chief Boki gave Hiram Bingham this piece of land in 1829 (DeLeon 1978:3).

The Land Commission documents suggest that most of the agriculture and habitation at Mānoa was in the east-central part of the valley (along Mānoa Stream) between the present-day Mid Pacific Institute and the Chinese cemetery. There were a few claims and awards in the far northern part of the valley, at Punahou, and a few in the Kānewai/Kalaeōhaku area.

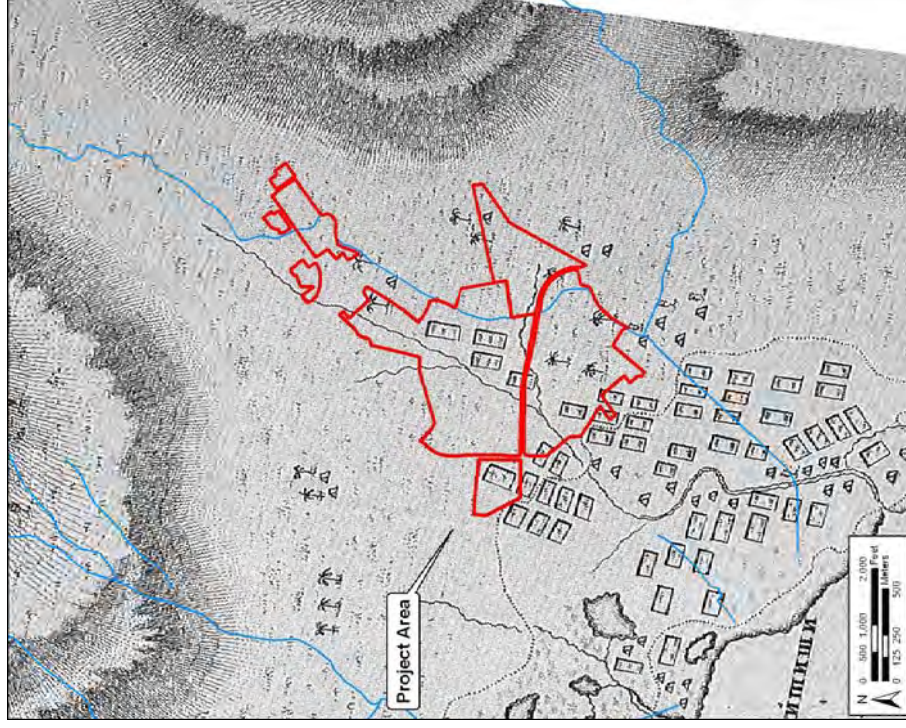


Figure 15. Kotzebue map of 1817 showing vicinity of project area (should be understood as somewhat schematic)

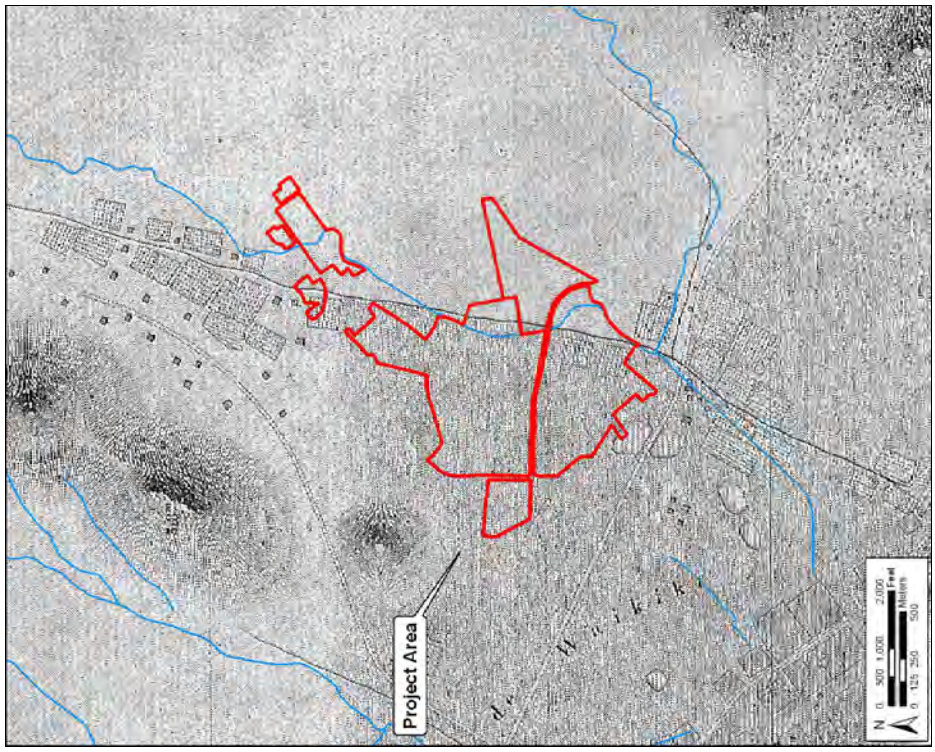


Figure 16. LaPlace map of 1855 showing vicinity of project area (should be understood as somewhat schematic)

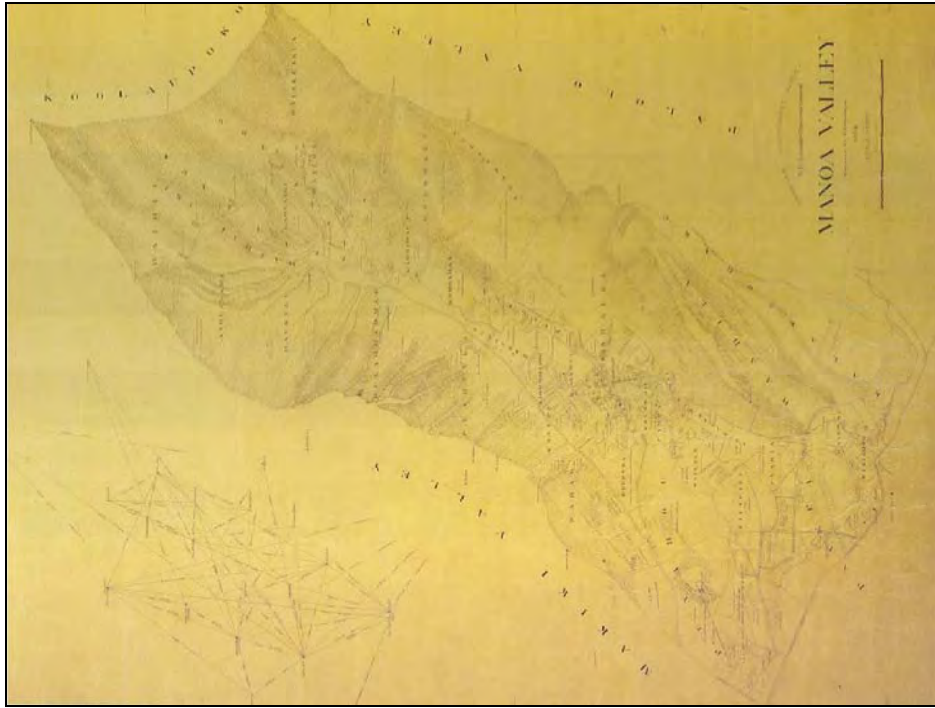


Figure 17. 1882 E. D. Baldwin map, showing Land Commission Awards and Grants in Mānoa Valley





Table 1. Land Commission Awards for Mānoa Ahupua'a

Claim	Claimant	Location	Notes
17	Jones, Eli	Beretania St.	House
40	Kai, D.	Ka'ahaloa	Māhele Award
42	Maigret, Louis	Waialeale	
228	Kaleihema	Kānewai	Kānewai Pool
387	ABCFM (mission)	Punahou	Received from chief Boki: spring, house
707	Kānina		Received land from Kamehameha
819	Beckley, George	Waialeale	Farm called "Kawaiale"
1130			House, 2 patches, pasture
1267	Kawela	Pa'ākea	3 * pana: taro lo'i; taro lo'i; house
1273	Spear	King St.	
1274	Hullilau	Piliamo'o	Dry taro, 12 taro lo'i, hala trees
1356	Namaka	Piliamo'o	2 taro lo'i
1525	Kuanaa	Piliamo'o	2 taro, houses, pasture
1617	Kenao	Piliamo'o	4 taro, 1 ditch, 2 houses
1627	Kōonea	Kānewai	
1636	Haole	Pa'ākea	2 * pana: house, fence; houses, fence
1728	Kuikuikahi	Haleleena, Waialeale	3 * pana: pahale (house); lo'i ma hale lena; taro lo'i, pasture
1733	Kahemalu	Haleleena	4 lo'i
1734	Kaahi	Hamamakawaha, Hipawai	2 * pana; house enclosed; 6 taro lo'i
1744	Hakoule	Waialeale	5 taro lo'i
1748	Ono	Kānewai	House/lot
1751	Aea	Piliamo'o	3 * pana: house; taro lo'i; taro lo'i
1755	Kaluapana, Peter	Hamamakawaha	
1769	Malaihi	Hamamakawaha,	
1806	Hinai	Kahamama	Taro lo'i
1813	Keeka, I.	Kānewai	3 taro lo'i
1816	Kaaha	Piliamo'o	2 taro lo'i
1825	Kuewa	Pa'ākea	2 * pana: 6 taro, pasture; taro lo'i
1827	Wahahee	Kānewai	* pana 3-4 - Pasture with 2 houses; * pana 5 - taro
1828	Ewaloa	Waialeale	6 taro lo'i
1829	Hooohoku	Waialeale	3 * pana: taro lo'i; taro lo'i, house
1831	Mamala	Waialeale	8 taro lo'i
1906	Kaumakoeka	Pāmoa	3 * pana, 8 taro lo'i; * auwai, house; taro lo'i; house
1908	Kalaua	Hamamakawaha	House at Kolowalu
1909	Kataniui	Kamo'olepo	4 lo'i
1910	Apiki	Kolowalu	* Auwai, 6 taro lo'i, house/lot
1911	Nāihe	Kolowalu	* Auwai, pili, taro for komohiki
		Hamamakawaha	Taro, house

Claim	Claimant	Location	Notes
1918	Kamahāni	Kolowalu	2 * pana: pahale; 6 lo'i
1920	Paaluhū	Pū'ulena	3 taro lo'i, pasture, house
1921	Moku	Kahawai	9 taro lo'i, kula, house
1922	Nawaani	Kali'i	13 lo'i, sweet potato
1923	Kekua	Kaho'iwai	6-8 lo'i, * auwai, house
1924	Keolohapanole	Kaula'a	3 * pana; 7 taro lo'i; taro lo'i, house on south side; pasture
1925	Paniani	Koloalu, Koloalūki	* Auwai, pili, pasture, 2 houses
1925	Koi	Kolowalu	Pili, taro, land sinking in
1926	Nannuki	Kolowalu	1 * pana: pasture, house; taro
1927	Nawaakakele	Pāmoa	12 lo'i, kula, house
1928	Aiia	Pū'ulena	4 taro, pasture with house
1929	Kaamana	Pū'ulena	Lo'i for komohiki; * auwai, pasture
1930	Kaaca	Pū'ulena	2 * pana: taro lo'i, pasture, house/lot; lo'i for komohiki
1931	Kaiwi	Pū'ulena	9 taro, pasture, house
1935	Puuwaeuae	Kamamakohaha,	
1937	Kahalepohaku	Hāmamo	7-8 taro lo'i
1938	Lupe	Pū'ulena	6 taro lo'i, pasture, house
1940	Upepe	Kamo'olepo	2-4 taro lo'i
1944	Maema	Pū'ulena	Taro lo'i, pasture
1945	Kamakaui	Komoawaa	14 taro lo'i, kula
1946	Makali	Komoawaa	6 taro lo'i
1947	Puuki	Komoawaa	16 taro lo'i, kula, house/lot
1948	Ma	Komoawaa	6 taro lo'i, kula, house/lot
1949	Kipi	Hipawai	7 taro lo'i, kula, house/lot
1950	Kalia	Hipawai	13 taro lo'i, kula
1951	Nui	Kaho'iwai	3-4 taro lo'i
1980	Haole	Piliamo'o	Taro lo'i, house
2209	Keulana	Kaapuluna	Kālo taro & kula; pasture named
2216	Kaohle	Pāmoa	2 * pana: 16 taro, watercourse; house site near taro
2218	Kaawaha	Pāmoa	4 * pana: taro lo'i and pasture in each
2219	Keawe	Kamo'olepo	2 taro lo'i
2362	Keulana	Pa'ākea	Kālo taro & kula; pasture named
2530	Kaahu	Piliamo'o	2 taro lo'i, pandanus, house
3028	Kaui	Punahou	
3322	Tute, T.	Haliimaile	Garden farm with stone wall
3906	Neki, K.	Kolowalu	Heiau of Kūka'o, fence; house in
4211	Kaulahaui	Kaahaloa iki, Mānaha	10 taro patches & pasture in one
4294B	Kalaweauamoku	Pāmoa, Ka'ahaloa	2 * pana

Claim	Claimant	Location	Notes
4605	Hakau, wahine	Kaho'i'wai, Kahoohau, Hokeulu, Pt.'inato	6 * <i>pana</i> : 5 taro <i>lo'i</i> ; 3 taro <i>lo'i</i> ; pasture; 1 ditch; 1 ditch; 1 fish pond
5368	Akahi	Ka'apū	8 taro <i>lo'i</i>
5579	Kahapapa	Hipawai	5 taro <i>lo'i</i> ; Kahawai Stream
5937	Paukuwahie	Piliamo'o	Loko Kūwili
6450	Kaunohua	Pu'ulema	
6616	Niuamu	Kānewai	
6712	Paikau	Kalena, Waialele, Pu'ulema	3 * <i>pana</i> : 2 <i>lo'i</i> ; <i>kala</i> house; mountain land; 28 <i>lo'i</i> , <i>kala</i> , house
7713	Kāmamalu, Victoria	Kānewai	
8555	Kāna, M.	Maka'īlio	4 <i>lo'i</i> ; <i>auwai</i> , pasture
8559	Kanaina, C.	Kukuhio, Pānopa	2 * <i>pana</i> : taro; <i>'i'i</i> of Kalowalu
8957	Kuhaimea	Ka'āhala	5 taro <i>lo'i</i> , house 2 <i>hala</i> trees
8958	Kahale	Ka'āhala	1 taro <i>lo'i</i> ; <i>kala</i> , house
8959	Kuamoo	Ka'āhala	8 taro <i>lo'i</i> , sweet potatoes
10289	Namokae	Halelepa (Halelela)	2 * <i>pana</i> : 6 taro patches, pasture
11029	Stevenson, John	Ka'apū, Kapo, Kukona, Kamakēla	3 * <i>pana</i> : <i>pali</i> , pasture (22 acres); pasture, <i>kalo</i> , stream (9 acres); <i>kalo</i> (2 acres)
11306	Kalana	Halelela, Kolowalu	2 * <i>pana</i>
11307	Kea	Kolowalu	9 <i>lo'i</i> , house site

### 4.3 The University of Hawai'i at Mānoa Land Commission Awards

Charles S. Bouslog (in Kobayashi 1983:183) gives the following summary account of the history of Hawaiian tenure of the University of Hawai'i at Mānoa lands:

The grantees of land at the mahele (mostly 1848-50) have their names recorded forever in all subsequent deeds and title search leads back to the first owner. All but one of these names for campus land were Hawaiian. Names seen are Ewaloa, Kapehana, Kaunakapili, Mooiki, Ono, Poonui, Puoa, Hakuole. Charles Kanaina (the father of King Lunalilo) at mid-century was the owner of much of the Mauka Campus and of the large areas now in the Lyon Arboretum. For most of these men, it is a one-time legal enshrinement; few of the names are seen again, except in deed.

I have attempted to trace the ownership changes of some of the original grants: 718, 882, 1744, 1748, 1828 (see the 1882 map).

In the "Native Register" (p. 270) Ewaloa signed with his mark. There is a reference to his widow in 1876, and to an heir in 1881, when the land passed into the hands of Emma Davison. No more Ewaloa.

Hakuole has modern descendants but the land is no longer theirs. For Land Grant 1744, he made his mark in the "Native Register" and testified: "I got this land in 1830...for taro land for cultivating sweet potato at Kawailele in the land of Lui Palani (Louise French), the konohiki." This was on December 3, 1847. An heir sold to Ilikealani in 1864. The family continued in the valley. One man is listed as a Manoa taro planter in the city directory of 1888. In 1894-95 one is listed as living in Manoa. The last kuleana seems to have been sold to a Magoon in 1896.

The largest parcel in Mānoa (LCA 228, 66.59 acres) for a private individual was awarded to Kaleheana at Kānewai. John Papa 'Ī'i (Native Register; August 14, 1846) relates the following

Kalaiheana's land, called Kanewai, is at Waikiki. It has some leles in Mānoa . . . that was the land of Keaumoku at Waikiki, adjoining the north side of Kalaepohaku. This land became his upon the victory of Kamehameha I at the Battle of Nuuanu, also Waialua, as was the custom of granting land to chiefs at that time.

When the *peleleu* (Kamehameha's fleet of large canoes) came, the land passed from Ke'eaumoku to Papa and Kaleiheana and all the *leles* were also conveyed. In Foreign Testimony, 'Ī'i relates the following:

Kanewai is its name. It borders on the sea which enters part of it. On S. and E. is land of Kalaepohoku on NE & N is land of Waihi. From NW & W round is Piliamo. On W. Keokapu has land. This land belonged to Kiaumoku father of Kaahumanu. . . . When Kiaumoku obtained it was in 1804. Claimant is his descendant.



This later account is particularly interesting because of the reference to Kānewai bordering “on the sea which enters part of it.” This corroborates the account in the *Star Bulletin* (Williams 1935) of a subterranean passage linking Kānewai and the sea, and suggests that the famous Kānewai pool lay in Kaleiheana’s LCA. The reference to LCA 228 being bordered on the northeast and north by the land of Waihi is uncertain, but may refer to springs or seeps on the nose of Wa’ahila ridge (Waihi – “trickling water”).

Testimony relating to Kelipio’s land claim (LCA 1635, 0.43 acres) is of particular interest in that it provides the clearest picture of land use in Kānewai. The Native Register offers the following account:

‘Ili of Kanewai, Ahupua’a of Waikiki. I have two lo’i. My lo’i on the west is bounded on the north by the lo’i of Kalama, on the east by the Kūla of Maalahā, on the south by the lo’i of Kalama, on the west by the lo’i of Kanemakini, one small house.

The Foreign Testimony offers the following accounts:

This land is Kanewai, Waipio, Waitii. Kalo land only. No house or fence. Mauka is a stream dividing it from upland Waialae, Kalama [is] Konohiki; Makai Stream and wasteland; Honolulu, Kalama. Claimant had this from Kalama about 8 years ago on account of friendship and work.

One taro patch and the boundaries are Mauka is the ditch; Waialae, [lands of] Kalama; the Konohiki, Makai a stream; Honolulu, Kalama the Konohiki. Acquired in 1841, he has done Friday work for the Konohiki.

The testimony for Kelipio’s land claim suggests there were a number of small *lo’i* (irrigated plots) in the area north of Mānoa Stream and south of the ‘*auwai* (irrigation ditch), which were cultivated by different people with a number of *lo’i* belonging to the *konohiki* (overseer) named Kalama.

The land claim of Nu’uanu (LCA 6616:1, 0.96 acres) lists three *lo’i*, four coconut trees, a small sweet potato *kala* (dryland plot), and a house lot. While it is not clear whether these are all in ‘*puna* (lot) 1, it seems a virtual certainty that he claimed a *lo’i* there.

The testimony associated with Keonea’s land application (LCA 1627) relates that “Kaleiheana gave claimant these lots” and the presence of *lo’i* and a house lot on the property.

Figures 20 through 24 illustrate some aspects of land use changes from the 1880s to the end of the nineteenth century in and around the project area.

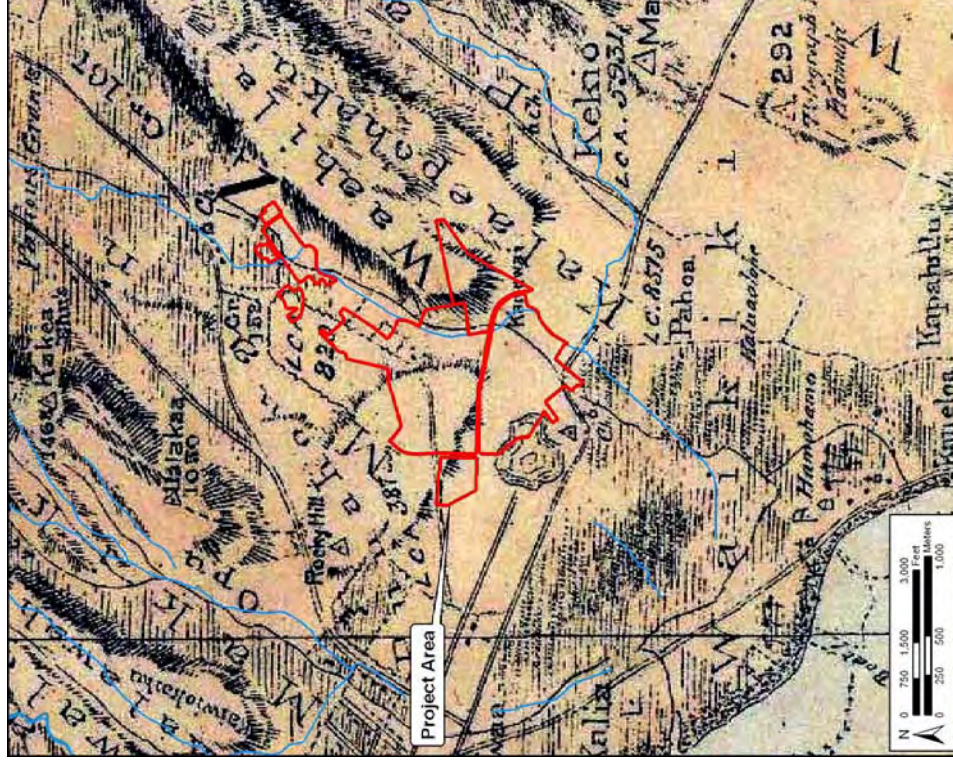


Figure 20. 1881 O'ahu Island Government Survey map



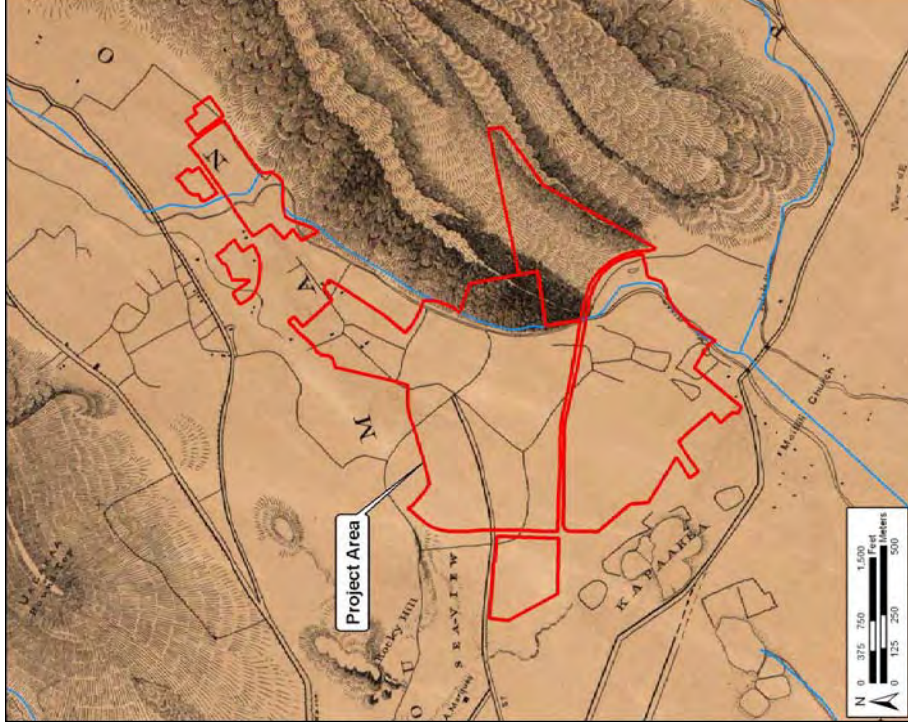


Figure 22. 1887 W. E. Wall map showing vicinity of project area

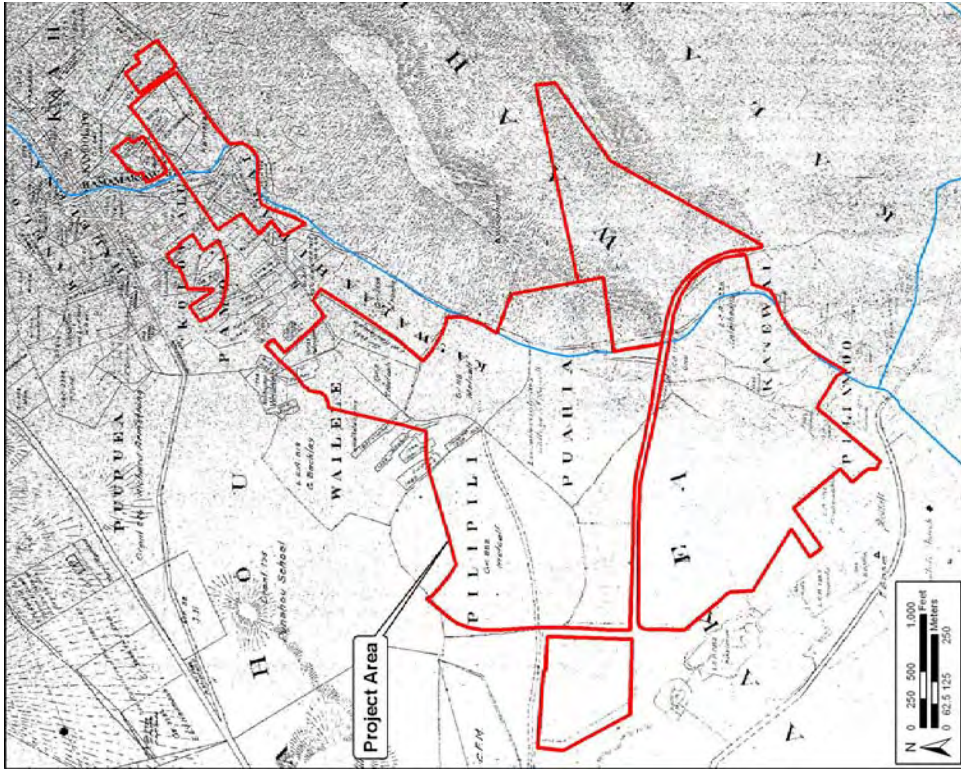


Figure 21. E. D. Baldwin map showing vicinity of project area





#### 4.4 1900s to Present

Hawaiians and Chinese continued to grow taro on the floor of Mānoa Valley in the late nineteenth century (Figure 25). However, disease, out-migration to the centers of population, the loss of traditional culture, and other factors led to a decimation of the resident Hawaiian population. By the end of the century, half of the taro lands in Mānoa Valley were cultivated by Chinese. They also raised other vegetables and bananas. For a time pineapples were raised on the lower slope between Pu'u Pia and Wa'ahila Ridge (the eastern boundary of the *ahupua'a*) (Emery 1956:57).

The well watered, fertile and relatively level lands of Mānoa Valley supported extensive wet taro cultivation well into the twentieth century. Handy and Handy (1972:480) estimated that in 1931 "there were still about 100 terraces in which wet taro was planted, although these represented less than a tenth of the area that was once planted by Hawaiians."

In the early part of the nineteenth century, the Japanese began to move in to the upper valley to start truck farms, growing strawberries, vegetables, such as Japanese dry-field taro, Japanese burdock, radishes, sweet potatoes, lettuce, carrots, and soy beans, and flowers to sell to the Honolulu markets. Bananas were grown on the northeastern slopes of the valley. Several dairies were also opened in the area, including the first opened by William Harrison Rice in 1844. The result of the presence of these dairies was that many previously forested slopes were denuded by the grazing cattle (Emery 1956:57, 62).

Rice cultivation was attempted in Mānoa Valley by 1882, but the project was unsuccessful.

Though the valley is under almost complete cultivation of taro, largely by Chinese companies, an effort was made by them in 1882 to divert it to the growth of rice, but after two years struggle with high winds, cold rains and myriads of rice birds it was abandoned. In the spring of 1884 a north wind, with the local appellation of Kakea, visited the valley, which blasted all the taro, withered all the growing rice, moved a number of houses bodily and demolished several entirely. This is said to have terminated the rice industry of Mānoa, since which time its fields have been devoted to taro, as it had been for many preceding generations. Sweet potatoes and bananas are also cultivated in a limited measure, and some attention is being given to fruit culture . . . (Thrum 1892:116)

In the 1903-04 Honolulu City Directory, 148 names are listed, 107 haole (Caucasian), 11 Chinese, 9 Japanese, and 21 Hawaiians. In 1932, the valley had 1,000 homes (with an estimated population of 5,000), about 300 Caucasian, 173 Japanese, ten Chinese, ten Portuguese, six Hawaiian, five Puerto Rican, two Filipino and one Spanish (Coulter and Serrao:1932:109). By 1944, the population of Mānoa was 15,000. By the year 2000, Mānoa had a population of 21,112 (City and Co. of Honolulu 2000). Figures 26 through 31 show the growth of roads and residential areas during in Mānoa from the early to middle twentieth century.



Figure 25. Checkerboard taro fields on the floor of Mānoa Valley

Cultural Impact Assessment for the UH at Mānoa Long Range Development Plan Project

TMKs 112-8-015:001; 2-8-023:003; 2-9-004:005; 2-9-023:001 & 026; 2-8-029:001; 2-9-026:001 & 037; 2-9-027:054; 3-3-056:001 & 004



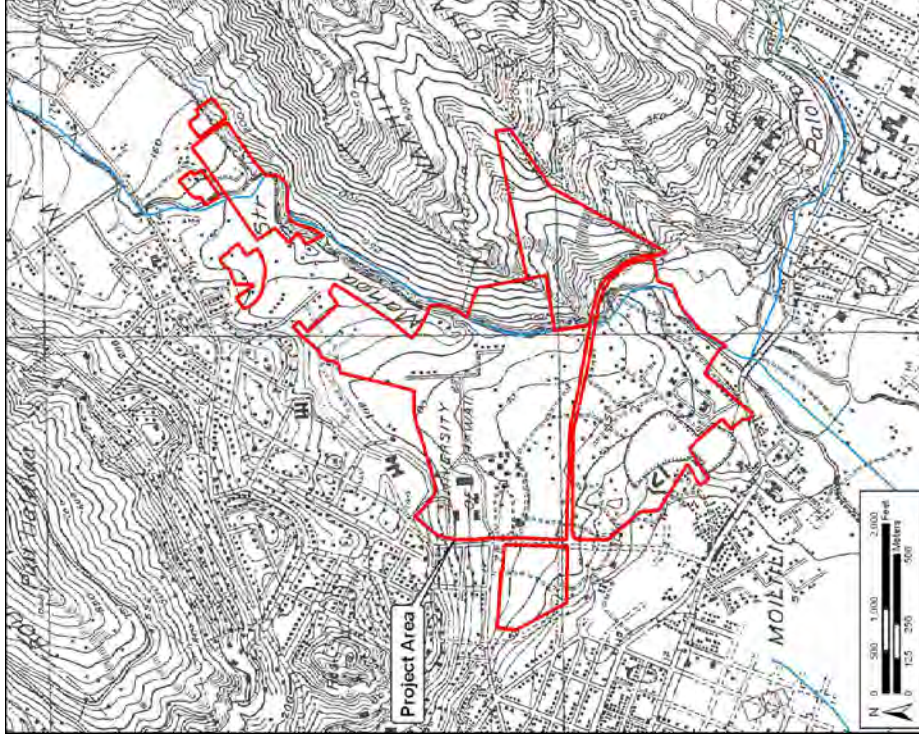


Figure 27. 1927 US Geological Survey map showing vicinity of project area

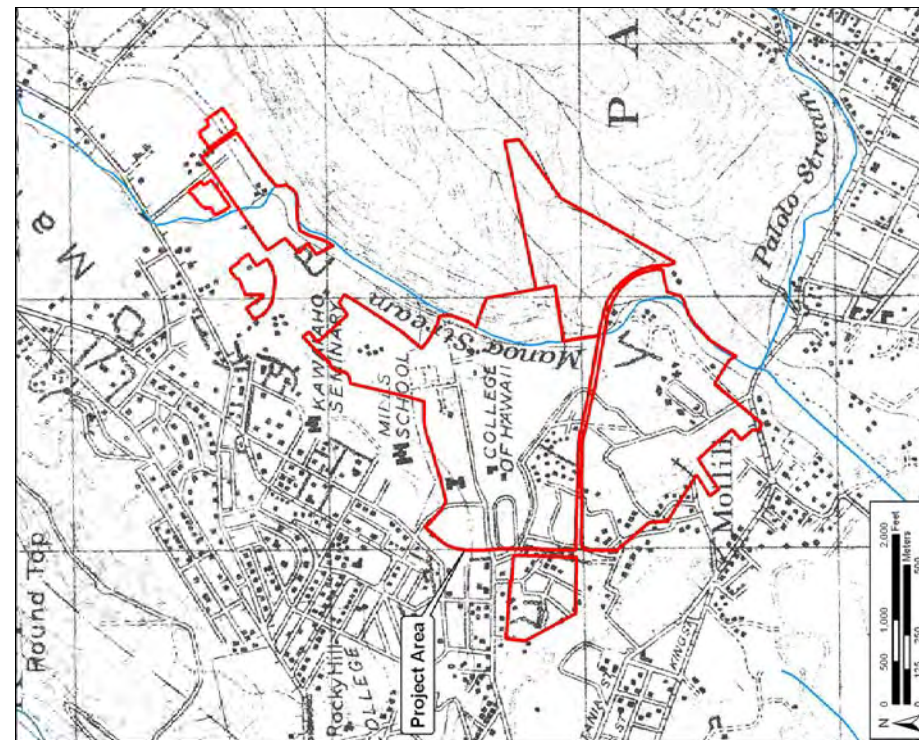


Figure 26. 1919 Fire Control map showing vicinity of project area



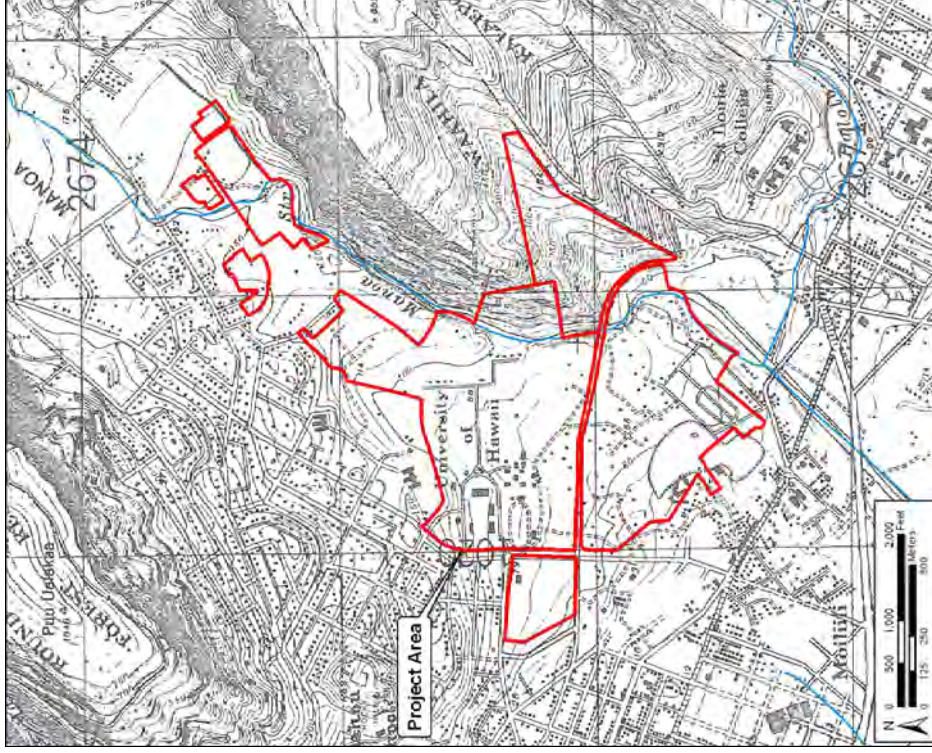


Figure 29. 1943 War Department map showing vicinity of project area



Figure 28. 1938 map showing vicinity of project area



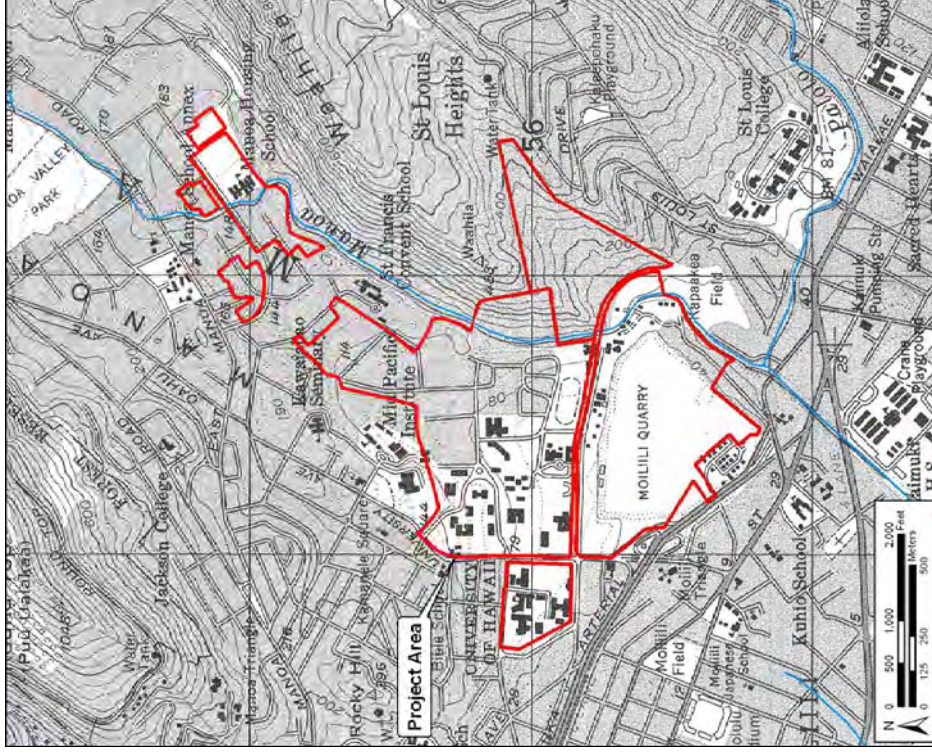


Figure 31. 1956 map showing vicinity of project area

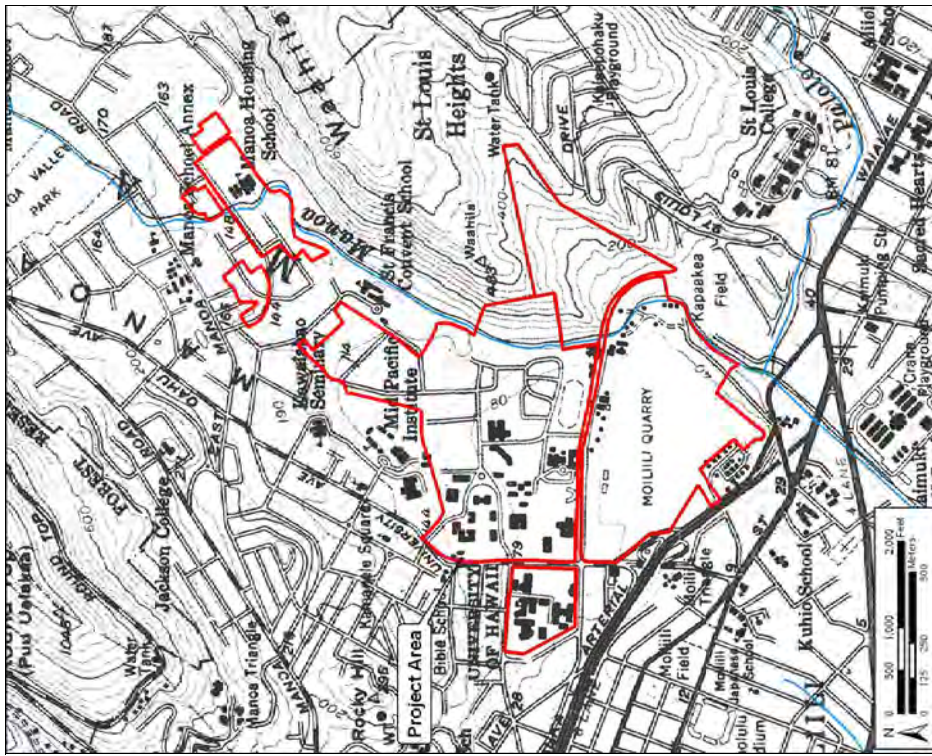


Figure 30. 1953 U.S. Geological Survey map showing vicinity of project area

## 4.5 Prominent Historic Structures

### 4.5.1 Mānoa Chapel and Cemetery of Kawaiaha'o Church

In 1832, the missionaries Hiram Bingham, Abraham Blatchely, Levi Chamberlain, and Elisha Loomis hiked into Mānoa Valley to look at two parcels of agricultural land that had been appropriated for the use of the Mission by Kalanimōkū, the Prime Minister of the Hawaiian Kingdom. One plot was on the western side of "Ualaka'a in West Mānoa; the other was an acre and a half of low taro ground with thirty to forty taro patches in East Mānoa; this land was probably at the site that later became the Mānoa Chapel and the Mānoa Hawaiian Cemetery. At Ka ahumanu's residence in Puka'ōma'oma'ō, there was a "kind of village of forty of fifty huts, the houses of the chiefs, a schoolhouse and a chapel" (Diary of Elisha Loomis, cited in Bouslog et al. 1994:153). The cemetery, which may have predated the chapel, is said to have been established by Ka'ahumanu for a Christian cemetery.

In 1846, Reverend Richard Armstrong wrote: "in the beautiful valley of Mānoa, there is an encouraging state of things . . . A substantial stone meeting house has been erected under the direction of Bro. William Harrison Rice, intended also for a school house." This stone church may have been built on land once owned by John 'Ii, who had early bought fee simple land near the present junction of the upper ends of Mānoa and East Mānoa Roads. In a letter from Armstrong to the Honolulu Mission in May of 1848:

Brother Rice has had charge of the meeting in Manoa Valley and I hope he will present an account of his labors there to the Mission. A substantial stone meeting house has been erected there under the direction of Brother Rice, intended also as a school house, and an adobe building for the same purpose at Waikiki. . . . While erecting the houses we feared they would prove too large, but during the present year they have been filled with attentive worshippers on Sabbath afternoons and, frequently, during the week. (Gulick 1918:235)

This building was destroyed in 1876 by a severe storm, but a wooden structure with some stone work was quickly rebuilt to replace the chapel. In 1914, the lot was granted to Kawaiaha'o Church, which managed it as an ' *puna*, or branch church. In the 1930s, a third church was built to replace the termite-eaten second church. This church, called Luakini Hou O Mānoa (The New Church of Mānoa) was dedicated in 1935. This building was a wooden structure over a lava rock foundation. The stones for this foundation may have come from Hipawai Heiau, which may have been destroyed around 1819 when Queen Ka'ahumanu broke the old *kapu*. As membership began to fail, the remaining congregation began to meet at a center on Mānoa Road instead. The old chapel was used as a baby clinic, a community center, and then as a theater. The theater proved popular, so the old building was razed and the Mānoa Valley Theater was completed in 1987. The church also has a small cemetery; the earliest grave can be dated to 1903 (Williams 1980:1).

### 4.5.2 Punahou School (Originally O'ahu College)

As previously noted, the Punahou lands once belonged to the High Chief Boki and his wife Liliha. They were given to Hiram Bingham in 1849 until Chief Boki's return. When Boki did not return, Bingham retained possession. He built a small adobe and thatch house on the property as early as 1831, where he worked on a Hawaiian translation of the bible. It was near this time that

many walls were built on the property, to keep out roaming cattle, and two large stones were placed along what is now known as Punahou Street. One of these stones is still at the main gate of the school. In 1837, the idea of a school to educate the children of the missionaries was proposed in a letter (Foster 1991:17-21). The original building for the school was built in 1841 (Figure 32), and the first fifteen students began to study in the structure in 1842.

### 4.5.3 Sacred Heart Church at Punahou

In 1823, Kamehameha II, his wife, and entourage sailed to London. With this party was a Frenchman, named Jean Rives, a close friend of the king, and his servant, a young Hawaiian boy named Kanui. After the king and queen died in London, Rives left the party and traveled to France where he visited the Sacred Hearts Fathers in Paris. Rives left Kanui at the church and urged the fathers to send missionaries to Hawai'i to convert the natives to Catholicism. The fathers sent three brothers in 1827, and Kanui, now known as Father Maigret, returned home in 1837.

There is some evidence that Kanui may have had a grass-thatched chapel somewhere in Mānoa Valley, but most of the converts probably traveled to the Catholic Mission on Fort Street in downtown Honolulu. Kanui died in 1842, and many of his converts may have reverted to the dominant Congregational Church. The American missionary Richard Armstrong visited the area in 1846 and noted:

. . . in the beautiful valley of Manoa, there is an encouraging state of things. Meetings are full and interesting and some 18 papists have returned to the "old paths." (Armstrong 1846)

In 1883, Father Clement Evrand decided to establish a permanent church in Mānoa, a wooden structure built on Wilder Avenue. In 1910, a new Gothic-styled stone church was planned on land on Wilder Avenue across from the Punahou campus. The Sacred Heart Church was completed on 1914, with stained glass windows shipped from France. In 1923, a parish hall was completed, on 1927 a parochial school was built, and in 1953 a new high school was built on Punahou School (Bouslog et al. 1994:32-33).

### 4.5.4 Wai'oli Tea Room of the Salvation Army

In 1909, the Salvation Army purchased 28 acres in Mānoa on lands in Ka'aipti once owned by Kauikaeouli, Kamehameha III. On this land the Salvation Army built a home to shelter and educate needy children. In 1922, they built the Wai'oli (meaning "happy water") Tea Room and a bakery, so that the girls could learn "cooking, baking, and the arts of gracious living." "High Tea" was served at Wai'oli and later luncheons. The tearoom rapidly became a focal point of the community. In 1929, a grass hut once occupied by the famed writer Robert Louis Stevenson during his visits to the islands (in 1889 and 1893) was moved from its original location at 'Āinahau, the Waikī home of Princess Kaiulani and her parents, to the Wai'oli Tea Room property (Bouslog et al. 1994:32).





Figure 32. 1866 Photograph of Punahou School, Photograph attributed to Charles Burgess (photograph from Foster 1991:32)

#### 4.5.5 Chinese Cemetery

The society called Lin Yee Chung was organized in 1851. The purpose was to buy burial land, to conduct Chinese funeral rites, and to arrange for the return bodies to China for final burial, if requested. In 1852, a group purchased the first lot of land in Mānoa from a Hawaiian called Moehonua. In 1854, they bought Land Grant #101, but disputes with the lot boundary delayed construction of the cemetery until 1896 (Figure 33).

In 1852, a man name Lum Ching, a practitioner of the astronomy/geology study called “kum yee hok”, or geomancy (the art of divination by means of lines and figures), visited Mānoa Valley. When he climbed Akaka Peak, his instruments (including an astronomy-based compass and a light-reflecting mirror), told him he was at an:

... extraordinary spot. It is the pulse of the watchful dragon of the valley. People from all directions will come from across the seas and gather here to pay homage. Birds, too, will come to sing and roost. It is a haven suitable for the living as well as the dead. The Chinese people must buy this area and keep it as sacred ground. (Thom 1985:5)



Figure 33. Entrance to Line Yee Chung Chinese Cemetery in Mānoa (photograph from Bouslog et al. 1994)

#### 4.5.6 Lyon Arboretum

In 1919, the Hawaiian Sugar Planters' Association (HSPA) purchased the 124-acre Haukulu 'Ili, which had once been owned by Charles Kana'ina, father of King William Lunalilo. It was later owned by Fred Harrison, who built a country home and stable. Dr. Harold L. Lyon was the plant pathologist for the HSPA and head of the Department of Botany and Forestation for the Territory of Hawai'i. He leased 325 adjoining acres of land from the Territory and the Bishop Estate to use as a reforestation area and as an experimental station for the growing of sugar cane varieties. The HSPA gave the 124-acre arboretum to the University of Hawai'i in 1953 for the purpose of research, education, and public service (Bouslog et al. 1994:200-201).

Near the Lyon Arboretum, above 'Aihualama Stream, is a cul-de-sac known as “The Pen,” which became famous during the overthrow of the Queen Lili'uokalani and the Hawaiian monarchy. In 1893, the Provisional Government was declared by several businessmen; and in 1894, they established the Republic of Hawai'i. Revolutionists who wished to restore the monarchy soon began to stockpile weapons. One of these was Robert W. Wilcox, a former member of the government. He and his associates planned to form an army large enough to overthrow the illegal government, capture 'Iolani Palace, and restore Lili'uokalani to her throne.

The new government found out that the Royalists had a cache of weapons at the house of H.F. Bertelmann at Waikiki Beach, and they sent a squad of government police to secure the weapons

and arrest the rebels. Some of the Royalists escaped to Diamond Head where they held out for several days, but finally running low on ammunition and food they retreated into Pālolo Valley, and then finally climbed through a pass into Mānoa Valley, ending at "The Pen." Many of the rebels surrendered, and others scattered towards Pauoa Valley and on to Honolulu. Eventually all of the rebels surrendered or were rounded up.

#### 4.6 Mō'ili'ili Quarry

A major feature of the lower campus is the quarry that was operated by the Honolulu Construction and Draying Company, Ltd. (HC & D; now Ameron HC & D). A quarry was established there as early as 1889 (Kobayashi 1983:169) to exploit the thick dense deposit of ephelinite-melilitite "blue rock" basalt. HC & D leased the Bishop Estate land from W. C. Cummings starting on June 1, 1910 and enlarged operations by buying out the neighboring Mō'ili'ili Quarry in 1914. Although Portuguese masons worked the rock into building blocks, curbing material and tombstones, most was used for road construction base course and general aggregate. Mō'ili'ili residents kept track of the time by the regularity of the blasting schedule. Quarry operations ended on November 15, 1949, but the crusher continued to process rock from a Pālolo Valley quarry until 1951, when Ameron HC & D moved operations to Kapa'a in Kailua. After extensive negotiation over price, a final order of condemnation for the approximately 95 acres of Bishop Estate land was finalized in 1953 and the University took over the area.

#### 4.7 Early Years of the University of Hawai'i at Mānoa

The University of Hawai'i at Mānoa developed out of the 1862 U.S. Federal Morrill Act funding for "land grant" colleges. In 1907, "an act to establish the College of Agriculture and Mechanic Arts of the Territory of Hawai'i" was passed by the Hawai'i's Territorial Legislature and was signed into law by governor George Carter on March 25th. The regents chose the present campus location in lower Mānoa on June 19, 1907. Regular classes began in September 1908 with ten students and thirteen faculty members at a temporary Young Street facility near Thomas Square. In 1911, the name of the school was changed to the "College of Hawai'i" and in the following year the college moved to the present Mānoa location.

The future campus was a relatively dry and scruffy place: "The early Mānoa campus was covered with a tangle of *kiawe* trees (*algarroba*), wild *lantana* and *pānini* cactus" (Kobayashi 1983:7). It appears the first structures built were a poultry shed and a dairy barn. The indications are clear that there were many stone walls and almost certainly other archaeological sites in the core area of the future campus:

The area that was to become the university farm (located on what is now the area east of Hawai'i Hall) was made up of small fields, from one-tenth to one-fourth of an acre, each surrounded by loose rock walls. Each area had been farmed by individual Chinese and Hawaiian tenants. All of the rock had to be removed. There was also much rock both on the ground and buried in the soil. It took ten years to clear 22 acres. The late Dr. Frederick Krauss estimated that 5,000 cubic yards of stone were removed from the stone walls alone...The rock was piled in an area just east of Hawai'i Hall and covered almost an acre, with rock piled five feet high. The rock was sold to builders and contractors for ten cents a wagon load. (Kobayashi 1983:7)

The reference to "5,000 cubic yards" sounds like a lot of archaeological sites! The accounts cited above indicate fairly intensive agricultural use of the area just east of (the present) Hawai'i Hall. Residential use is suggested in an account that: "On May 15, 1911, the Regents discussed what to do about seven groups of Hawaiian squatters, including one group that tilled the land, on the College's Puahia lot" (Kobayashi 1983:7). It appears that all seven groups were resident in the immediate vicinity of the campus but that only one group was involved in farming on campus. They were evidently evicted the same year.

An eyewitness account from Arthur L. Dean documenting conditions after June 1914 noted:

Immediately in front of [the present] Hawai'i Hall was a strip of lawn perhaps 75 feet wide. The wooden building moved up from Young Street, stained a dull brown, was the only other building on what is now the Campus. Dirt roads, which were impassable in wet weather, straggled through the grounds and disappeared among the trees and bushes in the direction of the farm. A neighboring dairyman paid a small monthly rate for the privilege of running his cows through the lands and they wandered about at all hours and places. (Kobayashi 1983:7)

Development of the campus was restricted by a lack of funding in the early years. An early donation of \$1,500 for Alexander and Baldwin in 1915 allowed the college:

To clear and grade a large area of wild campus land approximately bounded by what is now University Avenue, Campus Road [running east-west on the seaward side of Hawai'i Hall], the Campus Center Building, and the parking lots behind Sinclair Library, converting it into the first Cooke Field... (Kobayashi 1983:7)

That the grading of this relatively small area cost \$1500 1915 dollars suggests that, like the first portion of the campus to be cleared to the northeast, this area also included "much rock." While the first conceptions of a campus plan in 1909 were for major campus buildings to define an elongated east-west esplanade extending east from Hawai'i Hall, by 1915 the campus had started to take on a more ad-hoc style with the H-shaped Young Engineering Quadrangle starting to be developed to the southeast (four of the five structures remain, the southwestern one having been torn down for the building of the present Campus Center) (Figure 34).

The College of Hawai'i was started with a clear focus on studies in agriculture and engineering to address local needs. In 1920, with the formal establishment of the University of Hawai'i, the vision changed to a much broader curriculum reaching out to countries of Asia and the Pacific.

In 1922, the construction of the third permanent building on campus, Gartley Hall, began the "old quad" that was subsequently expanded by construction of George Hall in 1925 and Dean Hall in 1929. The old gymnasium was built in 1928/29 (just northwest of the present Bachman Hall) and remained until 1959 when it was razed following the construction of Klum Gym. The depression years significantly slowed development. In 1930, the Normal School (today's "West



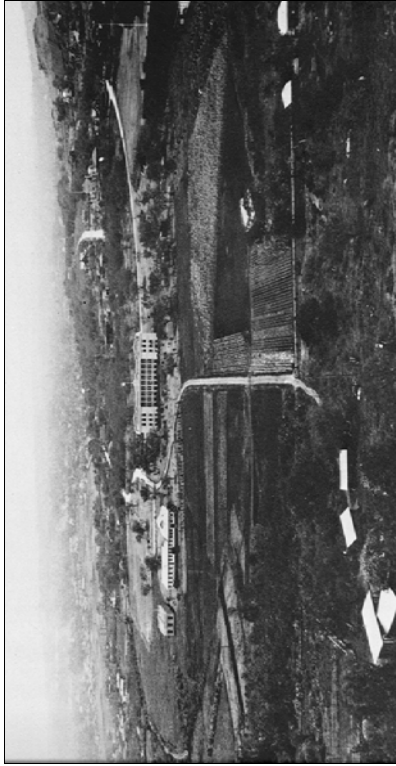


Figure 34 View of the campus in 1917 from Wa'ahila Ridge (Adapted from Kobayashi 1983:23) showing the two permanent buildings, Hawaii Hall (1912) is at center, the beginnings of the Young Engineering quad (still 4/5 intact by the present Campus Center) is at left of the relocated wooden building moved up from Young Street

Hall") was opened on the west side of present University Avenue. In 1931, with the merging of the Normal School with the University's School of Education (forming what was then Teachers College and what is now the College of Education), this western land became part of the University campus. The 1930s were also the time of the construction of many of the campus' most iconic structures, including Founders Gate (1933), Varney Circle Fountain (1934), Andrews Outdoor Theater (1935), George Hall (1936), Crawford Hall and Hemenway Hall (both 1938), and Miller Hall (1939) (Figures 35 through 38).

WWII brought such impacts to campus life as Hawai'i Hall becoming the U.S. Armed Forces Institute and the construction of fourteen wooden barracks up near the present Spaulding Hall. The army took over the gym, soldiers ate at the Hemingway Hall cafeteria, and bomb shelters were built. A portion of the campus was designated as a temporary military cemetery but fortunately no graves were ever dug (Kobayashi 1983:80).

The Bachman Hall administration building, designed by Honolulu architect Vladimir Ossipoff, and built in 1949, was the first permanent post-war building. A construction boom has been on-going more or less continuously ever since. The core area of the campus was expanded in 1968, when approximately 30 acres were obtained near the Mānoa Library and Mānoa Marketplace; this land was developed in 1975 for the present Astronomy Institute at 2680 Woodlawn Drive.

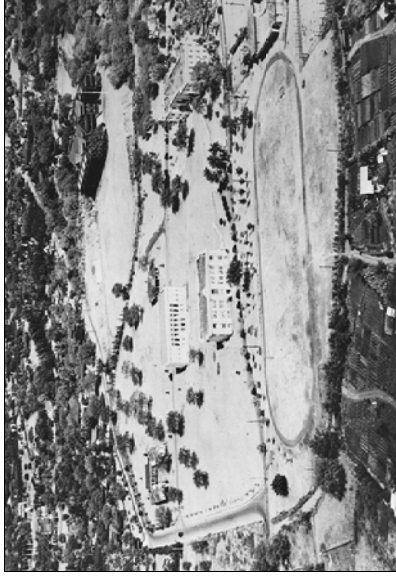


Figure 35. 1926 aerial photograph showing seaward end of present University Avenue ending at Metcalf St. (extreme left), George Hall (1925) inland of Gartley Hall (1922; center), with Hawai'i Hall (1912) at right and the Cooke Field Track (vicinity of present Sinclair Library) in the fore. The future Bachman Hall area is still in farm plots.



Figure 36. 1929 aerial photograph showing the western half of the present campus still in fields but University Avenue has now been extended seaward (extreme left, middle) and there has been significant clearing seaward of the Cooke Field track associated with construction of the original Gym (1928) just NW of the present Bachman Hall.



Figure 37. 1939 aerial photograph showing the campus dominated by the old quad (lower right) of Hawai'i (1912), Gartley (1922) George (1925) and Dean (1929) and the new Crawford Hall (1938). The brand new Hemenway Hall (1939) is just seaward and old Gilmore Hall (1935-1973) with its two wings anchors the east end of campus at left

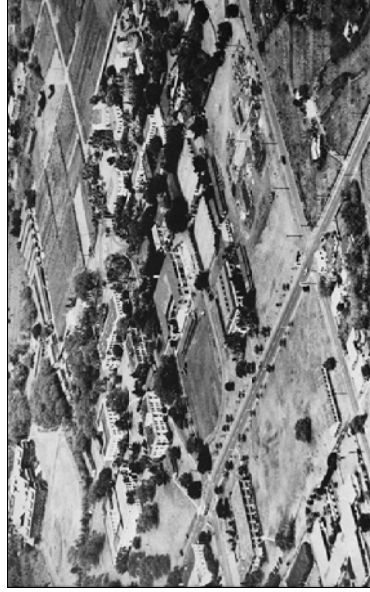


Figure 38. In 1949 aerial photograph the campus is dominated by the central Hemenway Hall (1938), the old Gym and the on-going construction for Bachman Hall are near University and Dole streets, the University Farms still dominate the eastern campus

## Section 5 Archaeological Research

### 5.1 Overview

In general, the vast majority of archaeological sites once located in the Mānoa Valley have been destroyed by modern development, including the construction of the university campus in the lower valley and residential / commercial centers elsewhere. The campus is located in what would have been the prime wet taro-growing area of the entire valley, and many *lo'i* (stone terraces) and *auwai* (irrigation ditches) were located here; this agricultural heartland of the valley (i.e., the present-day campus) also would have been home to many small stone enclosures, terraces and platforms used by *maka' inana* (commoners) as house sites. The valley also was home to numerous *heiau*, some of which have been preserved into modern times, and burials (see below).

### 5.2 Heiau of Mānoa

The first recording of information regarding archaeological sites of Mānoa was by Thomas G. Thrum in his informal study of Hawaiian *heiau*. It was presented in a number of short articles in his *Hawaiian Annual* between 1892 and 1909. Thrum (1907a, b) briefly described five *heiau* in Mānoa. In the early 1930s, McAllister (1933) reprinted this information in his *Archaeology of O'ahu*. McAllister could relocate only one of these *heiau*, Kūkaō'ō Heiau, which he mapped and described in more detail.

Emma Nakuina (1907:24) also describes a *heiau*, named Kaua'ā'a, and a sub-*heiau*, named Kauwalomālie, on the site of the Mid-Pacific Institute near Wailele Spring (possibly in the *'ili* of Kauwala'a). These *heiau* were not listed by Thrum in his report on O'ahu *heiau*, but may be mentioned in a different article by Thrum (1892:112), which lists forts built by the high *ali'i* Kuali'i, who built "a system of heiaus, extending from Mauoki, Puahia-luna and lalo, Kumuohia, Kaua'ā'a, Wailele, and one or two other points between Kaua'ā'a and Kūkaō'ō."

The possible locations of these six *heiau*, and place names associated with them mentioned in their descriptions, are shown in Figure 39. This figure is a modern O'ahu street map, with an overlay of the outline of the 1822 E.D. Baldwin map of Mānoa Valley (see Figure 8). The overlay was created by lining up several major peaks (Round Top, Makani, and Wa'ahila) plotted on both maps; however, since this is a comparison of one map created in the nineteenth century and a more exact map created in the twentieth century, the correlation between the two maps may not be exact.

#### 5.2.1 Kūkaō'ō Heiau

According to legend, six *heiau* on the island of O'ahu were built by the *menehune*, but only one, Kūkaō'ō Heiau, was built for their own use (Luomala 1951:20). The *menehune* were said to have built a fort and a temple at Kūkaō'ō, a place above (inland of) the hill called Pu'u Pueo (Westervelt 1963a:131). They were driven away from their fort by the high chief Kuali'i during his reign (sometime in the 1700s). Kuali'i rebuilt it after his seizure of the fort.

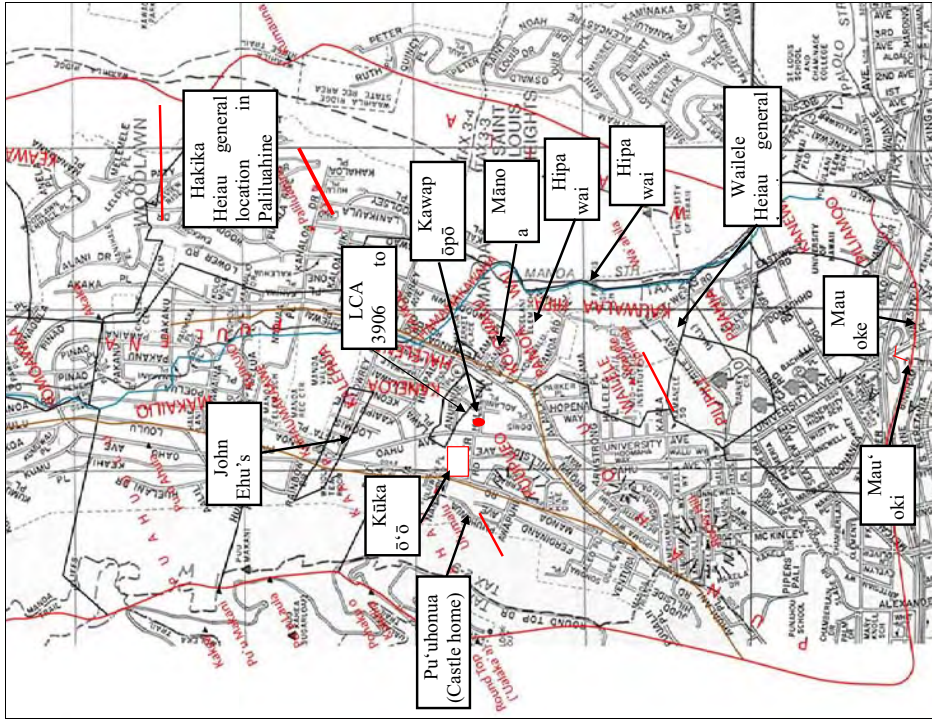


Figure 39. Overlay of 1822 E.D. Baldwin map of Mānoa Valley on modern street map, showing possible *heiau* locations

In 1892, Thrum described this still-standing *heiau* of Kūkaō'ō on the hill called 'Ulumalu:

A few hundred feet from the house, on a vast rock pile, still stands a walled enclosure known as the heiau of Kūkāo, now overgrown with lantana and night blooming cereus. This old heathen temple dates back many hundred years. Its erection is credited to the Menehune's—or class of pigmies—but was rebuilt during the reign of Kualii [circa A.D. 1700s], who wrested it from them after a hard fought battle. The Menehune's fort was on the rock hill, Ulumalu, on the opposite side of the road, just above Kūkāo. Previous to the battle, they had control of all upper Mānoa. (Thrum 1892:112)

McAllister located Kūkaō'ō Heiau during his inventory of O'ahu in the early 1930s. He described it as a "small heiau 50 by 40 feet," built on a natural elevation about 30 feet high. "There remain[s] a small inclosure and two terraces to the west" (McAllister 1933:79). He located the *heiau* on the premises of the residence of C. M. Cooke, Jr.

This *heiau*, which is still standing and located at 2859 Mānoa Road, has been recorded during several subsequent archaeological surveys (Kennedy 1991; Cleghorn and Anderson 1992; Tomonari-Tuggle 1998). Various portions of the *heiau* have been recorded in TMK 1-2-019: 035, 036, and 043, in a large area between Mānoa and O'ahu Roads and *mauka* of Cooper Road. In addition, a burial has also been recorded from 2859 Mānoa Road (Jourdan 1994).

Although there is no confusion over the present-day location of the *heiau*, there is some disagreement regarding the number of structures, the name of the surrounding area, and the name of the hill on which the *heiau* and/or fort was built. In Thrum's 1892 account of Mānoa Valley, he described Mānoa Road as if he was traveling from the *maikai* boundary to the upper valley. He states that Kūkaō'ō Heiau was built on a rock pile, and the *menehune* fort was built "on the opposite side of the road on the rock hill, Ulumalu, just above Kūkāo." This suggests there were actually two structures on 'Ulumalu hill: a *heiau* on the east side of Mānoa Road and a *menehune* fort on the west side of Mānoa Road.

In the legend of Pūo Ali'i, the king of the owls, Westervelt states that Pūo Ali'i "was thought to be a chief leading his army along the hillside below Pu'uhonua Temple." In a footnote on the same page of his book, he states "This place is now the site of the Castle home" (Westervelt 1963a:131). William and George Castle built a large mansion in Mānoa in 1898 for their ailing mother Mary Tenney Castle, the widow of Samuel Northup Castle, one of the group of the eighth missionary party to Hawai'i. They called the house Pu'uhonua, which means "place of refuge." It was built in a land area called Kautumalu (Ka 'Ulumalu) on a hill called 'Ulumalu, at the place that would later be the end of Ferdinand Street. George Castle remembered that near the house was a "sacificial stone and some ruins of the *heiau* to Kū'ula and above on the hillside the Pōhaku Kū'ula, a rock on which the watchman stood to command a view of the entire valley from mountain to sea" (Bouslog et al. 1994:88).

A hill labeled "Ulumalu" was plotted on the 1882 Baldwin map of Mānoa Valley on the west side of Mānoa Road. This map also shows that the hill was part of Grant 4166 to Mrs. Mary Castle. A *p. haka* called Pōhaku o Kūkaia is also plotted on the 1882 Baldwin map of Mānoa Valley (see Figure 8) just *mauka* (northwest) of the hill labeled 'Ulumalu. This may be the "sacificial stone" that George Castle called Pōhaku Kū'ula. The question remains if there was a fort also on 'Ulumalu hill, or if the *heiau* ruins Castle is referring to is actually Kūkaō'ō Heiau, on the east side of Mānoa Road. As mentioned previously, Westervelt refers to a structure called

Pu'uhonua Temple at the Castle residence. However, the presence of such a "temple" at the Castle residence would be inconsistent with George Castle's reminiscences, since he refers to a sacrificial *heiau* dedicated to the war god Kū, not a *heiau* dedicated to "refuge."

Joseph Kennedy (1991) concluded that there was only one structure, that acted as both a *heiau* and fort, and that it was located on the east side of Mānoa Road (location of Kūkaō'ō Heiau). He believed that the surrounding area was called Kūkaō'ō and the hill that the *heiau* was built on was called 'Ulumalu (east side of Mānoa Road). The resolution to at least some of this confusion may have been addressed in a 1982 article on the Castle home. In this article, the author states that the location for the house was chosen in 1898 on the western side of the valley.

This is the *alii* (or noble's) side of Mānoa, rich in legend and folklore, known to Hawaiians as Kaulumalu (Breadfruit shade). . . . One of the Castle sons, George (1851-1932) recalled "there being a beautiful grove of breadfruit and ohia trees where native birds congregated in great numbers." The man who planted the grove was very old and I was a boy. Sand [volcanic cinders] came down . . . and choked the trees. . . .

Another son, William (1849-1935), gave the name Puuhonua to the property. *Pu'u*—hill or protuberance, and *honua*—of earth, but also meaning a place set apart for refuge and safety. . . .

The 8.16 acres had been purchased at auction on May 12, 1898, for \$6,250. A government survey station on the site had already been given a name from the past, *Ulumalu*. (Robb and Vickers 1992:173-174)

These passages suggest that the specific association of the place name 'Ulumalu with the hill on which the Castle home (west of Mānoa Road) was built may only date from the late nineteenth century; therefore, a hill on the east side of Mānoa road may well be the original (older) Pu'u 'Ulumalu. It seems to have been a mistake for Westervelt to call the Castle home "Pu'uhonua Temple" or to associate it with Kūkaō'ō Heiau, which was a sacrificial *heiau* dedicated to the war god Kū, and not a "place of refuge." The name Pu'uhonua was probably given to the house to represent that the place was a refuge for the Castle family (Stokes 1941:2). McAllister (1933:79) also showed some skepticism to the Westervelt reference for Pu'uhonua Temple stating, "I doubt that this was a heiau."

The *heiau* is also mentioned in Land Commission records as "LCA 3906 to K. Neki. *Heiau* of Kūkaō'ō, fence; house in" (see Table 1). On the 1882 Baldwin map, there is a property labeled "Gr. 638 Haalilio, see LCA 3906 W Neki." Land Commission documents reveal the following information regarding this award:

No. 3906, Neki, Honolulu, January 17, 1848

N.R. 187-188/4

To the Land Commissioners, Greetings and thanks: I, Neki hereby state my claims /at/ the land fence, mauka in Manoa, at the heiau of Kukaao on the side below the heiau.

These two fences of which I tell you were from my makuas - they expended a great deal of revenue in making these fences, and I also did, and they are mine at this time - no one else has a right to them. That is my explanation to you.

I am, with thanks.

NEKI

To the Land Commissioners - House lot, also. Greetings to you and thanks: I, Neki, hereby state my claim for a house lot which is mauka in Manoa in the Land of Kaloiki. I have two house lots at this time. That is my explanation to you.

Aloha,

NEKI

N.T. 378v10

No. 3906, Neki (from page 306), 1 September 1854

Maki, sworn, I have seen his claim in Kaloiki in Manoa of two lots with enclosures and in one piece.

Mauka, Mahune's land

Waialae, Kaahaloa, Kalamikahua's land

Makai, T. Tute's land

Ewa, Mr. Marshall's land.

This land was given to Neki by J. Haalilio when Kaahumahu was yet alive before 1832. No objections.

Kahanaumakai, sworn, I have seen this place since 1842 to the present time. I have done farming under Neki and that place is for Neki. Mahi's statements above are true.

Kana, sworn, I have known in the same way as they have stated since 1845 to the present time.

[Award 3906; R.P. 6502; Kolowalu Manoa Kona, 1 ap.; 7.25 Acs]

On the overlay map (see Figure 39), this LCA seems to be in the general location over Anuenue Street rather than between Mānoa and O'ahu Roads (where Kūkaō'ō Heiau is standing). From the description, Neki says that his lot is "on the side below the heiau," so it is possible that the *heiau* was not in this actual lot; rather the lot was *makai* of the *heiau*.

### 5.2.2 Kawapōpō Heiau

Upper Manoa, on premises formerly of Haalilio; a small *heiau* said to have been torn down prior to 1850 (Thrum 1907a:45).

McAllister (1933:80) could not relocate this *heiau*.

In 1975, Margaret Luscomb (1975) conducted an inspection of the Maretzki property on 2626 Anuenue Street. This property was a portion of Grant 638 to Hana Haalilio and K. Neki (LCA 3906), Royal Patent 6502, signed by Lunaliilo. The Native Testimony for this award was presented above in the discussion of Kūkaō'ō Heiau. Luscomb recorded a raised platform, 7 by

6.5 m on the property. Since this structure was on Ha'alilio's land, Luscomb concluded that this platform might be Kawapōpō Heiau. In the description of his land, Neki says it was below Kūkaō'ō Heiau; there is no mention of the name Kawapōpō or of a second *heiau*.

One problem with assigning this structure as Kawapōpō Heiau is that Ha'alilio was granted other lands in Mānoa, before the *M' hiele*, and the location given by Thrum may refer to these other lands. Thrum described the location of some of these lands as *mauka* of John Ehu's homestead:

The site of the various houses that once sheltered Haalilio and his retinue is pointed out just above the old Ehu homestead, known later as the 'Charley Long' premises and, till very recently, part and parcel of Montana's Kaiapu Diary. Rev. H. Bingham, of early Hawaiian Mission fame, is also referred to by old timers as having had a residence adjoining the Haalilio premises, though his history makes no mention thereof. (Thrum 1892:114)

On the 1882 Baldwin map, two properties (Grants 15 and 54) are shown in the *'ili* of Ka'aiapu awarded to John Ehu (see Figure 39). If Thrum is referring to land owned by Ha'alilio that is above John Ehu's homestead, Kawapōpō Heiau may have been located much farther *mauka* of the structure recorded by Luscomb in LCA 3906 to Neki. This would suggest that the structure recorded by Luscomb may be part of Kūkaō'ō Heiau instead. Because of Thrum's imprecise location and the fact that McAllister could not relocate Kawapōpō Heiau, it is impossible at this time to determine whether Luscomb correctly identified the structure on the Metzinger property as Kawapōpō Heiau.

### 5.2.4 Hakika Heiau

Paliuhine, east side of valley.-A round heiau of not large size. Foundations now barely traceable. (Thrum 1907a:45)

McAllister (1933:80) could not relocate this *heiau*, but according to Thrum's description, it was on the east side of the valley, in the area called Paliuhine (near the modern-day suburb of Woodlawn). On the 1882 Baldwin map (see Figure 39), there is a peak labeled Paliuhine; therefore, the *heiau* was probably in this general location, but the specific location is not known.

### 5.2.4 Hipawai Heiau

Thrum described Hipawai Heiau as:

Makai of Church, Manoa.-Of large size and pookanaka class, partly destroyed many years ago, then used as a place of burial. Remaining walls subsequently torn down. (Thrum 1907a: 45)

This *heiau* was possibly described in 1823 by Levi Chamberlain, when he and other missionaries came to inspect a lot of three acres given to them by the Hawaiian government. The official report of the Sandwich Island Mission described the structure as:

On one side of this secluded valley they visited an old *heiau* or place of worship of Kamehameha's time, consisting now simply of a stone wall enclosing a small area about 20 feet square. (cited in Bouslog et al. 1994:12)

In his own journal for June 6<sup>th</sup>, 1823, Levi Chamberlain described in more detail "the ruins of a moreai [heiau]" as:

It was a regular wall built of loose stones about twenty four feet square from three to four feet high on the inside & from two and an [sic] half to three feet in thickness. On the north the outer side of the wall was much higher owing to a declivity at the foot of which were a few *kou* trees. The tall grass within and around was evidence that it is a long time since it had been frequented for the purpose of superstitious ceremonies. It is probably fifty years since it was erected. (cited in Bouslog et al. 1994:11-12)

The Mānoa Church was built in 1846 as an ' *puna* (branch) of the Kawaihāo'o Church. A newspaper article says that Hipawai Heiau was torn down in 1819 and some of the stones were used to build the rock foundation of the Mānoa Congregational Church, a building that replaced the Mānoa Church in 1935. Some stones may also have been used in the Mānoa Hawaiian Cemetery. A new church was built in 1968 on nearby Huapala Street, and the old building, on 2833 E. Mānoa Road, was used to house the Mānoa Valley Theater (Williams 1980:1). Hipawai is also the name of a cave.

There is a large underground cavern with much of the water of Manoa passing through it under the area of Woodlawn Drive where the new (1975) astronomy building of the University is. People went down into the cavern in former times. (Mary Pūku'i, cited in Sterling and Summers 1978:287)

The former location of the 1846 Mānoa Church is plotted on the 1882 Baldwin map (see Figure 39). The present day location of the astronomy building of the University of Hawai'i, and thus the possible location of Hipawai Cave, is shown on the base map of the same figure.

Hipawai Heiau was reported as *makai* of Mānoa Church. In 1968, Francis Ching recorded a rock mound, two to three feet high, 30-40 feet long, and 18 feet wide, with some remaining facing on the *makai* side. A platform was also present on the *makai* side. This *heiau* was located on the Māgoon property on land donated to the University of Hawai'i. Ching identified this structure as a possible *heiau*, but did not suggest a name for the structure. Ching also stated "I was also told that there was another site similar to the one discovered a little further *makai*" (Ching 1968:1).

In 1988, a field check was conducted at the St. Francis High School campus (TMK 1-2-9-04-01), which is *makai* and adjacent to the northeastern corner of the campus (Kawachi 1988a). Carol Kawachi recorded several walls and terraces in this area, but the place was heavily vegetated. An inventory of the features was not made, and no map was drawn. Kawachi also reported on a 1908-1909 military map that showed a *heiau* in the general area. She then suggested that this *heiau* could be the same as the one recorded by Ching on the Māgoon property, but since Ching did not give the TMK of the parcel he investigated, it was difficult to determine the exact location of this structure. According to a Land Court Map of 1926, Māgoon once owned property in several locations, including upstream of the St. Francis campus.

The exact 1908-1909 military map referred to by Kawachi could not be determined, but a 1908-1913 Corps of Engineers map (Figure 40) does show an L-shaped structure *mauka* and upstream of the St. Francis campus. This map was made before the construction of the high school, which was founded in 1924 by the Franciscan Sisters of the Third Order. Although this



structure is not labeled as a *heiau*, it may be the structure recorded by Ching, and may be Hipawai Heiau. A further confirmation of this attribution can be found on the 1822 Baldwin map (see Figure 39); the area where this L-shaped structure would be on this map (*mauka* of St. Francis High School) is in the *'ili* named Hipawai (literally, water foolishness). In fact, the street just *mauka* of the high school is called Hipawai Place, which was “named for an O’ahu land section” (Budnick 1989:43).

### 5.2.5 Mau'oki Heiau (Kamā'ili'i-ili Heiau)

Mau'oki was a *heiau* of the *po'okanaka* type (large *heiau* for the paramount chief of the district or island), as discussed by Samuel Kamakau:

There were many heiaus and *luakini* heiaus in Honolulu in the ancient days. . . . Of *heiau po'okanaka* there were Pakaka and Kaheiki in Honolulu, and Mau'oki, Kupalaha and Le'ahi [Papa'ema'ema] at Waikiki. Mau'oki was a *luakini heiau* built by the Menehune, a numerous race of men often spoken of in the traditions of *ka po'e kahiko*. Kahaniuailewa [Kahano-a-Newa] is said to have brought them here; his arms were the bridge. Mau'oki was made of stone from Kawiwi in Wai'anae, and there were so many Menehene that each brought one stone, and Mau'oki was completed. *Ka po'e kahiko* called these people Menehene; it is said the came from the east. (Kamakau, *Ka N pepa K'oko'a* March 3, 1870; translation in Kamakau 1991c:144)

The association of the *heiau* with the high chiefs in O'ahu is illustrated in the story of the birth of Kiha-a-Pi'ilani. Lā'ie-lohehoe was an *ali'i* born at Helumoa and raised at Kaluaokau in Waikiki. She was betrothed to Pi'ilani, the son of the *mā'ohi* (island-wide chief) of Maui and moved to his Pi'ilani's father's residence at Lāhainā in Maui for her wedding. They had four children; for the birth of her fourth child, a son, she returned to O'ahu. Samuel Kamakau reported that Kiha-a-Pi'ilani, the son of Lā'ie-lohehoe and Pi'ilani of Maui, was taken to Mau'oki Heiau after his birth at 'Āpuakēhau in Waikīkī.

No Kihapilani. Ua laweia oai e ke kahuna e hanai i ka moku. O Mauoki hoi ka heiau i ku i ka moku ma ka olelo a ke kahuna. Ua hanai ia oia a nui, a ua ao ia i ke koa me na oihana, kakaolelo, me ke akamai hoi i ka oihana hana. (Kamakau, *Ka Nipepa Kū'oko'a*, August 26, 1865)

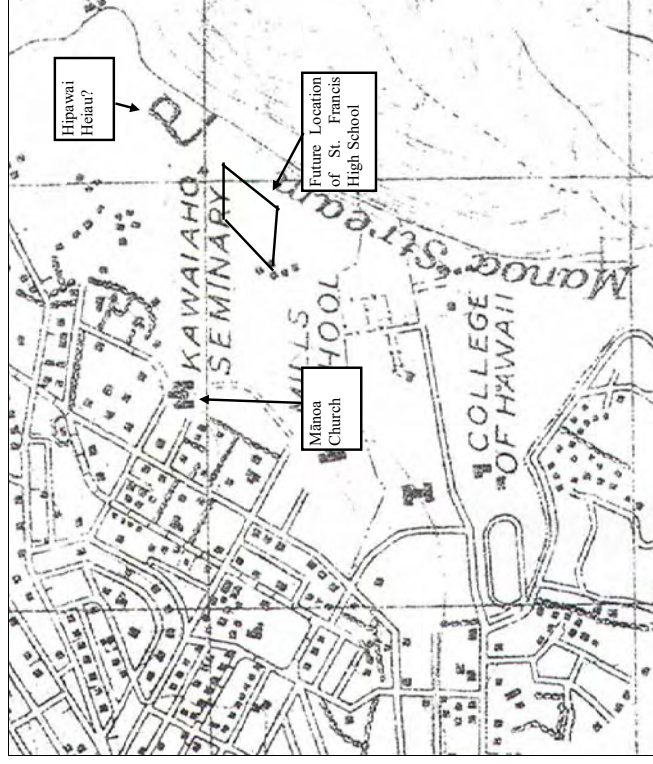


Figure 40. 1908-1913 Corps of Engineers Fire Control map, showing L-shaped structure, possibly Hipawai Heiau, on land later *mauka* of the St. Francis High School Campus

structure is not labeled as a *heiau*, it may be the structure recorded by Ching, and may be Hipawai Heiau. A further confirmation of this attribution can be found on the 1822 Baldwin map (see Figure 39); the area where this L-shaped structure would be on this map (*mauka* of St. Francis High School) is in the *'ili* named Hipawai (literally, water foolishness). In fact, the street just *mauka* of the high school is called Hipawai Place, which was “named for an O’ahu land section” (Budnick 1989:43).

### 5.2.5 Mau'oki Heiau (Kamā'ili'i-ili Heiau)

Mau'oki was a *heiau* of the *po'okanaka* type (large *heiau* for the paramount chief of the district or island), as discussed by Samuel Kamakau:

There were many heiaus and *luakini* heiaus in Honolulu in the ancient days. . . . Of *heiau po'okanaka* there were Pakaka and Kaheiki in Honolulu, and Mau'oki, Kupalaha and Le'ahi [Papa'ema'ema] at Waikiki. Mau'oki was a *luakini heiau* built by the Menehune, a numerous race of men often spoken of in the traditions of *ka po'e kahiko*. Kahaniuailewa [Kahano-a-Newa] is said to have brought them here; his arms were the bridge. Mau'oki was made of stone from Kawiwi in Wai'anae, and there were so many Menehene that each brought one stone, and Mau'oki was completed. *Ka po'e kahiko* called these people Menehene; it is said the came from the east. (Kamakau, *Ka N pepa K'oko'a* March 3, 1870; translation in Kamakau 1991c:144)

The association of the *heiau* with the high chiefs in O'ahu is illustrated in the story of the birth of Kiha-a-Pi'ilani. Lā'ie-lohehoe was an *ali'i* born at Helumoa and raised at Kaluaokau in Waikiki. She was betrothed to Pi'ilani, the son of the *mā'ohi* (island-wide chief) of Maui and moved to his Pi'ilani's father's residence at Lāhainā in Maui for her wedding. They had four children; for the birth of her fourth child, a son, she returned to O'ahu. Samuel Kamakau reported that Kiha-a-Pi'ilani, the son of Lā'ie-lohehoe and Pi'ilani of Maui, was taken to Mau'oki Heiau after his birth at 'Āpuakēhau in Waikīkī.

No Kihapilani. Ua laweia oai e ke kahuna e hanai i ka moku. O Mauoki hoi ka heiau i ku i ka moku ma ka olelo a ke kahuna. Ua hanai ia oia a nui, a ua ao ia i ke koa me na oihana, kakaolelo, me ke akamai hoi i ka oihana hana. (Kamakau, *Ka Nipepa Kū'oko'a*, August 26, 1865)

Figure 40. 1908-1913 Corps of Engineers Fire Control map, showing L-shaped structure, possibly Hipawai Heiau, on land later *mauka* of the St. Francis High School Campus

Kīha-a-Pi'ilani was taken by the *kahuna* and raised at the *heiau* of Mau'oki at Kamō'i'i'i'i [Mō'i'i'i'i]. He was raised there until he was grown and taught to be a warrior and an orator; he was skilled in those professions. (Kamakau 1991c: 50)

The *heiau* was described by Thrum (1907a:44) as:

It is said to have been of traditional Menehune construction with stones brought one by one from Kawiwi, Wāianae. It was a heiau of good size, walled on three sides and open to the west that stood at the foot of the slope dividing the Mānoa and Palolo valleys, Kamoiilii.

Thrum also referred to this *heiau* as the Kamō'i'i'i'i Heiau.

Kamoiilii. Heiau and luakini [sacificial heiau]; erected according to tradition by Menehunes with stones from Kawiwi Wāianae. Torn down about 1883 by the Minister of Interior for street work. (Thrum 1907a:44)

According to Thrum, the *heiau* was in Mō'i'i'i'i, at the border of the *ahupua'a* of Mānoa and Pālolo. According to C. S. Stewart (Sterling and Summers 1978:279), Mau'oki Heiau was located possibly at the junction of Wai'alaie Avenue and Third Street, which would place the *heiau* just south of Chaminade University in the *ahupua'a* of Pālolo. McAllister also located the *heiau* (Site 62) in Pālolo Ahupua'a, just *mauka* of Site 61, the Mō'i'i'i'i petroglyphs.

Dr. Richard Bordner, who was familiar with the Chaminade University area, said he believed a large agricultural *heiau* was once just north of an area of petroglyphs along Pālolo Stream. This *heiau* was on a relatively flat area on the west edge of Pālolo Stream near where there is presently a 22-caliber rifle range. Dr. Bordner's account of the relationship of these petroglyphs and a *heiau* are consistent with McAllister's (1933:57) description of Mau'oki Heiau (McAllister's Site 62), which was just *mauka* or north of the Mō'i'i'i'i petroglyphs (McAllister's Site 61). According to Dr. Bordner, until relatively recently, there were still some large boulders in the immediate vicinity that may be remnants of this *heiau* (Hammatt et al. 2002b: 23). A search for this *heiau* was made during the recent Ala Wai Watershed survey, but no *heiau* or cluster of boulders was found. In a recent conversation with Dr. Bordner, he stated that he believed that the remains of the *heiau*, and the petroglyphs, have been destroyed.

All of these reports have placed Mau'oki Heiau within the current boundaries of Pālolo Ahupua'a, near Chaminade University. McAllister (1933) located the *heiau* just north of the petroglyphs, which seem to be definitely near Pālolo Stream; however, McAllister never personally saw the *heiau*, since it had been destroyed in 1883.

On an 1883 survey map (Figure 41) by S. E. Bishop (traced by E. Kealoha in 1958), a structure labeled "heiau" is shown near a feature labeled "Mauoke Spring," both of which are *mauka* of "Moilili Road" and King Street (along the present day alignment of Wai'alaie Avenue) in the 'ili of Pa'āka. In a comparison of this map with the 1882 S.E. Bishop map of Mānoa Valley (see Figure 8), this location is south of the 'ili of Pīlīpīlī and west of the 'ili of Kāneawai (the present day athletic field for the University of Hawai'i at Mānoa). If the pictured *heiau* is Mau'oki Heiau (as suggested by its proximity to "Mauoke Spring"), then Mau'oki Heiau was actually once located much farther west than Chaminade University, near the *makai* border of Pālolo Ahupua'a (south of the University of Hawai'i) rather than near the *makai* border of Pālolo Ahupua'a (south of Chaminade University).

This location seems to be near the Mō'i'i'i'i Quarry, but the correlation of the 1882 map and the modern map is probably not exact. This also means that the agricultural *heiau* noted by Dr. Bordner near the Mō'i'i'i'i petroglyphs may be a different *heiau* than the *luakini* (sacificial) *heiau* of Mau'oki. It is also possible that Mauoke spring was another name for Kumulāe Spring, an ancient legendary pool that is associated with the extensive karst caves of Mō'i'i'i'i.

### 5.3 Early Archaeological Surveys of Mānoa Valley

In J. Gilbert McAllister's island wide archaeological survey (1933), he recorded five sites in the vicinity of Mānoa including Site 61 petroglyphs, Mō'i'i'i'i, Site 62 Mau'oki Heiau, Site 63 Hipawai Heiau, Site 64 Kūkaō'ō Heiau, and Site 65, which seems to refer to the whole valley (Figure 42).

Under McAllister's Site 65, "Mānoa Valley," he discusses "Pu'uhonua Heiau," the sweet potato fields of Pu'u Lālaka'a, Thrum's sacred stone, a cave on the east side of Mānoa Valley, which Westervelt (1904:2) associates with Kamehameha the Great, and the Kawapōpō and Hakika Heiau. Little new information is presented regarding the other sites.

Until 1900, Punahou School had a small collection of Hawaiian artifacts in a glass cabinet in the Old School Hall. Some of these artifacts are shown in a circa 1900 photograph (Figure 43). In the foreground of the photograph is a carved wooden figure that may be the wooden figure found by Punahou students on Rocky Hill. Foster says this was found "on Rocky Hill" (Foster 1991:35) in one section and "in a cave on Rocky Hill, a vestige of the *heiau* that once stood in that area" (Foster 1991:128).

Samuel Armstrong mentions exploring its caves for wooden idols and ghosts, and Thomas Gullick tells in detail how the boys, climbing the slope, once came upon a cavern between the cliffs and, by excavating, penetrated to a point where they required torches to see their way. There they discovered a little idol. It must have come from the small *heiau* that once stood on Rocky Hill. Probably it and a large wooden idol brought to Punahou from a taro patch at Waialua had both been hidden at the time the edict had gone forth to destroy all the idols [Alexander and Dodge 1941:122].

Other early site designations in Mānoa included the Bishop Museum's designation of the former home of Queen Ka'ahumanu, "Pukaomaomao," in upper Mānoa as Site 405 and the designation of a complex of agricultural terraces in extreme northern Mānoa Valley (State Site #50-80-14-3953).

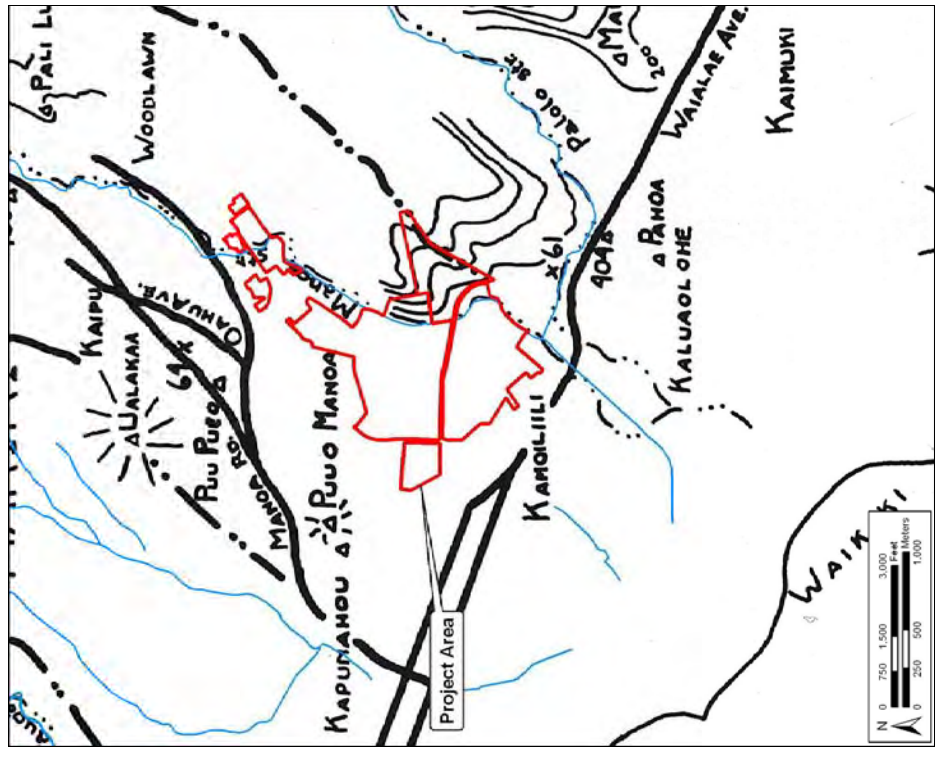


Figure 42. Project area (in red) in relationship to archaeological sites identified in Sites of O'ahu (Sterling and Summers 1978)

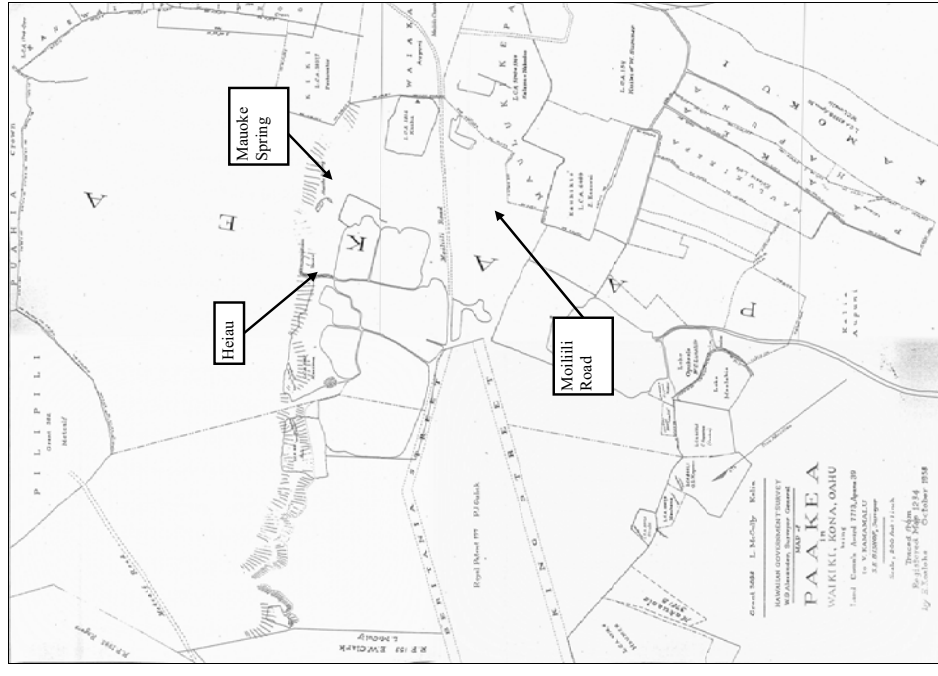


Figure 41. 1883 S.E. Bishop map of Pa'ākea, showing location of a *heiau* near Mauoke Spring



Figure 43. Circa 1900 photograph of artifacts displayed at Punahou College including the wooden idol (left foreground) possibly found in a cavern in Rocky Hill

#### 5.4 Post 1960 Surveys of Mānoa Valley

Between 1963 and 1990 there were at least thirteen other archaeological studies in the Mānoa area, which are summarized in Table 2 and plotted in Figures 44 and 45. Of particular interest is the recovery of a total of 25 presumed prehistoric burials from six other areas (Sites 3743, 4038, 4134, 4191, 4266 and the Koana Cave Site). The oldest report of burials in the Mānoa area of which we are aware concerns the discovery of human bones in a cave site located approximately 50 m *mauka* of the Dole Street burial site (4266). This cave is almost certainly the “cave called Koana” on a 1916 Podmore map (Figure 46). A neighboring resident informed us that she had taken human skeletal remains discovered in the cave to the B.P. Bishop Museum (she thought it was in 1953), and that subsequently archaeologists from the Museum had visited the cave and indicated that they felt the site had little potential. The Bishop Museum has no record of such a visit; however, they have an accession of an adult female crania (osteological catalogue #2863) dated 7/10/1964 from St. Louis Heights, O’ahu giving a person with the same last name (different first initial) as the source. Typically a Museum archaeologist would have investigated such a discovery. A habitation or burial function of the cave is suggested by one possible translation of *ko ana* – “to stay or settle in one place, as people” (Pūku’i and Elbert 1986:157).

The five burial sites (3743, 4038, 4134, 4191 and 4266) were all interpreted as “prehistoric or early historic” (Bath and Smith 1988; Bath and Kawachi 1989; Bath and Kawachi 1990; Hammatt and Shideler 1991; Smith and Kawachi 1989). With one exception (the Dole Street burials), there were no associated cultural materials with any of these remains, nor was there any chronological dating. The Dole Street burials were associated with three formal artifacts of traditional design and with cultural layers dated to the fifteenth century A.D. (Hammatt and Shideler 1991).

Three of the archaeological studies bear upon *heiau* at Mānoa. Luscomb (1975) may have correctly identified the remains of Kawapōpō Heiau. Ching (1968) and Kawachi (1988a) both discuss possible identifications of a *heiau* on what appears to be two different properties located on the west side of Mānoa Stream just north of University of Hawai’i at Mānoa. It seems highly probable that Hipawai Heiau, where human sacrifices were offered, was in the immediate vicinity of these two study areas, but whether either report indeed describes remains of this temple is not altogether clear. There appears to have been no discussion of the other two known Mānoa Heiau: Kūkaō’ō Heiau (2859 Mānoa Rd.) and Hakika Heiau (near Paliluahine-Chinese Cemetery hill) since McAllister (1933). Other archaeological reports discuss minor agricultural sites or report no sites at all.

Archaeological data recovery was conducted at the Kāpapa Lo’i ‘o Kānewai (a.k.a. Kānewai Cultural Garden) in association with construction of the University of Hawai’i Center for Hawaiian Studies building (Liston and Burchard 1996). The project area was located adjacent to the east bank of Mānoa Stream, immediately *makai* of the Dole St. bridge. The Kāpapa Lo’i ‘o Kānewai, designated Site 50-80-14-4498, consisted of a 1.7-acre parcel including active cultivation of taro *lo’i* and native Hawaiian plants. The area had been restored in the early 1980s by a group including community members, University students, and alumni. It was also noted by the Hawaiian Botanical Society that the garden was home to 69 varieties of taro, including 60



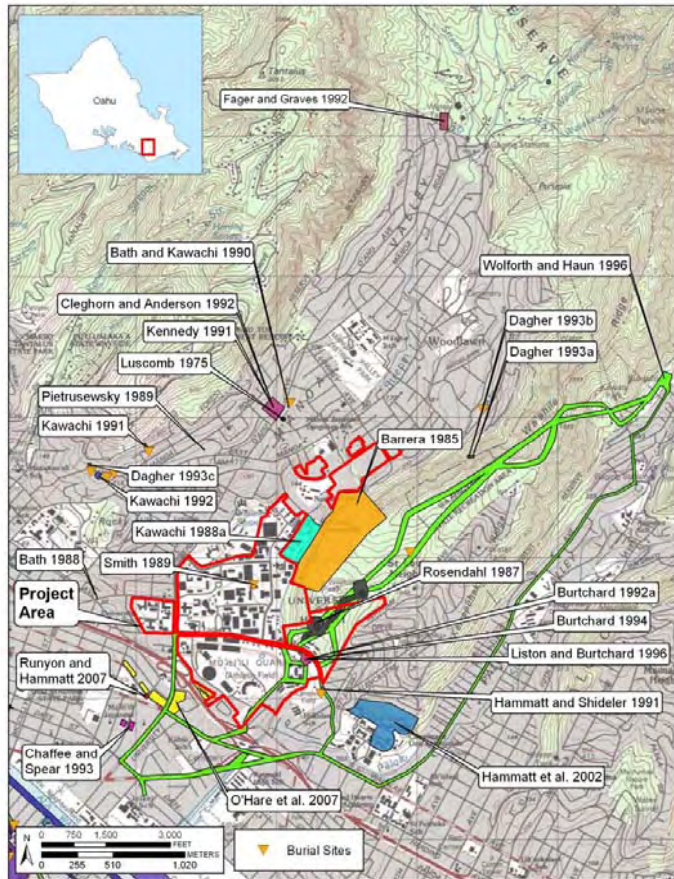


Figure 44. Previous archaeological studies in the vicinity of the project area

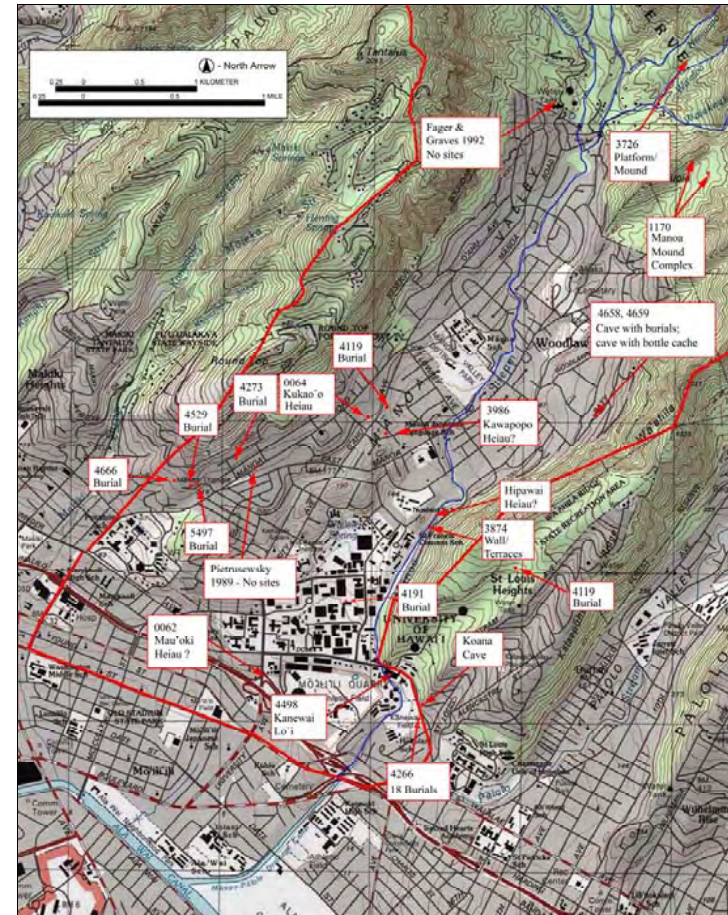


Figure 45. Previously identified archaeological sites in Mānoa Ahupua'a (project areas with no identified sites are denoted by author and year of report)





native Hawaiian cultivars (Fenstermacher 1989). Controversy arose when construction plans would have allowed encroachment into the garden area. Final plans limited disturbance to the recently restored southeastern portion of the garden area. The data recovery work was later conducted in a portion of the *lo'i* area that would be impacted by construction. Backhoe testing revealed evidence of a prehistoric irrigation system and pondfield agriculture. Radiocarbon dating of recovered samples indicated a period of prehistoric usage (A.D. 1443-1681), abandonment, and later reconstruction in the early historic period (Liston and Burtchard 1996).

**5.5 Division of Mānoa Valley**

Mānoa Valley was once divided into two sections, one for the *ali'i* and their retainers and one for the commoners. The *ali'i* lived on the high, cooler western slopes; the commoners lived on the warmer eastern slopes and on the valley floor where they tended their irrigated taro fields (Bouslog et al. 1994:12). Mary Kawena Pūku'i (in Sterling and Summer 1978:283) has stated:

In Mānoa valley a low hill at the head of the valley and Rocky hill above Punahou are said by a kinswoman of mine to have marked the division between the chiefs and the commoners in that valley. The chiefs lived on the west half, the commoners on the east. The chief's excrement was buried secretly in the commoners' ground by the keepers...The imaginary line from Puu-o Mānoa to Ka-pali huahine marks the division of Mānoa; on the left called Mānoa-ali'i, and on the right, Mānoa-Kanakaka.

Pu'u Mānoa is best known as Rocky Hill on the Punahou Campus. It seems that Kapaliuhaine - the *mauka* reference point - is the small green hill in back of the Chinese cemetery (as illustrated by Sterling and Summers 1978).

Such a cognitive division of the valley suggests that the commoners - the vast majority of the populace - would have been buried on the east side of the valley. It also seems probable that the remains of the aristocracy would be buried on the east side as well, in as much as both corpses and excrement would have shared certain cultural values of dangerousness and defilement. It may well be that the division of the valley into Mānoa - Ali'i and Mānoa-Kanakaka was drawn because the west side of the valley was generally higher and less swampy than the east side. It may have been drawn with regards to the experience of sunlight. The Mānoa Ali'i of the valley would have the experience of the rising morning sun which was associated with values of ascendancy, tumescence, vigor and fertility, while the decline of the sun which illuminates the Mānoa-Kanakaka side would have been associated with values of decay, senescence, and death.

The four known sites of prehistoric burials in Mānoa proper (Bath and Smith 1988; Smith and Kawachi 1989; the Koana Cave site; and the Dole Street site) all fall in Mānoa-Kanakaka, as defined by Pūku'i.

Perhaps significantly two prehistoric burials have been reported just to the west of Mānoa Valley (Bath and Smith 1988; Bath 1989), standing in relation to Makiki Valley much as the Kānēwai burials relate to Mānoa Valley. This suggests a possible pattern of prehistoric burial practices that may have been widespread - interring the dead near the east border of south facing valley mouths.

Reference	Type of Investigation	Site 50-80-14 Findings
Kawachi & Douglas 1991	Burial Report	473
Burtchard 1992a	Data Recovery	4498
Burtchard 1992b	Testing	
Burtchard 1994	Data Recovery	
Liston & Burtchard 1995	Site Description, Historic Literature	
Tomonari-Tuegle 1998b	Historical Research, Arch. Assessment	
Petruswsky 1992c	Burial Report	4529
Dagher 1993a	Burial Report	4658
Dagher 1993b	Site description	4659
Dagher 1993c	Burial Report	4666
Jourdane 1997	Burial Report	5497
Bishop Museum (Bowen?) 1964	Field notes	
Barrera 1985	Survey and Testing	
Rosendahl 1987	Reconnaissance Survey	
Petruswsky 1989	Burial Report	
Fager & Graves 1992	Inventory Survey	
Grune 1992	Archaeological Synthesis	
Dixon 1993	Reconnaissance Report	
Spear & Chaffee 1993	Archaeological Assessment	
Hamman & Chiofalo 1998a	Archaeological Assessment	

## Section 6 Community Consultation

Throughout the course of this CIA, an effort was made to contact and consult with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about traditional cultural practices specifically related to the project area. This effort was made by letter, e-mail, telephone and in person. In most cases, letters and emails were sent along with a map and aerial photograph of the project area with the following text:

At the request of Group 70 Inc., Cultural Surveys Hawai'i Inc. (CSH) is conducting a cultural impact assessment (CIA) for the 2007 update to the Long Range Development Plan (LRDP) for the University of Hawai'i, Mānoa Campus. The proposed project area occupies 304 acres of land in lower Mānoa Valley, bounded by the Mānoa, St. Louis Heights, Mō'ili'ili and McCully communities and is identified as Tax Map Key: (1) 2-8-15,23,24,29;various.

Group 70 Inc. proposes that the purpose for the updated LRDP is to reflect current and upcoming educational priorities. Future buildings and projects that are on the Capital Improvements Program and/or are anticipated for development within the next 5-10 years are projected into the Plan. Please see attached USGS maps and aerial views of the project area.

The purpose of this cultural study is to assess potential impacts to cultural practices as a result of the University of Hawai'i's proposed development within the Mānoa area. We are seeking your *kūia* and guidance regarding the following aspects of our study:

- **General history and present and past land use of the project area.**
- **Knowledge of cultural sites which may be impacted by future development of the project area - for example, historic sites, archaeological sites, and burials.**
- **Knowledge of traditional gathering practices in the project area, both past and ongoing.**
- **Cultural associations of the project area, such as legends and traditional uses.**
- **Referrals of *kūpuna* or elders and *kama'āina* who might be willing to share their cultural knowledge of the project area and the surrounding ahupua'a lands.**
- **Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the project area.**

Several attempts were made to contact individuals, organizations, and agencies opposite to the CIA for Mānoa. The results of the community consultation process are presented in Table 3 below. Summaries of more extensive interviews are presented in Section 7.

Table 3. Community Consultation

Name	Affiliation, Background	Comments
Ah Mai, Karen	--	Karen was referred by Paul Holtrop. CSH called on May 22 and July 3, 2008. After speaking briefly with Karen on July 3 CSH emailed a letter and corresponding figures.
Andrade, Carlos	Professor, Kamakūokalani Center for Hawaiian Studies	In an email sent to CSH on May 27, 2008, Mr. Andrade recommended that CSH speak with Ka Papa Lo'i o Kāneʻwai director Makahiapo Cashman, current staff member, Alapaki Luke, Uncle Maka, and possibly former director, Pōmaika'i Crozier.
Cashman, Makahiapo	Director, Ka Papa Lo'i o Kāneʻwai	See interview summary in Section 7.
Cooke, Sam and Mary	Mānoa Heritage Center	CSH sent a letter on February 14, 2008. A second letter with project information was sent on May 28, 2008. The Cookes declined to respond.
Freitas, Konia	Faculty, Kamakūokalani Center for Hawaiian Studies and member of Hui Mālama I Nā Kūpuna o Hawai'i Nei	See interview summary in Section 7.
Harrington, Al	Mānoa <i>kama'āina</i>	See interview summary in Section 7.
Holtrop, Paul	Mānoa Neighborhood Board, Sub-district 3 Chair	CSH sent a letter on February 14, 2008, and left a phone message on May 22, 2008. Mr. Holtrop returned the message that day and referred CSH to Karen Ah Mai.
Hughes, Clair	Kūpuna and long time resident of Mānoa	See interview summary in Section 7.
Kame'eleihewa, Lilikalā	Professor at Kamakūokalani Center for Hawaiian Studies	CSH sent letter on February 14, 2008. CSH spoke to Kame'eleihewa at Kamakūokalani on May 29, 2008 and scheduled an interview for June 4, 2008. Kame'eleihewa could not make it to the interview. A follow up email was sent by CSH on June 5, 2008. No response.
Kikilo'i, Kekuewa	<i>Kama'āina</i> and resident of Mānoa	See interview summary in Section 7.
Lucas, Paul Nāhoā	A founding member of Ho'okahe Wai Ho'oulu 'Aina and an attorney at Kamehameha Schools	See interview summary in Section 7.
McGregor, Davianna	Professor, Ethnic Studies at UH Mānoa	See interview summary in Section 7.

Name	Affiliation, Background	Comments
Nāmu'o, Clyde	Office of Hawaiian Affairs, Administrator	See comments below (and see Figure 47).
Osořo, Jon	Professor at Kamakūiokalani Center for Hawaiian Studies	See interview summary in Section 7.
Paik, Kaleo	Cultural Specialist Historic Preservation Division	Ms. Paik responded to CSH's January 18, 2008 letter of invitation to comment via an email sent to CSH on April 6, 2008. The full text of the email is reproduced following this table (below). Ms. Paik recommended that CSH speak with Dr. Clair Hughes.
Vaughn, Palani	Mānoa Kama'āina	See interview summary in Section 7.
White, Kahi	Professor at KCC, Hawaiian Studies & Mānoa <i>kama'ina</i>	Interview results are pending, and will be included in future drafts of this report, if available
Wilson, Scott	Mālama o Mānoa President	Mr. Wilson responded to CSH with an email response dated March 30, 2008. The full text of the email is reproduced following this table (below). Mr. Wilson noted that Mālama o Mānoa recommended that CSH speak with faculty from UH Mānoa's Hawaiian Studies and Anthropology Departments.

### 6.1 Office of Hawaiian Affairs (OHA) Response

OHA's response letter (see Figure 47) contained three main comments:

- (1) A recommendation that CSH conduct "...a thorough review of all archaeological and cultural reports related to the larger area which will be subject to the cultural impact assessment."
- (2) A caution that as-yet undiscovered cultural sites may still be located within the project area in subsurface deposits, despite the long history of ground disturbance and development.
- (3) A request for the opportunity to review the completed CIA.

### 6.2 State Historic Preservation Division (SHPD) Response

Ms. Linda Kaleo Paik, Cultural Specialist, SHPD, kindly contributed the following response by email (see Table 3, above, for details):

My *mana'o* for the UH Mānoa Long Range Development Plan: I would not like to see development encroach upon the valley walls. Already so much of the upper valley and front of the ridgelines have been developed. A university should incorporate the beauty of its surroundings and make sure the buildings and planning for the entire campus conforms to a large degree with the environment or natural beauty of the area. The campus changes in geography and climate within a relatively short distance. There is no uniformity at present to the entire campus with the exception of several clusters of buildings. I do not believe Mānoa can handle too much more growth in student population without impacting the nearby community and the very environment of the campus itself. There are parking issues, facility maintenance issues and lack of funding to upkeep the demands of such a large institution. There are also historic properties in the area that have and are being impacted by the student population whether it be traversing areas with a larger number of foot traffic or parking along side streets with little or no room and using pedestrian areas to park. Though these may not translate to cultural issues, they contribute to the overall well being of the environment in Mānoa.

### 6.3 Mālama o Mānoa

Mr. Scott Wilson, President of Mālama o Mānoa, contributed the following response by email:

I'd love to help with your project, but I am no expert on the history of the Mānoa ahupua'a. I am an architect by training and know only the basics about

Manoa valley and the ahupua'a it is part of. (I have lived in the valley only 10 years and before that St. Louis Heights for 20 years).

Our community group (Malama o Manoa) is geared to preserving and enhancing the social and physical assets we presently have in the valley, so we don't get into the natural history or the early Hawaiian history of the valley that much. We have our hands full just trying to prevent the valley from turning into another Kahala full of McMansions.

I would suggest consulting the book Manoa: the Story of a Valley, which was published in the 80's. That book may list some resources for further research. Also, have you spoken with faculty members in the Department of Hawaiian studies or the Department of Anthropology (Archaeology division) at the UH? I would think they could direct you to scholars who have studied the land tenure systems of pre-contact Hawaiian society.

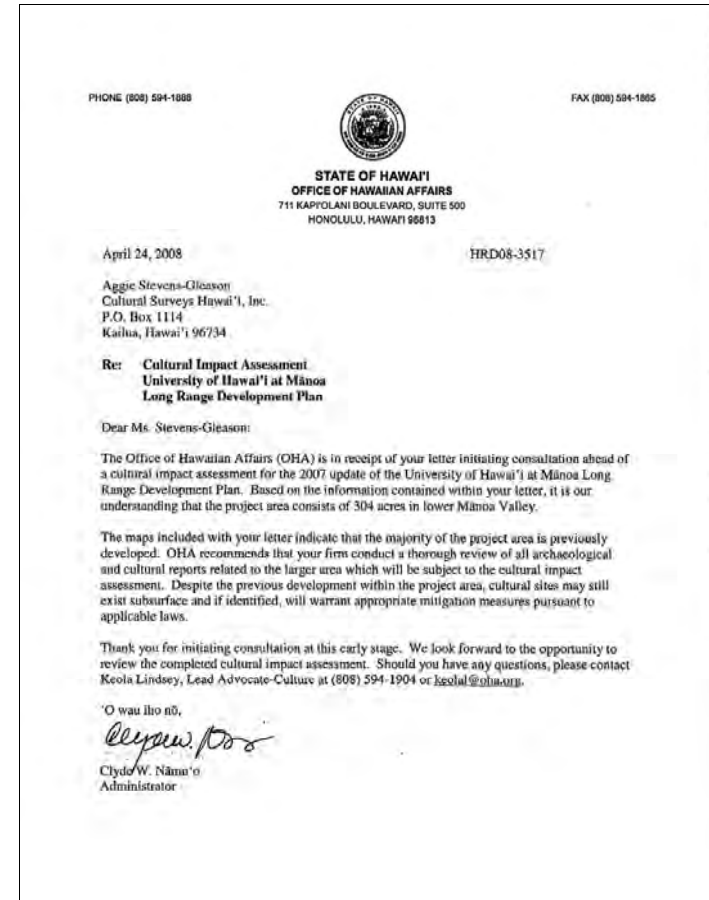


Figure 47. Office of Hawaiian Affairs response letter dated April 24, 2008



## Section 7 Summaries of Kama'āina "Talk Story" Interviews

A total of ten *kama'āina* (born in Hawai'i) and/or *k pūna* (elders) with knowledge of the Mānoa area participated in "talk story" sessions for this CIA. The approach of CSH to cultural impact studies affords community contacts an opportunity to review transcriptions and/or interview notes and to make any corrections, deletions or additions to the substance of their testimony.

CSH employs snowball sampling, an informed consent process and semi-structured interviews (cf. Bernard 2005). A total of 18 individuals and / or institutions were contacted for this CIA (see Table 3, above); two did not respond or chose not to participate; two (OHA and SHPD) responded in writing (see Sections 6.1 and 6.2, above); several people provided referrals to other individuals; and nine participated in formal "talk story" interviews. Presented below are brief backgrounds of participants "talk-story" sessions and their comments and concerns about the proposed project area. At the time of this writing, one of the "talk story" participants (Ms. Kahi Wight) was unavailable to review and approve the interview transcripts, for reasons unrelated to its content; thus, there are currently nine interview summaries presented below, with one possible additional (Wight) for future drafts of this report.

### 7.1 Al Harrington

While meeting with Palani Vaughn in Mānoa, CSH had the opportunity to speak with Al Harrington a *kama'āina* of Mānoa. Mr. Harrington was originally born in Sāmoa but moved to Hawai'i as a young child. He spent his childhood in Mānoa, and like Mr. Vaughn, remembers swimming in a water hole near the present site of Noelani Elementary. In 1954 Mr. Harrington graduated from Punahou High School. After residing on the U.S. continent for sometime he returned to Mānoa where he now resides.

Mr. Harrington's main concern is that "markers" be used to delineate *wahi pana*. These "markers" would ensure that storied places and the wisdom that is incorporated in those stories be remembered generation after generation. In addition, the naming of streets and buildings should reflect names historically associated with the area.

### 7.2 Konia Freitas

CSH conducted an interview with Konia Freitas at Kāneawai Lo'i on May 30, 2008. Ms. Freitas is a faculty member at Kamakūokalani Center for Hawaiian Studies and a member of Hui Mālama I Nā Kūpuna o Hawai'i Nei. As a planner, she assisted Ka Papa Loi o Kāneawai develop their Long Range Plan in 2007.

Freitas pointed out that burials have been found at Keller Hall and Doile Street, and believes that more burials will be found. UH is in a position to take proactive steps regarding the treatment of burials. Discussion of what should happen when human remains and burial goods are found should happen on the front end of the planning process. Procedures should be developed before any construction begins. UH is also in the position to develop progressive curatorial measures for any artifacts that may be found during construction.

Freitas also remarked that the current design of the campus is fragmented and disconnected from a sense of place. In thinking about the UHM Long Range Development Plan, there should be emphasis placed on integrating a meaningful sense of place into planned projects beyond just vernacular. Planners should ask "how can each project in the UHM LRDp honor what was in Mānoa before?" There are many *mo'olelo* (oral histories), *wahipāna* (legendary or storied places), and *akua* (gods) associated with the area. "How can a building reflect the character of a deity, for example, as opposed to just naming the building?" It would also be important to incorporate plants into the landscape that can be utilized for gathering practices and are associated with the place.

### 7.3 Davianna McGregor

CSH met with Dr. McGregor for two talkstory sessions. The first meeting was on April 23, 2008, and the second on May 8, 2008. Dr. McGregor is a professor in the Ethnic Studies Department at UH Mānoa. Dr. McGregor had the following concerns about the proposed project:

The specifics of the Long Range Development Plan need to be clearly stated. For examples, how is "expansion" of buildings and building "replacement" defined? One main concern voiced by those contacted was whether a Cultural Impact Assessment of Mānoa Valley completed at this present date be applicable for development in Mānoa proposed for least the next twenty years.

The discovery of burials is very probable. There has been multiple burials discovered on the UH Mānoa campus already. Keller Hall is the location of one reparation site. It is unmarked and is located on the NE side of the building. There used to be ginger planted on top of it, but there is nothing there anymore that distinguishes the site.

Are the trees on the campus going to be protected? Find out when the trees were planted and by whom. Many of these trees are rare and they have significance to particular sites and people (i.e. They were planted to commemorate someone or in memory of someone). Some of these trees have a function more than just to beautify the campus.

Much of the proposed project area is already developed, although there is the possibility that cultural sites still exist in the area and could be impacted by development. If impacted, appropriate mitigation should take place. Also, a thorough review of previous archaeological and cultural reports related to the area should be undertaken. There is knowledge of a habitation heiau with possible human remains located a few meters from, if not within, the boundaries of the proposed project area. Hipawai Heiau is also situated within Mānoa, possibly within the boundaries of the proposed project area.

## 7.4 Jon Osorio

On June 4, 2008, CSH met with Dr. Jon Osorio, professor at UH Mānoa's Kamakākiokalani Center for Hawaiian Studies to discuss the UHM Long Range Development Plan. He shared his knowledge of the area and *mana'o* about the project. In reference to the overall project, Dr. Osorio mentioned that burials are likely to be found, and that UH should be proactive in doing assessments before any disturbance takes place. In other words, the University "should take the steps necessary to avoid an inadvertent find."

Dr. Osorio also had specific comments regarding the proposed Wa'ahila Faculty Housing expansion, and the Hawai'i'iniūiākea School of Hawaiian Knowledge.

### 7.4.1 Wa'ahila Faculty Housing

Dr. Osorio offered the following comments:

- (1) The faculty housing is built on the *kūla* (dry-land) area.
- (2) The trails behind the housing have are being degraded and are currently being accessed for recreation (i.e., bike riding and hiking). Trash from recreational users and debris from housing along St. Louis heights (e.g., golf balls) is found along the trail.
- (3) Native medicinal plants are found along these trails.
- (4) There are one or possibly two *heiau* sites located behind the current faculty housing at Wa'ahila. Access to these sites is currently unrestricted. Dr. Osorio has observed bikers using the area as a launch point.
- (5) A plan should be developed concerning the use and protection of resources along lower Wa'ahila ridge.
- (6) The School of Hawaiian Knowledge would like to be contacted should any action be considered on the hillside above Wa'ahila faculty housing.

It is worth stating at this point that a recent archaeological field inspection by CSH of the Wa'ahila ridge area behind and above the faculty housing shows extensive evidence of tents and other living shelters and associated materials and debris (a.k.a. "homeless" or "houseless" people).

### 7.4.2 Hawai'i'iniūiākea School of Hawaiian Knowledge

According to Dr. Osorio, it is an important cultural statement that any building being built by the University be sensitive to the environment. Facilities should take advantage of the wind and sun and consume less non-renewable forms of energy.

## 7.5 Makahiapo Cashman

Mr. Makahiapo Cashman is currently the Director of Ka Papa Lo'i o Kānewai. Ka Papa Lo'i o Kānewai is an important cultural site within the project area. It welcomes approximately

15,000 visitors a year and acts as a repository for different varieties of *kalo*; it is considered by many to be a contemporary *pu'uhonua* (place of refuge or safety). It is also one of the three departments within UHM's Hawai'i'iniūiākea School of Hawaiian Knowledge.

Mr. Cashman's involvement with Kānewai began in the mid 1980s as a Hawaiian language student. Since that time he has maintained his relationship with Kānewai, as a volunteer, *limahana* (worker), and now as Director of the newly-formed center, under the Hawai'i'iniūiākea School of Hawaiian Knowledge. Mr. Cashman kindly met with CSH staff on two occasions during the assessment process to discuss the history and importance of the *lo'i* and to offer his *mana'o* (concerns or ideas) about the proposed project. The following excerpts are most relevant to the subject CIA.

### 7.5.1 Hawaiian Language

In the mid 1980s, Mr. Cashman began coming down to Kānewai as a student in Larry Kimura's Hawaiian language class for Hui Kama'ilio on Friday nights. Mr. Cashman remembers Hawaiian language always being a big part of the *lo'i*. The *lo'i* was once under Hui Aloha 'Āina Tuahine, the University's Hawaiian Language club, because many of the members of Ho'okaha Wai Ho'oulu 'Āina, were Hawaiian language students. As Mr. Cashman remembers:

This was very much Hawaiian language before. Yep, well because Hawaiian Studies eventually went off and became their own center it was easy, and close, and the proximity was close, made sense to be with Hawaiian Studies. I think Lili [Professor Kame'elehiwa] would have a better grasp of why we went under Hawaiian Studies. Because even Hawaiian Language, they weren't their own center. They were still under Pacific Languages and only recently they broke away so. But it was very much Hawaiian language. Hawaiian language was always a major part of the *lo'i*, the students and the faculty too.

### 7.5.2 Kāpuna of Kānewai

Mr. Cashman also recalls the many revered *kāpuna* who have been connected to Kānewai throughout the years. Māui *kāpuna*, Harry Mitchell, who was involved in the struggle to end the bombing on Kaho'olawe, was extremely influential in the re-opening of the Kānewai Lo'i. Uncle Maka is now the *kāpuna* at Kānewai who remains *pili* to Kaho'olawe. Over the years Kānewai has been a meeting place for many organizations including the Protect Kaho'olawe 'Ohana.

Eddie Ka'anana, another highly-respected *kāpuna* who was born and raised in Miloli'i, also played a major role at Kānewai. According to Mr. Cashman,

You know a lot of it was his Hawaiian language. He always came down, always gave *mana'o*. He was real instrumental in helping us with the *hale* [traditional house located in the center of the Kānewai Lo'i], working in the *lo'i*, how we act in the *lo'i*, just act with each other. And always around, ya he was major here. He was major here. Not only here, all over. And he took on that *kūlema* [responsibility] and he's so 'olu'olu [kind]. Always talking story. You know but still he wanted stuff certain ways too, you know. That things should be this way and done that way. Always respectful.

Mr. Cashman also recalls the times master navigator and teacher Mau Pīalug spent at Kānewai:

So Papa Mau used to come plenty too. He used to just hang out... 'come pick me up' ... so we used to go up, pick him up, we just hang out, the kids come. Ya, and then the school started coming. The charter schools started coming 'cause they knew he was here. So he would go over the star compass with kids. People pull out their kids from school. Ya like...whoa, whoa, bring the kids down, Papa Mau is teaching! Even me, I call up my wife... 'go pick up the two girls, bring 'em down', ya just hang out down here for now. Ya, like hello? It's a no brainer. Ya, that's my two daughters in there too [referring to picture]. Pili and Ulū. And then we used to take him doctor, dentist, you know, all that kine stuff when he comes down.

According to Mr. Cashman, Papa Mau also commented that the large albizia tree near the bamboo patch [note, this tree is scheduled to be removed for a streambank-protection project funded by the Federal Emergency Management Agency] was big enough to be used for a canoe, and suggested that should they one day cut it down, he would come back.

### 7.6.3 The Hale

Mr. Cashman spoke specifically about the role of the central *hale* structure:

And that's what I really think the *hale* does. The *hale* shows the amount of people that come down, because it takes so many people to do it. So that was one of the things, when Charlie [Kupa, former coordinator at Kānewai lo'i] went, he told Pō, make sure you put up another *hale*.

### 7.6.4 Kānewai as a Pu'uhonua

From the time the gardens were reopened in 1980, Kānewai has been a *pu'uhonua* (place of refuge and safety) for plants, people and culture:

It's a comfortable place. It's a *pu'uhonua*; for us, for the people, for the plants. So gives us a chance to be ourselves, practice our culture, our language. That's what Kānewai is, connecting with the place but then again, you're connecting with the people. Ya that's even more important too ya. They both are important.

### 7.6 Scott Kekuewa Kikiloi

On June 9, 2008, CSH met with Kekuewa Kikiloi, a *kama'ina* and current resident of Mānoa. Although originally from He'eia (near Kāne'ōhe) in Ko'olauloa, Kikiloi has lived in Mānoa for most of his life. His grandparents moved to the valley in the 1950s and he lived with them on occasion throughout his childhood. He currently resides in Mānoa.

### 7.6.1 Trails

Over the years Kikiloi has spent time hiking the valley and researching *mo'olelo* and *waihipana*. When asked about the traditional use(s) of the trails accessed during contemporary times he responded:

There's only one way to go usually along ridgelines. But in terms of the middle of Mānoa...I looked at the old John Papa I'i book, *Fragments of Hawaiian History*, and they have a map of Mānoa in there, where the trails actually correspond to the main roads in Mānoa. So Woodlawn, East Mānoa and Mānoa were the three trails. Makes sense, I think a lot of the trails in Hawai'i are now roads, main roads.

### 7.6.2 Gathering

Kikiloi gathers non-native bamboo in the area but explains:

Overall I don't know, there's not too many resources left in Mānoa because at one point, I think in the turn of the century, in the 1900s, a lot of it was deforested from the ranching. So when that guy Lyon, who the Lyon Arboretum is named after, he came and replanted the watershed in non-native plants just to restore the watershed. But I think since that time there isn't really a lot of native plants in Mānoa. I mean you can go hiking and you won't find too much stuff. Only on the ridgelines. Yeah I can't even think of one native plant in the valley actually, except this *h'i'o* fern, somebody planted a whole bunch of it at the head of the trail so that people could gather up. That's about it I think.

### 7.6.3 Streams

When asked about stream resources in the valley, Kikiloi comments on the changes have been observed:

I think overall the stream has diminished a lot, even since I was a kid. There was a lot more water in it. And my mom said even more when she was a kid. But it's all fed by the tributary streams that go up the valley. I think there was about seven of them. The first one being 'Aihualama where Lyon Arboretum is. That one still flows and it feeds the *lo'i* that Hālau Kū Mana takes care of. Waihi, I think that's Mānoa Falls, Waihi. That one still flows. Waihi Iki flows sometimes. I haven't seen Lua'alea or Nāniu'apo flow. And I haven't hiked all the way in there. There's actually a trail that goes back there but I always go to the Waiakeakua side. Waiakeakua still flows.

Despite changes in the stream, Kikiloi continues to gather water for 'awa (also known as kava, *Piper methysticum*) ceremonies. Oral tradition describes how certain springs in Mānoa are connected with the gods Kāne and Kāmaloa who are credited for bringing 'awa:

So in terms of water resources, that place is still really important because it's tied to the story of Kāne and Kāmaloa. Much like Kānewai and Punahou. All these places that they went to are sacred spots for water. At least for me and my friends that do 'awa ceremony we get our water from Waiakeakua spring. 'Cause it's the only really clean spring.

Kikiloi expanded on why Mānoa waters sources are so valued for their use in 'awa ceremonies:

You always want to try to go to springs or heads of water where it originates from. You know places that Kāne and Kanaloa went to are ideal places because they're the ones that brought the 'awa. So their water source and their 'awa are the best. And there isn't too many places mentioned in the stories where they went specifically, place names linked to the travelings of Kāne and Kanaloa. But Mānoā has a lot.

Other springs that Mr. Kikiloi pointed out to CSH are Wailele, located on the Mid Pacific Institute campus, and Ka Punahou located on the Punahou campus (see Figures 48 and 49).



Figure 48. Wailele Spring.



Figure 49. Punahou Spring.

#### 7.6.4 Wahipana

Although recognizing that the valley seems to have changed significantly since photographs were taken of *Lo'i* covering entire valley floors, Kikiloi has still been able to identify *wahipana* through out Mānoa area. Many of these cultural properties are connected to the story of Kahaloopuna (see Section 3.3.1.7):

I think overall it's always important to reference that story 'cause that's the story of the valley pretty much. The cultural landscape is based off the names and characters that were in the story, historical figures. There's important place names. I think of the story of 'Akāka, which is the hill area by the Chinese cemetery. If you go up that hill, that ridge line that stretches up to Wa'ahia, that's called Nālehua. The ridgeline that stretches back to Mount Olympus, Wa'aloa, is called Pali Tuahine. The names of the wind and the rains of the valley- Ka Ua Tuahine [the Tuahine Rain], Makani o Kahaukani [the Kahaukani wind] are the names of the parents of Kahaloopuna. I mean its kinda neat to me because like the rain and the wind are the parents of her, she's the rainbow right, and the *ua* Tuahine is the rain that comes straight back through the valley kind of like in a slow kind of motion, real kind of fine misty kind of rain that creeps down the valley. You can see it come down and it's blown by the Haukani wind. And when it's the right conditions and those things happen then you see the rainbow yeah. So it's like a story for one, but it's also the natural phenomenon that occurs daily.

In Waialele, which is the Mid Pac School area, there's the stone called Ka U'i o Mānoa. Which is a reference to Kahalaopuna, the beauty of Mānoa. And that stone is still there, right next to the football field. I have a picture of it in 'ihivī. I took a picture next to it. And then I wrote a story about Haukani because it's the name of the wind, but it's also the name of a tree that used to be back in valley. Kind of a super natural tree.

In previous years Kikiloi has observed Ka U'i o Mānoa being used as a graffiti rock (Figure 50). Reflecting on this activity, he notes:

They used to use it as the graffiti rock. And I just find it ironic that they're graffitiing the beauty of Mānoa- the rock that's representative of the story of the valley.



Figure 50. Ka U'i o Mānoa.

There is another *p haku* near Lyon Arboretum that Kikiloi believes may be connected to the story of Kahalaopuna:

So I checked it out and then it kind of occurred to me in the story of Kahalaopuna, in the Nakuina version, he was talking about how, you know she's buried at different places when she dies and the only place in Mānoa where she's buried is 'Aihualama actually. And up there next to a big rock is the burial place they said.

So there is a small little platform next to this really big rock which is weird, standing out in the middle of nowhere.

### 7.6.5 Concerns Regarding the Proposed Project

In reference to the Long Range Development Plan, Kikiloi commented that he:

Would like to see some consideration of the style and the feel of the buildings that are constructed; whether they create a Hawaiian sense of place or ones that are consistent with the architecture of the valley. And then also the incorporation of native plants through out the campus. I mean there's a lot of different types of botanical specimens all over the place, but there needs to be more Hawaiian plants.

### 7.7 Nāhoā Lucas

Nāhoā Lucas is one of the founding members of Ho'ōkahe Wai Ho'oulu 'Āina and an attorney at Kamehameha Schools. In 1980 as a student at UHM, Lucas, along with Keoni Fairbanks, found the remnants of an old *'auwai* near the student dormitories in the *'ili* of Kānewai. As discussed in Section 3.6, the *'ili* of Kānewai was given to Kaleiheana by Kamehameha I after the battle of Nu'uau in 1795. When Kaleiheana died the land was decided back to the descendants of Kamehameha and finally became part of the Bernice Pauahi Bishop Estate. In 1945, the land was deeded to the University of Hawai'i, which evicted several farmers who were still growing taro. Ho'ōkahe Wai Ho'oulu 'Āina was formed to preserve and protect Kānewai Lo'i. Excerpts from CSH's interview with Mr. Lucas, divided into several thematic categories, are provided below. Nāhoā Lucas' testimony is abbreviated as "NL." Questions and comments by Cultural Surveys Hawai'i are abbreviated as "CSH." The following excerpts are most relevant to the subject CIA.

#### 7.7.1 Kānewai

NL: This is called Kānewai Waikīkī, as opposed to Kānewai Kahala. What was called Kānewai Kahala is what we call Kahala today. So that was the *makai* portion of it, and this was the *mauka* portion of it. But if you look at some of the old land histories, the native testimony of John Papa 'Īi, when he files a claim for Kānewai he says there's actually several other *leles* [typically a discontinuous but related unit of land]. So not only Kahala and this area, but Helumoa, which is [where the] Royal Hawaiian Center is, where the Royal Hawaiian Hotel is, that was also an *'ili* and Pāhoā is another *'ili* in between this and Helumoa. And he ['Īi] said there were others that were in the back of Mānoa valley.

#### 7.7.2 On Opening Kānewai

NL: We were walking around. We went to Kaho'olawe in 1980 and were very excited about...that was after the bombing had stopped. They [the military] were allowing access. The island was still not cleared [of unexploded ordnance]. You still had to go with EOD from the Navy...un-exploded ordinance man. And so we went and we met Uncle Harry Mitchell from Keenae. His son, Kimo Mitchell, was with George Helm. And so he would be taking young Hawaiians over. And

In Waialele, which is the Mid Pac School area, there's the stone called Ka U'i o Mānoa. Which is a reference to Kahalaopuna, the beauty of Mānoa. And that stone is still there, right next to the football field. I have a picture of it in 'ihivī. I took a picture next to it. And then I wrote a story about Haukani because it's the name of the wind, but it's also the name of a tree that used to be back in valley. Kind of a super natural tree.

In previous years Kikiloi has observed Ka U'i o Mānoa being used as a graffiti rock (Figure 50). Reflecting on this activity, he notes:

They used to use it as the graffiti rock. And I just find it ironic that they're graffitiing the beauty of Mānoa- the rock that's representative of the story of the valley.



Figure 50. Ka U'i o Mānoa.

There is another *p haku* near Lyon Arboretum that Kikiloi believes may be connected to the story of Kahalaopuna:

So I checked it out and then it kind of occurred to me in the story of Kahalaopuna, in the Nakuina version, he was talking about how, you know she's buried at different places when she dies and the only place in Mānoa where she's buried is 'Aihualama actually. And up there next to a big rock is the burial place they said.



he noticed there was a lot of interest in rediscovering who we are. And at the time we were excited about Kaho'olawe, things Hawaiian. And then we started talking about taro because he came from Keanae, a big taro community. And eventually one thing led to another and so we went...actually as part of the Hawaiian language club, we went to Keanae, Māui.

And I can't remember if this was before we found it [Kānewai] or after, but we took a tour of this area and we were talking to him in Hawaiian and stuff like that. But we came back and Keoni and I were roommates in the dorm. We were at Noelani. And we'd always drive by this area and we just knew that anything next to the stream was probably *lo'i*. And so one day we just jumped down here and started walking up the stream and then we saw the *'auwai* there running along the base of this cliff going all the way up...we followed it up and there was a *po'owai* [upstream head of the irrigation ditch]. And so from there we started to dig it out. We dug out the *po'owai* and it was covered with roots and everything. We just kept coming back on Saturdays and actually the water flowed down. And in areas where it was broken, the walls were broken, we fixed it up and repair[ed] it, and we brought it all the way down to the Dole Street Bridge. And right when it got to Dole Street Bridge there was a remnant of a huge rusted pipe that I guess the farmer had put in. So we couldn't get it past that, so then what we did was we looked around, we became very resourceful, and we found these pipes that some of our friends had. One guy worked for...was it Gas Pro...Kilgus or something. He brought these huge, used PVC pipe, and we put it down there and we locked them in.

By that time Uncle Harry had come over [to Kānewai]. So we kept moving the water down. And that whole area that is now the *lo'i* was all California Grass [*Brachiaria mitata*], covered in California Grass, and the house had fallen down. It was just a mess over there. So with the Ethnic Studies help, we just kept moving the grass, kept pushing it back and rolled back the California Grass. And there was a *ku'una* [border of a taro patch]. You know the Okinawan farmer had basically redesigned the patches 'cause when he was there he wasn't raising it for *kalo*, he was raising it for *l'au* leaf. So he just had little concrete walkways that the water would just flow. So he wasn't caring about holding the water in. So we followed some of that. Others we modified, but we took out all that rock and then put in one after one. Each time we'd open up one, Uncle Harry would be there and we'd give it a blessing. We'd give it a name. Each of those patches has a name.

**CSH:** Yeah, how did you guys name it?

**NL:** For different events or different things that would happen. And we got that all written down somewhere. But, eventually we kept going, kept going, kept going until we came down to the halfway point where the tool shed is. And along

the way other people would come down and see what we're doing and say "oh this is cool." And we'd always work on Saturday. Try to make it a Saturday.

**CSH:** So they still have First Saturday...

**NL:** And they still have First Saturdays. And at the end of getting together, we'd have lunch, we'd have a meal. We'd cook food or people would bring up food. And eventually when we got *kalo* we'd cook it. Then the *imu* [underground oven] started. So it just kept getting bigger and bigger.

**CSH:** Did you guys have funding from the school or was it all on your own?

**NL:** It started off with people just bringing tools from home. You know, taking your mother's rake and your dad's shovel. Eventually getting money for donations...like the Hawaiian Language Club would donate some money for tools...you know rent a 'weed eater.' Then we saw how much interest there was and people were really starting to get into it. And they'd come down and we'd have big groups and we'd have 50 people show up and say, "okay, what do we do?" And we'd go, "oh, we don't know."

So we had to get organized, and then eventually we just tried to look for...well we tried to make it into the University system. And so for the most part the faculty knew what we were doing 'cause they would come down. We'd invite the classes to come down. And so we really built this ground swell of community support. Groups would come down and have a great time and they would go, "what is this project connected with?" And we say, "oh its UH." "What groups?" "Oh, Hawaiian Studies." And so our director back then, who was Abraham P'i'ianaia, he said "oh, this is a great project but let us know what your doing 'cause you know we're getting all these calls and I don't know what to tell them." And so it was fun. It was a lot of fun.

### 7.7.3 Land Use

**CSH:** So from where the *lo'i* are now to down where Kānewai Street is, was all *lo'i*?

**NL:** Right. Because the *'auwai* ran along the base of this cliff here. So if you look at the present day Wa'ahila, when it comes down...where Dole Street is, is pretty much the base of the mountain, yeah. So that's where the *'auwai* followed. The *'auwai* basically followed Dole Street all the way to Kānewai, and then it irrigated all of that area. So Kānewai field, Hōkūlani, all of those areas...these were all *lo'i*. You can see them all here. And then the road, Kalei Road came up here. This is another *'auwai*. When Kamehameha Schools had it, they had leased it out to

various farmers. They grew taro and then rice and then over the years it became truck farms. So there's a lot of truck farming up in here where the circle domms are.

#### 7.7.4 Fresh Water Resources

**NL:** This area has been, like all urban areas, pretty depleted. So there may be an occasional 'o'opu [general name for different varieties of goby fish], but we haven't seen it during our times there. One time, though, this huge 'o'opu washed down stream. It was a dead one but it was a big one. It was stuck at the *po'owai*. And it was kind of amazing because, you know, you see all kinds of things floating down stream, ducks, chickens, all kinds of things. But that was something interesting. I'm sure probably the upper regions of Mānoa there still lives 'o'opu, 'opae *ka'ahiki* [a kind of shrimp, *Atyoida bisulcata*], all those. The others may have seen some of those but we haven't. Mostly its crayfish, *dojo*, all of the common ones...guppies.

**CSH:** Not stuff that you would gather or eat?

**NL:** No, but the plan was always to try to reintroduce that and restore it. We wanted to have Hawaiian ducks, we wanted to have all that stuff but a lot of times you have to just worry about maintaining. we've had ducks, not native Hawaiian ducks, but we've had.

#### 7.7.5 Kānewai Spring

**NL:** The legend of Kānewai spring. Well, the earliest map that I can find is of...actually from Kamehameha Schools...it's the very first map that was done by Princess Ruth Ke'elikolani. This was in 1883, I think either before she died or right when she died they were trying to inventory all of her lands. ...she owned Kānewai because it was originally through a series of different things... this says Kaleiheana but they had it out with Kaleiheana's heirs and finally it was given to Victoria Kamāmalu because she had filed a claim for this land along with Kaleiheana. So there were competing claims. Anyway, Kamāmalu ended up getting this. So when she died it eventually went to her half-sister, Princess Ruth. So they did this inventory and on that map...let's see the only place I've been able to find it. This says it. So this is maybe from the 1883-84 map. You can see Kānewai Stream over here. And that's the only place there's something that actually puts this feature on it.

**CSH:** Do you remember seeing it though when you guys were clearing out?

**NL:** No. Not it the sense of if you were looking for a bubbly Board of Water Supply, in front of their office, kind of spring. It wasn't a *kik wai* [spouting water]. It wasn't a *p n kik* [spouting spring]. When we surveyed this area in maybe 1980-81 they had just built, I think, the storm drains for Dole Street, and they had put on either side, or one side next to it...they had dug it up. They had already filled a portion of this, where Keli'ipio's award is, they had taken that. This whole land was still low, all the way to the Kānewai field. It was still low but it was overgrown. The part up here was in California Grass and then as it gone down further over here it was in *Koa Haole* [*Leucaena leucocephala*]. And so we walked around this because it was a very small land-fill. And then as the Dole Street...as they dug it so they could lay the pipes down, they started to fill in here and the fill got bigger and bigger. But we would walk around this small area, this small field area, and it was still low inside here. And this whole area was wet, was very wet. We were walking along...it was very *puhi* [moist] and there was water on the ground. So maybe this was Kānewai.

**CSH:** So this is where what is today?

**NL:** Center for Hawaiian Studies, the parking lot area.

#### 7.7.6 The Holowai

**NL:** The plan was always to have...right where this area is...we called this the *holowai* [water course]. And the *holowai* was... before they filled in that area that they were going to have it for operation Kua'ana, student services center. I don't know what they have it now...some more classrooms...but the building kind of comes into there. The original plan was to follow this line. Because this line was still there. The fill had gone and had just stopped right over here. And this was like a little collection area. It would never go dry. It was always full of water. And so people were saying that was Kānewai. That wasn't Kānewai Spring. But it was an area that we wanted to connect the 'auwai down to, then have the remaining area go out. So now the water doesn't...the 'auwai gets smaller and smaller and smaller, then trickles through here and goes out there. But that was the original plan to have these as our border.

## 7.8 Claire Hughes

On May 29, 2008, CSH met with Dr. Claire Hughes, a long-time resident of Mānoa Valley, to discuss her knowledge of the valley and the project area.

### 7.8.1 Background

Dr. Hughes shared with CSH her personal connection to Mānoa:

I have lived in Mānoa since 1970. I came to the University to get my Master's degree in 1966. I loved walking to and from my car, which was parked on the streets of Mānoa.

Then, as a child in 1940's, I remember coming to Mānoa to my visit at my aunt's home (we lived on Kāua'i, so it was adventure to visit Mānoa). Her mother-in-law was Mrs. (Ella ?) Harris, who we called Kuku (not, Tutu). Kuku had farmed taro in the area and produced poi for many years. My aunt and her family lived at the *makai* end of Loomis Street. Kuku lived nearby in a two-story home on O'ahu Avenue. Kuku's house had a poi mill downstairs, although she was no longer making *poi*. We would visit Kuku, who sang and spoke to us in Hawaiian. She was wonderful. She was very old, but could walk up and down those many steps from her front door. We loved to go and see her, cuz she would sing a song about Honolulu to my older brother (that is his Hawaiian name). She always greeted us little ones with lots of aloha.

### 7.8.2 Destruction of Cultural Sites

Dr. Hughes was concerned about the continued destruction of cultural sites in Mānoa. She spoke about Pu'uhonua Heiau, the site of the Castle home (see Section 5.2.1 Kūkaō'ō Heiau for discussion), and the use of *wahipāna* connected with Kahalaopuna as examples:

One of example is the *pu'uhonua*, excuse me, the *pu'uhonua* I was just mentioning, there is one that's on that map of O'ahu. The map shows the *pu'uhonua*.... it's up against the slopes of Ualaka'a [also known as Round Top], on Pu'uhonua Street.

Anyway I've walked up there to see if anything remains of it. Its on, it's on the map [Sites of O'ahu map] with one of the indications-numbers. I walked up there and there's just homes. And there are lots of homes. And, in the last big rain that we had... Remember we when we had the 40 days and 40 nights of rain? Well, people (homeowners) that had altered hill back of their lots a little bit. And so the rains brought the earth down through their homes and down across that road into other homes on the other side of the street [Pu'uhonua Street] down the hill side, and then down across couple more homes at the end of my street. Homes were badly affected by mud. The mudslide went all the way down to Mānoa Road. The rainwater just came all the way down with mud and rubble. So anyway you cannot see it, the *pu'uhonua*. You have no idea when you look around up there, where that place was. So it's been obliterated. They've put up yards and yards of additional rock after that rain. So people have destroyed even further what ever was there.

And I think, I'm not an engineer, but I certainly think they are front loading that hillside a lot. The weight of that stone will only serve to bring more of the hillside down [with the next big rain] because, there's no way they can build the rock walls appropriately [retaining walls] to hold it all back. They're just putting

stone on like this because there's no easement on the roadside its very narrow. So, my concern is that we're allowed destruction of the *pu'uhonua* to happen. In addition, there are many tales/mo'olelo about the mountain at the end of this valley, about it being the grandmother of the Mānoa maiden. You know the story about her? So Joe Pao, the developer came up here years ago and built a whole bunch of houses and, in the process he bulldozed down half of that mountain side.

### 7.8.3 Mo'o'o

Through out the interview Dr. Hughes made reference to the different *mo'olelo* connected to Mānoa. The story of Kahalaopuna was of particular significance; however, she also spoke about the famous and well-known *mo'olelo* of Pele and Hi'i'aka and its connection with lower Mānoa:

**Cause** you know right over here where they made the freeway overpass [Lunaliilo]? That's the back of the *mo'o'o*, Kamō'i'i'ili, who was slain by Hi'i'aka. There is a statue of that *mo'o'o* on the grounds of the elementary school [Kūhio] right over there.

So the school knows about it [the *mo'o'o*]. But in order to make the freeway they cut right through the back of the *mo'o'o*. And then there's supposed to be an opening in the mountain, a tunnel [where there is water] that comes in here [Kānewai Park].

### 7.8.4 Hōlua Sledding at Pūowaina

Dr. Hughes was also disappointed that the *h lua* sled paths at Pūowaina [Punchbowl] are no longer identifiable because of development:

So did you know that on the slopes of Punchbowl there were sledding areas? I went up there one day and I said oh this is about where one slide is supposed to be. I guess you could go down on a Hawaiian sled about thirty feet and then slam in to the side of that fifteen-story building. So many apartment houses have been developed up there. So you know the sledding paths are destroyed.

### 7.8.5 Graveyards

Although Dr. Hughes noted that there are a number of sites that have already been destroyed, she believes that there continue to be places that should be protected:

Far back in the story, the projecting spear of Akaaka shows in the head of Mānoa valley. Well that was the one site they let be destroyed for houses. The point is we've already lost these [*pu'uhonua* and hillside]. There are some other sites I think that we need to discover/research a little bit more about and retain them if they are significant. Some sites are more modern actually. I think this little graveyard down here is one. I attended meetings before they worked on cleaning it up. And you know in the old days Hawaiians didn't have money to put up granite headstones, so they just put rocks, circling graves of their family

members. And everybody knew which rock circles were theirs, parents and grandparents, etc. And so when they wanted to clean up the graveyard, Families came out and said you have to be very careful how you move the rocks, as they feared the volunteer crews could just go in there and tear stuff out and then destroy the stone markers for the families. So the clean up crew was very good, I must say. You can look in there now, I've gone to the service station next door recently and its really visible compared to the old days. So, it's being maintained. It's been at least a year maybe... if not, a year and a half, two years.

It was just awful before. They have built a theater on the other side of it. One of the stories was that they built the theater over part of the graves. And the theater people were very adamant that they had not covered anything. And I guess they proved it that night in the discussion. They quieted down the fears of the woman who complained. Maybe they were able to show her some markers, I guess. But they have a concession stand that's built there. People wondered who's place the concession stand is standing on? And Kawaiha'o Church is the one who has the records of who was buried there. So their lawyer was involved in discussions preceding the clean up. I have an aunt who was buried there. So I called up my cousin to tell him I was going to represent the family. But I didn't have much to contribute except to tell them that the rock walls over there are not like other rock walls. There very easily damaged because there not made with reinforcing innards like most rock walls. They are piled up stones with cement put over. So there are no reinforcing rods, so you can't pile rubbish on top of the cement wall.

### 7.8.6 Natural Environment

When asked about other cemeteries in the valley, Dr. Hughes spoke about land use and the natural environment:

Actually I don't know where they would have been buried. Cause this part of the valley was all taro. If you are familiar with this supermarket parking lot, they can't keep it smooth because there's so much water underneath. I mean they just resurfaced it and the area by the stream is all gone already. Big pukas. Big pukas are all along that area. So you know that our soil for taro requires a lot of underground water, and there's lots, apparently. There's a story in this about being an underground river in that area [Sites of O'ahu].

And that's why UH sustained so much damage [in the October storm]. It's the natural path for the runoff from the stream...the surface stream but also the underground one. So there's stories in Sites of O'ahu (here) about that. So that...you know, I've read that thing in and out about Mānoa, but I brought this (The Legends and Myths of Hawaii) for you to see, and that the story about the princess of Mānoa is told by one of the by a highest of authorities [referring to Kalākaua]. His story is much more detailed than any other you're going to read about the Mānoa...what does he call it?...Kahaloopuna, the princess of Mānoa, .

And then did you know that up there is Kauai's body. Did you know that? [Referring to ridgeline across from Mānoa market place].

His p is over here and his toes are down here. So the project that Hawaiian Electric was going to do, to put those huge, gigantic, enormous, immense poles across Wa'ahila ridge. It would have put the poles across Kauhi's profile.

### 7.8.7 Trails

Dr. Hughes remembered hearing about a cave at Wa'ahila, which connected Mānoa to Pālolo. Although never actually seeing it herself, she has frequented the Wa'ahila trails:

Oh that's a beautiful hike. I love it. I did it many, many times.

It requires a lot of athleticism because there's some places where you have to climb up where there's no foothold to go up. You have to really be able to pull yourself up and down. So I'm too old to do it now. But I loved it. I loved that hike. It was really one that was very exciting. So that's another area over there that I think we should maintain. And make sure nobody puts another theater over there.

Dr. Hughes also remembered hearing about an old horse path around Pūowaina [Punchbowl]:

My mother who remembers coming up there as a young girl, she said the upper road that goes around Punchbowl was a horse path. Wide enough so two horses could pass by each other, and that's all. And then down below, right above the cemetery [Auwaioimu Street], between the Chinese and the other cemetery, was a cart path. Meaning, that two carts could barely pass each other- horse drawn carts. So, now we have a four-lane highway there. If you wanted to you could make four lanes there. So yes, they did put the easement probably over some of the graves. So I think that's a bad thing. I think that's really bad. Yeah, so from that perspective, I think we all have a responsibility to call out historical sites and things that we know are of value and make sure that, even if it isn't named on any site maps, if it looks like something we should be saving, we should be saving it.

### 7.8.8 Aesthetics

The visual impacts of the proposed project were also a concern for Dr. Hughes:

And besides, that's the only open area [green space, referring back to the Mānoa cemetery] your gonna find anywhere, [development surrounds it]. Who knows if their gonna put up 70 foot high buildings all over the place. Like the new Safeway sign? The Safeway changed their sign. They made it more than twice as large as it was. And look how far it's visible. It only goes one block. So why would we need that sign to be bigger? We have to really be aware that of this kind of development, like the big sign there. How far away do you need the signs to be read from less than a block away? When you go out to sea off the Kona coast you

can see Home Depot and all the "big box store" signs from two or three miles out at sea.

#### 7.8.9 Preservation of the Atmosphere

Dr. Hughes was also concerned about the increasing air traffic that can be heard through out the valley:

I have great concerns that Mānoa has become a freeway for airplanes now. The large planes used to fly very high and were unobtrusive. Now that they're saving gasoline, they're flying very low and they make so much noise. You know when they shift down to make an approach for landing, you hear them shifting down and that whining sound is very loud.

I notice it a lot more. They're lower. And you don't have to tell me they're saving gas by being lower. I know it, yes. And, up until 10:30, 11 o'clock at night, you hear them shift down.

No you can't feel it but they're very close, you can tell by the roar. And one night when the weather was *kona*, at 3:30 in the morning, a huge plane took off from the airport. It was scary because they took off very low and slowly. Previously, they used to take off in a very steep climb and the noise would be above us. Now they take off and stay very low, so you hear their engines echoing and echoing. I thought it was going to crash on Diamond Head. It was frightening. So I'm upset about that. That's not preserving our atmosphere, let alone avoiding the noise nuisance and potential crashes.

#### 7.8.10 Puka'ōma'ō

During the interview Dr. Hughes described a number of cultural sites found in Mānoa. One was Puka'ōma'ō:

Another important site is Ka'ahumanu's home, Puka'ōma'ō. It is over near Wai'oli Tea Room. It was a large grass house where she came in her last hours of life. There is a beautiful description of this in the Site of O'ahu. Ka'ahumanu died there. That house or area should be restored and saved.

#### 7.8.11 Cultural Sites On Mid Pacific Institute

A number of the *wahipāna* that Dr. Hughes mentioned were located on, or near the campus of Mid Pacific Institute:

There are several sites on the grounds of Mid-Pacific Institute that need to be recognized and preserved. I believe that the school knows where some of the sites are and have been respectful in preserving their existence. However I don't think that the Hawaiian public knows about them nor has the history of them been written. These sites belong to the collective history of Hawai'i.

There is an area in the park that I believe is a *heiau*. I was told that a UH course for teachers identified it as Pu'u Pueo, although it is not a marked site. It is very

small and faces destruction. It is in Kamanele Park. The Board of Water Supply contractor, Heron, is using the area for their dumping ground and equipment base area for about 4 or 5 years. And, it is an eyesore now. The large banyan and African Tulip trees threaten the rock formation there. It was previously used by homeless types, who put an old sofa and other things to sit on.

I hope that there will be some research into the sites in this area and preservation of them.

#### 7.8.12 References

I would also like to recommend that you contact Dennis Kawaharada, who has written a couple of books that tell of Mānoa sites. I have two books of his and some of the research that he has done and is on available on a website. "Storied Landscapes – Hawaiian Literature and Place" and "Ancient O'ahu" are two of books that he has written.

#### 7.9 Palani Vaughn

Palani Vaughn is a noted composer and musician as well as historian and *kama'ina* of Mānoa for 57 years. CSH met with Mr. Vaughn on July 28, 2008 to talk-story about his experience and knowledge of the valley. Mr. Vaughn also shared his concerns and recommendations concerning the project. The following are excerpts from an email response to questions CSH sent regarding Mr. Vaughn's knowledge of the Mānoa Valley area.

#### 7.9.1 General Comments

I firmly believe in preserving and protecting legendary and historic sites, or *wahi pana*, of Mānoa Valley, particularly because of it was treasured by the ancient ones through the reign of Kamehameha I, during his residency here following his conquest and unification of the kingdom. Particularly in light of the increased development and modernization of our 'ina.

I say this, particularly, in light of the UH Mānoa's plans to develop land areas that fall under it purview. It seems to me that these historic *wahi pana* sites and the rich legendary and cultural assets of Mānoa Valley and this valley's place in the evolving political history of the Kingdom of Hawai'i during the post-Kamehameha-the-Great Era is of immense educational value to the university and to the general educational systems, both public and private, but of particular importance to our native-Hawaiian population, who would hopefully enjoy the intangible benefits of renewed national pride through re-identifying with their Hawaiian history, legends and culture.

#### 7.9.2 Wahipāna

**Heiau 'O Kūka'ō'ō** is situated near the center of the valley. There is another heiau located nearby but I haven't had much time to research its exact location and history. Unfortunately, this *heiau* is situated on land that was owned by the Sam Cooke family, whose home overlooks and adjoins this *heiau*.

can see Home Depot and all the "big box store" signs from two or three miles out at sea.

#### 7.8.9 Preservation of the Atmosphere

Dr. Hughes was also concerned about the increasing air traffic that can be heard through out the valley:

I have great concerns that Mānoa has become a freeway for airplanes now. The large planes used to fly very high and were unobtrusive. Now that they're saving gasoline, they're flying very low and they make so much noise. You know when they shift down to make an approach for landing, you hear them shifting down and that whining sound is very loud.

I notice it a lot more. They're lower. And you don't have to tell me they're saving gas by being lower. I know it, yes. And, up until 10:30, 11 o'clock at night, you hear them shift down.

No you can't feel it but they're very close, you can tell by the roar. And one night when the weather was *kona*, at 3:30 in the morning, a huge plane took off from the airport. It was scary because they took off very low and slowly. Previously, they used to take off in a very steep climb and the noise would be above us. Now they take off and stay very low, so you hear their engines echoing and echoing. I thought it was going to crash on Diamond Head. It was frightening. So I'm upset about that. That's not preserving our atmosphere, let alone avoiding the noise nuisance and potential crashes.

#### 7.8.10 Puka'ōma'ō

During the interview Dr. Hughes described a number of cultural sites found in Mānoa. One was Puka'ōma'ō:

Another important site is Ka'ahumanu's home, Puka'ōma'ō. It is over near Wai'oli Tea Room. It was a large grass house where she came in her last hours of life. There is a beautiful description of this in the Site of O'ahu. Ka'ahumanu died there. That house or area should be restored and saved.

#### 7.8.11 Cultural Sites On Mid Pacific Institute

A number of the *wahipāna* that Dr. Hughes mentioned were located on, or near the campus of Mid Pacific Institute:

There are several sites on the grounds of Mid-Pacific Institute that need to be recognized and preserved. I believe that the school knows where some of the sites are and have been respectful in preserving their existence. However I don't think that the Hawaiian public knows about them nor has the history of them been written. These sites belong to the collective history of Hawai'i.

There is an area in the park that I believe is a *heiau*. I was told that a UH course for teachers identified it as Pu'u Pueo, although it is not a marked site. It is very



In 1993, the land was developed into a new residential area. The process of developing the area, I personally deplore, because DLNR, apparently allowed the *heiau* mound to be cut into around which a retaining wall was built at its base. One home is only three-feet away from the retaining wall of the *heiau*. This is just the kind of disrespect for our Hawaiian culture that current and future re-development of Mānoa Valley threatens (more comments re- DLNR's negligence).

I, personally, take my 2 granddaughters to visit Kū Ka 'ō'ō Heiau and to other historic sites to educate them about the above Mānoa *wahi pana* sites and to respect these sites.

**“Ka Punahou”** Spring, on the Punahou School grounds which Mānoa legend tells us that it was created by the Hawaiian god Kāne, although another legend exists.

**“Pu'u o Mānoa”**, called “Rocky Hill”, on the campus of Punahou School, situated behind the school's tennis courts

**“Puka Ōma'oma'o”** site in upper Mānoa on the 'Ewa- side of the valley, known as **Mānoa Ali'i**, where only Ali'i" could reside--the other side was Mānoa Kānaka. Puka Ōma'oma'o, which translated as, “The House of Green Shuttered Windows”, was the chosen residence of former Queen Ka'ahumanu, who, following the demise of King Kamehameha I, had become the self-appointed *Kuhina Nui*, or Premier, of the Kingdom of Hawai'i who shared the rule with both of the sons of Kamehameha-the-Great, namely Liholiho and Kauhikeaoli. Ka'ahumanu selected her house-site because it gave her a commanding view of “Waikīkī” and “Leahi”, now called “Diamond Head”, so that she could see any ships sailing to and from Honolulu, and she could also see anyone walking up the Mānoa trail to her home, and as a high-ground residence, it afforded Ka'ahumanu both privacy and security from attack, because she had, indeed, experienced rebellion among certain powerful chiefs in what was referred to as the *Pahi Kaua War*, led by chief Boki's widow Kuimi Liliha and Princess Bernice Pauahi Bishop's father Abner Pākī.

Puka Ōma'oma'o is where the legendary *ali'i wahine* Ka'ahumanu passed away in the presence of King Kamehameha III and all of the other important chiefs of the kingdom. It is said that Ka'ahumanu's bed and the walls of the room were bedecked with fresh-scented *maile* and *'awapuhi*. Kamehameha's yellow feathered cloak lay beside the bed draped over a setee, symbol of her station as *Kuhina Nui* (Together with Kamehameha I's feathered war helmet).

Mānoa legend tells us that there is a **Cave network and fresh-water Spring** situated underground in and around the Mō'ili'ili area, the healing waters in which, Kahaloapuna, “The Rainbow Maiden” daughter of Mānoa's wind, Kahaikani and Mānoa's rain, Ka Ua Tuahine, was immersed to resuscitate her from a death-state. There are, purportedly, other underground water springs according to other accounts.

Perhaps these healing waters, if we are to believe in the claims of the Kahaloapuna legend, could be of possible importance to UH Mānoa if it chose to research the claims of the legend in the future. An account that speaks of a **Cave and Natural Tunnel** that connects Mānoa Valley with Pāloalo Valley. Apparently, it was used by Kamehameha and his warriors.

**Ka Wai-a-Ke-Akua-ō-Kāne** pool and stream, were also created, according to Mānoa legend, by the god Kane. This water was revered and protected by King Kamehameha-the-Great, who placed the prostrating *kapu* upon the water as it was conveyed by his runners to his court.

There is also the legend of an ancient *Mō'ō*, or “lizard”, whose petrified severed remains are said to be in the grounds now occupied by the Hawai'i Humane Society, across from Kūhiō Elementary School, according to Pele legend.

**“Kamanele Park”** dedicated by our beloved deposed Queen, Lili'uokalani.

Location of the last home of Hawaiian scholar and preservationist, **Kawena Pūku'i**, who attended school on Mānoa in her youth, where the Mid-Pacific Institute is today.

### 7.9.3 Burials

I am not familiar with any burials, but I would bet that there are many---I would presume that such burials could be in and around the Puka Ōma'oma'o. I would also guess that there may be burials within the underground cave-network in and around Mō'ili'ili mentioned above. Or, even at and around “Kū Ka 'Ō'ō”, although DLNR would have or should have conducted an archaeological survey.

### 7.9.4 Hula

My daughter, Alison-Ka'ihiwa, is an accomplished and award-winning hula dancer, and is now a practicing *kumuhula* whose *h lau* is named, “Hālau Hula Ka-lehua-Tuahine”. Her *h lau* excelled in the newest hula competition recently created, called the “Mokihana Hula Festival” on the Island of Kaua'i and are now defending 2007 champions currently preparing to defend their *k ne* title this year's competition. She also led her *halau* to multiple title wins in the “2007 Invitational World Hula Competition” at the Waikīkī Shell in Honolulu.

She feels a deep affection for Mānoa, having lived there all of the 33 years of her life. She has told me that she is committing her life to keeping the flame of *halau* alive in Mānoa and identifies with the spirit guardian of Mānoa Valley, Tuahine, whose name she wove into the name of her *h lau*.

My daughter's *kumuhula*, Mae Klein, was a *haumana* of Māiki Aiu Lake, who was also my dear friend and one of my early cultural mentors.

My daughter's *h lau* is centered on the grounds of St. Francis School, which was also the original "home" for Māiki Aiu Lake's "Hālau Hula 'O Māiki". So, my daughter feels an identification with the spirit of Māiki Aiu both through me, her father, and through the location of her *h lau* on the historic original site of the legendary *kumuhala* Māiki Aiu of "Hālau Hula 'O Māiki".

I believe Māiki, who was Catholic may have attended St. Francis.

#### 7.9.5 Trails

As children, we climbed around "Rocky Hill", where there are small caves, or at least there were, then, when I was 12 years old.

Like many others, we often walked the trails leading to the waterfall in the back of Mānoa Valley. There was a large housing area that covered the area which includes Noelani Elementary School and the surrounding buildings, including most of the Mānoa Shopping Center and extended up the valley where the newest housing next too and across the street of where the shopping center is located.

#### 7.9.6 Recommendations

I would suggest that a learning center with a model of the valley in its olden state with *wahi pana* identified and related accounts of history and legend can be contained in recorded information that can be accessed by visitors to the learning center. Perhaps the learning center could or should be located at the Center for Hawaiian Studies on the UH Campus.

I have composed original music centered around the *wahi pana* of Mānoa and historical events and persons who were identified with the valley, which I have plans to record in CD format to help in the preservation of the legacy of history, *wahi pana* and legends connected with Mānoa Valley.

## Section 8 Cultural Landscape of the Project Area

Discussions of specific aspects of traditional Hawaiian culture as they may relate to the project area are presented below. This section examines cultural resources and practices identified within or in proximity to the subject project area in the broader context of the encompassing Mānoa landscape.

### 8.1 Plant Resources

As discussed in Section 3.5, Handy's (1940) description of Mānoa suggests the valley was once home to a substantial Hawaiian population supported by vast taro gardens:

In upper Manoa the whole of the level land in the valley bottom was developed in broad taro flats. The terraces extended along Manoa Stream as far as there is a suitable land for irrigating...About 100 terraces are still being cultivated [in the 1930s], but these do not constitute more than one tenth of the total area capable of being planted...Bennett...described the upper valley as "chequered with taro patches." (Handy 1940:77)

Presently there are few *lo'i* that still exist in the project area. However, several participants mentioned seeing old terraces in the forested uplands above the campus. Kekuewa Kikiloi, for example, tried to rehabilitate an old *lo'i* that he had identified while hiking in the back of the valley. During the conversation he also mentioned efforts being made to map old *lo'i* in the Mānoa area.

One area of active cultivation within the project area—and the primary exception to the generalization that the traditional practice of *kalo* cultivation has all but disappeared from the campus—is the Kānawai Cultural Garden, also known as Ka Papa Lo'i o Kānawai. The abandoned taro *lo'i* were rediscovered, cleared and restored by Nāhoā Lucas (an interview participant for this study) and other students at the UHM in 1980. Ka Papa Lo'i o Kānawai serves as a living storehouse of different varieties of taro that are today utilized by farmers through out the islands..

In addition, Professor Jon Osorio describes seeing native plants that can be used for medicinal purposes along the trails behind the Wa'ahila Faculty Housing.

### 8.2 Streams and Fresh Water Resources

Mānoa Valley is watered by at least five tributary streams that merge to form the lower Mānoa Stream. The five tributary streams are 'Aihualama, Waithi, Nāniu'apo, Lua'alaea, and Waiakeakua. There are seven waterfalls in the back of Mānoa Valley, named Wai'ih'i'iki, Wai'ih'i nui, Lua'aulaia, Nāniu'apo, Wa'aloa, Kahuwai'iki and Waiakeakua.

Several individuals contacted during the community consultation process talked about the diminished stream life resulting from altered stream flow. Because of this, no respondents in the interview mentioned being able to gather stream resources for subsistence purposes. However, at least one participant (Mr. Kikiloi) continues to access the Waiakeakua Pūnāwai for 'awa ceremonies; and Ka Papa Lo'i o Kānawai is dependent on the stream for cold, fresh water, which is necessary for successful *kalo* cultivation.

My daughter's *h lau* is centered on the grounds of St. Francis School, which was also the original "home" for Māiki Aiu Lake's "Hālau Hula 'O Māiki". So, my daughter feels an identification with the spirit of Māiki Aiu both through me, her father, and through the location of her *h lau* on the historic original site of the legendary *kumuhala* Māiki Aiu of "Hālau Hula 'O Māiki".

I believe Māiki, who was Catholic may have attended St. Francis.

#### 7.9.5 Trails

As children, we climbed around "Rocky Hill", where there are small caves, or at least there were, then, when I was 12 years old.

Like many others, we often walked the trails leading to the waterfall in the back of Mānoa Valley. There was a large housing area that covered the area which includes Noelani Elementary School and the surrounding buildings, including most of the Mānoa Shopping Center and extended up the valley where the newest housing next too and across the street of where the shopping center is located.

#### 7.9.6 Recommendations

I would suggest that a learning center with a model of the valley in its olden state with *wahi pana* identified and related accounts of history and legend can be contained in recorded information that can be accessed by visitors to the learning center. Perhaps the learning center could or should be located at the Center for Hawaiian Studies on the UH Campus.

I have composed original music centered around the *wahi pana* of Mānoa and historical events and persons who were identified with the valley, which I have plans to record in CD format to help in the preservation of the legacy of history, *wahi pana* and legends connected with Mānoa Valley.

### 8.3 Waihipana

Section 3 discusses the many *mo'olelo* and legendary accounts of Mānoa's *p n wai* (fresh-water springs), which are directly associated with the exploits of two primary Hawaiian gods, Kāne and Kamaloa. These springs include Kānewai, Hualani, Wailele—located near the present day athletic field of the Mid-Pacific Institute and associated with Kūka'ō'ō Hētau, Punahou (a.k.a. Kapunahou), Ka'aipū, Wa'aloha and Waiakeakua. The valley is also home to many *pu'u*, peaks, ridges and caves—all with associated *mo'olelo* and legendary accounts; these include Wa'ahila Ridge (which defines the eastern border of the valley) and its six peaks [Keana'opoi, Pu'u Pia, Pūkele, Paliuahuine (also known as Kapaliuahuine or Pali Luahine) Akāka and Kumauna], 'Ulumalu, Pu'u Pūco ("Roundtop") and Pu'u Mānoa. Mānoa is also associated with a variety of other *mo'olelo* and legends, including "Pīkoi the Rat Killer," "Maluae and the Underworld," and "The Woman Who Died and Came Back to Life," as well as famous events and people of the early historic era, including Kamehameha I (and his famous dog Poki), Ka'ahumanu and Boki (Governor of O'ahu under Kamehameha I and brother of Kalaninokū).

Many of the community members contacted for the report talked about the different places and natural phenomenon associated with *mo'olelo* discussed in Section 3. In particular, references to the *mo'olelo* of Kahaloopuna surfaced frequently throughout the community consultation process. Also, places associated with Kāne and Kamaloa continue to be of spiritual and cultural significance to a number of the participants.

### 8.4 Trails

As discussed in Section 3.7, several place names within Mānoa are located on a map of early nineteenth century trails as described by John Papa 'Ī'i (Figure 14):

Our description of the trails of the royal town is finished, but we have not yet told of the trails going to lower Waikiki, Kamoiilili, and Mānoa. . . . At Kawatahao a trail passed in front of the stone house of Kaina, late father of Kikaha. The trail went above Kalanipuu's place, along the stream running down from Poopoo to the sea, close by Kaaiehe in Makiki, to Puu o Mānoa, then below Puupueo, where a trail branched off to upper Kaaipu and Kahoiwai, and another to go below Kaahulue, to Kapulena [Pu'ulena] and Kolowalu. (ʻĪ'i 1959:92)

Kekuewa Kikilo'i pointed out that the present streets of Woodlawn, Mānoa and East Mānoa were all trails documented in 'Ī'i's work. Mr. Kikilo'i, Dr. Osorio, and Ms. Clair Hughes all mentioned hiking different trails in Mānoa. Dr. Osorio also identified the use of trails behind the present site of the Wa'ahila Faculty Housing for recreation (i.e., bike riding and hiking), but stated that much of this activity appears to be degrading the trail areas, which contain native medicinal plants. Dr. Osorio has observed these areas being littered with trash from recreational users and debris from housing along St. Louis heights. In discussions concerning Kānewai, participant, Nāhoa Lucas described Kālei Road as the old road that was used to access what is now Ka Papa Lo'i o Kānewai prior to the construction of Dole Street. Kālei Road branched off the Old Waialae Road, near the quarry, and extended through what is now the UHM Dorms. There was a bridge that connected Kālei Road to the present site of Ka Papa Lo'i o Kānewai. Remnants of the bridge can still be seen at Kānewai (see Figure 56). Regarding the topic of trails in Mānoa, Palani Vaughn talked about how, at the age of 12, he and others would climb around "Rocky Hill"

Cultural Impact Assessment for the UH at Mānoa Long Range Development Plan Project

139

TNMSs [1]-2-8-015:001; 2-8-023:003; 2-9-004:005; 2-9-023:001 & 026; 2-8-029:001; 2-9-026:001 & 037; 2-9-027:054; 3-3-056:001 & 004

[behind Punahou School, formerly known as Pu'u o Mānoa], where there were small caves, which may or may not still be there. Palani Vaughn also talked about walking "the trails to the waterfall in the back" of the valley, as did many others prior to much of the development in the lower and central valley (e.g., area of present-day Noelani Elementary School, Mānoa Shopping Center).



Figure 51. Old Kālei Road Bridge.

### 8.5 Cultural and Historic Properties and Burials

In general, the vast majority of archaeological sites once located in the Mānoa Valley have been destroyed and/or partially or entirely covered over by modern development, including the construction of the university campus in the lower valley and residential / commercial centers elsewhere. The campus is located in what used to be the prime wet-taro-growing area of the entire valley, and many *lo'i* (stone terraces) and *'auwai* (irrigation ditches) were located here; this agricultural heartland of the valley (i.e., the present-day campus) was also home to many small stone enclosures, terraces and platforms used by *maka' inana* (commoners) as house sites. The valley also was home to numerous *heiau*, some of which have been preserved into modern times, and burials.

Several participants in this study mentioned the Dole Street and Keller Hall burials and felt that there will most likely be more burials found within the campus. Palani Vaughn believes additional (as-yet undiscovered) burials may be located in around the "Puka Oma'oma'o" and "within the underground cave-network in and around Mo'i'i'i'i." According to Dr. Osorio, he has located at least one (and possibly two) *heiau* in the back of the Wa'ahila Faculty Housing site,

Cultural Impact Assessment for the UH at Mānoa Long Range Development Plan Project

140

TNMSs [1]-2-8-015:001; 2-8-023:003; 2-9-004:005; 2-9-023:001 & 026; 2-8-029:001; 2-9-026:001 & 037; 2-9-027:054; 3-3-056:001 & 004

Several respondents also noted the many cultural sites located on or near Mid Pacific Institute, including Ka U'i o Mānoa, Waialele Pūnāwai, and possibly Pu'u Pueo *heiau*.

Ka Papa Lo'i o Kānawai is perhaps the best-known cultural site on the entire campus, noted for its ongoing and active practice of *kalo* cultivation. From the time the *lo'i* were reopened in 1980, Kānawai has been a *pu'ūhonia* (place of refuge) for plants, people and culture. The *lo'i* now serves approximately 15,000 visitors a year and acts as a repository for different varieties of *kalo*. At Kānawai students and community members learn and are able to practice many aspects of *nohona* Hawai'i (Hawaiian lifestyle). A few examples of activities that occur at Kānawai include *kalo* cultivation, *imu* cooking, implement making, rock wall building, and *hale* construction. Kānawai allows people a space to practice a lifestyle that is difficult to carry out in much of the surrounding urban environment. As Mr. Cashman puts it, Kānawai "gives us a chance to be ourselves, practice our culture, our language."

In addition to Kānawai, Mānoa has also been the home of other modern initiatives aimed at preserving and perpetuating the traditions of Hawai'i Nei. For example, Palani Vaughn observed that St. Francis School—located immediately adjacent to the upper campus—was the "original 'home' for Māiki Aiu Lake's 'Hālau Hula 'O Māiki.'" Kumu Hula Māiki Aiu was instrumental in reviving interest and knowledge of older, more traditional forms of *hula*.

## Section 9 Summary and Recommendations

At the request of Group 70 International, Inc., Cultural Surveys Hawai'i, Inc. (CSH) prepared this Cultural Impact Assessment (CIA) for the University of Hawai'i at Mānoa's Long Range Development Plan (LRDP). The project area consists of the entire approximately 304-acre campus located in Mānoa [Honolulu] Ahupua'a, Kona District, Hawai'i [TMK: (1) 2-8-015:001, 2-8-023:003, 2-9-004:005, 2-9-023:001 & 026, 2-8-029:001, 2-9-026:001 & 037, 2-9-027:054, 3-3-056:001 & 004] (see Figures 1-3).

The proposed LRDP focuses on projects that are on the Capital Improvement Program and/or are anticipated for development within the next 5-10 years (see Figure 4). At this time, at least seventeen (17) new buildings or renovation/expansion projects are proposed.

In addition to conducting background research into the traditional and historic importance of the project area, in the context of Mānoa [Waikīkī] Ahupua'a and Kona District, including results from previous archaeological studies, CSH also made a substantial effort to consult with community members and organizations.

A total of 18 individuals and/or institutions were contacted for this CIA (see Table 3, above); two did not respond or chose not to participate; two (OHA and SHPD) responded in writing (see Sections 6.1 and 6.2, above); several people provided referrals to other individuals; and ten participated in formal "talk story" interviews. At the time of this writing, one of the "talk story" participants (Ms. Kahi Wight) was unavailable to review and approve the interview transcripts, for reasons unrelated to its content; thus, there are currently nine interview summaries presented below, with one possible additional (Wight) for future drafts of this report.

### 9.1 Summary of Results

Background research conducted for this project yields the following results:

- (1) Given its abundant natural resources—including several tributary streams that feed into the main stream and several *p n wai* (fresh-water springs)—Mānoa Valley has been an attractive place to settle and garden for as long as people have lived on O'ahu (i.e., well over a millennium). Lower Mānoa Valley, within which the campus is located, represents the prime wet-taro-growing area and agricultural heartland of the entire valley.
- (2) Mānoa is exceedingly rich in place names, *wahipana* (legendary or storied places) and associated *mo'olelo* (oral histories), reflecting the valley's elevated cultural and historical significance to Hawaiians, in particular. Important *mo'olelo* focus on Mānoa's many *p n wai*, which are directly associated with the exploits of two primary Hawaiian gods, Kāne and Kanaloa. These springs include Kānawai (location of the current Kānawai Cultural Garden), Hualani, Waialele—located near the present day athletic field of the Mid-Pacific Institute and associated with Kūka'ō'ō Heiau, Punahou (a.k.a. Kapunahou), Ka'aipū, Wa'aloa and Waiakeakua. The valley is also home to many *pu'u* (hills, mountains), peaks, ridges and caves—all with associated *mo'olelo*; these include Wa'ahila Ridge (which defines the eastern border of the valley) and its numerous peaks. Finally, Mānoa is also associated with a variety of other *mo'olelo*, including "Pikoi the Rat Killer,"

Several respondents also noted the many cultural sites located on or near Mid Pacific Institute, including Ka U'i o Mānoa, Waialele Pūnāwai, and possibly Pu'u Pueo *heiau*.

Ka Papa Lo'i o Kānawai is perhaps the best-known cultural site on the entire campus, noted for its ongoing and active practice of *kalo* cultivation. From the time the *lo'i* were reopened in 1980, Kānawai has been a *pu'ūhonia* (place of refuge) for plants, people and culture. The *lo'i* now serves approximately 15,000 visitors a year and acts as a repository for different varieties of *kalo*. At Kānawai students and community members learn and are able to practice many aspects of *nohona* Hawai'i (Hawaiian lifestyle). A few examples of activities that occur at Kānawai include *kalo* cultivation, *imu* cooking, implement making, rock wall building, and *hale* construction. Kānawai allows people a space to practice a lifestyle that is difficult to carry out in much of the surrounding urban environment. As Mr. Cashman puts it, Kānawai "gives us a chance to be ourselves, practice our culture, our language."

In addition to Kānawai, Mānoa has also been the home of other modern initiatives aimed at preserving and perpetuating the traditions of Hawai'i Nei. For example, Palani Vaughn observed that St. Francis School—located immediately adjacent to the upper campus—was the "original 'home' for Māiki Aiu Lake's 'Hālau Hula 'O Māiki.'" Kumu Hula Māiki Aiu was instrumental in reviving interest and knowledge of older, more traditional forms of *hula*.

Several respondents also noted the many cultural sites located on or near Mid Pacific Institute, including Ka U'i o Mānoa, Waialele Pūnāwai, and possibly Pu'u Pueo *heiau*.

Ka Papa Lo'i o Kānawai is perhaps the best-known cultural site on the entire campus, noted for its ongoing and active practice of *kalo* cultivation. From the time the *lo'i* were reopened in 1980, Kānawai has been a *pu'ūhonia* (place of refuge) for plants, people and culture. The *lo'i* now serves approximately 15,000 visitors a year and acts as a repository for different varieties of *kalo*. At Kānawai students and community members learn and are able to practice many aspects of *nohona* Hawai'i (Hawaiian lifestyle). A few examples of activities that occur at Kānawai include *kalo* cultivation, *imu* cooking, implement making, rock wall building, and *hale* construction. Kānawai allows people a space to practice a lifestyle that is difficult to carry out in much of the surrounding urban environment. As Mr. Cashman puts it, Kānawai "gives us a chance to be ourselves, practice our culture, our language."

In addition to Kānawai, Mānoa has also been the home of other modern initiatives aimed at preserving and perpetuating the traditions of Hawai'i Nei. For example, Palani Vaughn observed that St. Francis School—located immediately adjacent to the upper campus—was the "original 'home' for Māiki Aiu Lake's 'Hālau Hula 'O Māiki.'" Kumu Hula Māiki Aiu was instrumental in reviving interest and knowledge of older, more traditional forms of *hula*.

"Maluae and the Underworld," and "The Woman Who Died and Came Back to Life;" as well as famous events and people of the early historic era, including Kamehameha I, Ka'ahumanu and Boki.

- (3) The archaeology of lower Mānoa is somewhat problematic in that most of the campus was developed before historic preservation awareness and laws were in place; thus many or most surface-level sites and features once present in the project area have been destroyed and/or damaged by being covered with sediments and structures. Before these historic impacts, however, the campus undoubtedly contained a patchwork of gardens, including many *lo'i* (stone terraces) and *'aawai* (irrigation ditches), and house sites, including many small stone enclosures, terraces and platforms. Undoubtedly, there are still subsurface cultural deposits within the campus containing significant historic and cultural resources.
- (4) Burials have been documented near Keller Hall and along Dole Street, immediately adjacent to the Kānewai Cultural Garden and Kamakūokalani Center for Hawaiian Studies. The latter burials, representing the remains of at least 18 individuals, have been interpreted as a traditional Hawaiian cemetery. It is likely that more burials are located in subsurface deposits within the project area.

- (5) A recent field inspection of the campus by CSH found a number of possible rock shelters and overhangs in the Wa'ahila Ridge area. Additional study of these possible archaeological sites would have to be conducted in order to more fully understand their function, chronological age and archaeological significance.

Community consultation conducted for this project yields the following main concerns:

- (1) Many participants voiced concern about the possibility of encountering as-yet undiscovered cultural and historic sites, including most importantly, human skeletal remains and burials in subsurface deposits. One participant (Dr. Davianna McGregor) also pointed out that the burial site preserve near Keller Hall, which used to be marked by a ginger plant, is no longer being maintained (i.e., the ginger plant is not there anymore).
- (2) A few participants stated that existing undeveloped areas, including ridges and valley slopes, should not be developed or impacted in any way, given the already significant loss of such natural portions of the campus and given the importance of retaining a Hawaiian sense of place and landscape integrity. This concern about preserving the last undeveloped portions of the campus extends specifically to the Wa'ahila Ridge area.
- (3) Many participants voiced concerns about future buildings and projects being more harmoniously designed and integrated into the natural surrounding and themes inherent to the valley. It is important to note that this type of concern is fundamentally a cultural one for Hawaiians, in particular, whose 'world view' and deeper philosophical / spiritual beliefs are based on such concepts as *pono* (in this case, "right ways" of doing things) and *l kahi* ("harmony"),

among other related concepts (e.g., *m lama ' ina*, or "taking care of the land").

- (4) A few participants talked about the importance of understanding and incorporating Hawaiian-language words, phrases and concepts that extends beyond the superficial (e.g., naming buildings).
- (5) The current Director of Ka Papa Lo'i o Kānewai (a.k.a. Kānewai Cultural Garden) shared his personal knowledge of a well-known master navigator and teacher who previously indicated the large albizia tree at Kānewai Lo'i (which is scheduled to be removed in association with a stream-erosion-prevention project funded by the Federal Emergency Management Agency) could be used to construct a large traditional *wa'a* (canoe).
- (6) Many participants talked about the importance of using native plants in future projects.
- (7) The Wa'ahila Ridge area is an important natural and cultural resource, containing trails, native plants and other significant sites and features (e.g., possible rockshelter and overhangs).
- (8) A few participants provided detailed accounts of well-documented *mo'olelo*, *wahi pana* and other cultural sites in Mānoa; in one case, one participant (Palani Vaughn) suggested there is another, alternative legend associated with the origins of the well-known spring (Ka Punahou, widely attributed to Kāne), but he did not elaborate further on this point.
- (9) A couple participants called into question the State's (i.e., Department of Land and Natural Resources, Historic Preservation Division) poor record of protecting and preserving important cultural sites in Mānoa, including *heiau* that have been damaged or compromised by recent construction projects.
- (10) One participant (Palani Vaughn) suggested the university has not done enough to promote education about the traditions of old Hawai'i in Mānoa; and that it should build a "learning center" (perhaps located at the Center for Hawaiian Studies) that would integrate *mo'olelo*, *wahi pana*, the landscape and other cultural and historical information about Mānoa.
- (11) One participant (Dr. Davianna McGregor) pointed out that the Long Range Development Plan (LRDP) is not detailed enough for meaningful review and comment, and that descriptions such as building "expansion" or "replacement" are too vague. There is concern that the LRDP will be used to guide development 20 years from now, which, given the lack of detail, is problematic.
- (12) Dr. McGregor also pointed out that there are many significant and commemorative trees on campus that should be systematically catalogued in order to ensure their protection during future development of the campus.

## 9.2 Recommendations

The following recommendations are based on a synthesis of all the information gathered during preparation of this CIA. Faithful attention to these recommendations, and efforts to



develop appropriate measures to address these concerns, will help mitigate the adverse impacts of the proposed action on Hawaiian cultural beliefs, practices and resources by the project:

- (1) Community consultation participants and the wider Mānoa community should be afforded the opportunity to review the subject draft CIA and offer their input for the final version of this report.
- (2) Given the fact that the LRDP presently includes seventeen different projects (i.e., new buildings, building expansions and other infrastructure improvements), and given the lack of specific plans for these projects at the present time, the community (including participants for this study) should be afforded the opportunity to review and comment on each individual project as details become finalized and as more specific potential impacts (both positive and negative) can be assessed.
- (3) The University should proactively develop a plan to avoid disturbing as-yet undiscovered burials and other historic and cultural sites and features located in subsurface contexts. Such a plan may include archaeological inventory surveys prior to ground disturbance and / or archaeological monitoring of excavations during construction; specific decisions should be made on a case-by-case basis, in consultation with appropriate government agencies (e.g., SHPD, OHA) and Native Hawaiian organizations and individuals. In particular, every effort should be made to proactively avoid inadvertent finds of human skeletal remains and burials. The burial site preserve near Keller Hall, which used to be marked by a ginger plant, but which is no longer being maintained (i.e., the ginger plant is not there anymore), should be properly cared for (e.g., clear marking should be reestablished).
- (4) Planning and design of proposed projects included under the LRDP should incorporate Hawaiian cultural and historical themes and concepts in order to restore and accentuate an authentic Hawaiian sense of place. Minimally, this should include (a) use of native and Polynesian-introduced plants for landscaping, (b) integration of *mo'olelo*, Hawaiian language and other Hawaiian concepts and ideas that goes far beyond superficial applications of such information (e.g., building names) and (c) preservation and protection of undeveloped spaces and natural resources.
- (5) The Wa'ahila Ridge portion of the campus, one of the only undeveloped places in lower Mānoa Valley, should be carefully preserved and protected from future development, and from modern abuses and damage that have already taken their toll (e.g., soil erosion from "off-road" activities).
- (6) Ka Papa Lo'i o Kānewai, also known as Kānewai Cultural Garden, should be treated with the utmost care and respect; any plans for future improvements, alterations or development in or adjacent to Kānewai Lo'i should include comprehensive consultation with its director and with the Kamakūōkalanī Center for Hawaiian Studies.
- (7) The issue of removing the large albizia tree scheduled for removal in association with the stream-erosion-prevention project should be discussed

with the Director of Ka Papa Lo'i o Kānewai, who has indicated the tree may be used to make a large traditional *wā'a* (canoe).

- (8) Project proponents should consult with the Outdoor Circle regarding the status of significant and commemorative trees on campus; these trees should be catalogued in order to preserve and protect them.

## Section 10 References Cited

- Alexander, Mary Charlotte, and Charlotte Peabody Dodge**  
1941 *Punahou 1841-1941*. Berkeley and Los Angeles, CA.
- Armitage, George T., and Henry P. Judd**  
1944 *Ghost Dog and Other Hawaiian Legends*. Illustrated by Juliette May Fraser, Edited by Helen Lamar Berkey, Advertiser Publishing Company Honolulu, Hawai'i.
- Armstrong, Richard**  
1846 Letter in Houghton Library, Harvard University, A.B.C. 19.1, v.12. Letter 26, p.3.
- Barrera, William**  
1985 *Archaeological Survey and Testing of M noa Hillside Subdivision, M noa Valley, O'ahu*. Chimgio, Inc., Kamuela, Hawai'i.
- Bath, Joyce**  
1988 *Circle K Burial Coll, Manoa, Honolulu District and O'ahu, TMK 2-08-17-7*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.
- Bath, Joyce, and Carol Kawachi**  
1990 *Oahu Avenue Burial Investigation, Manoa, Honolulu, O'ahu Island*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.
- Bath, Joyce, and Marc Smith**  
1988 *Burial Removal at 2034 Round Top Terrace TMK: 2-5-07-43*. SHPD, State of Hawaii, Honolulu. [Contains Report "A Human Skeleton from Makiki, O'ahu, by Michael Pietrusewsky and Michele Toomay Douglas]. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.
- Bath, Joyce, Rona Idehara, and Michael Pietrusewsky**  
1988 *Circle K Burial Coll., Manoa, Honolulu District, O'ahu (2030 Wilder Avenue), TMK 2-08-17-7*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.
- Beckwith, Martha**  
1940 *Hawaiian Mythology*. University of Hawai'i Press, Honolulu, Hawai'i.
- Bernard, Russell H.**  
2005 *Research Methods in Anthropology: Qualitative and Quantitative Approaches*. Fourth Edition. AltaMira Press, Walnut Creek, California.
- Bishop Museum (Bowen, R.?)**  
1964 *Koana Cave Visit*. Bernice P. Bishop Museum, Honolulu, Hawai'i.
- Bouslog, Charles**  
1983a In Search of Ka'ahumanu's Cottage with the Green Shutters. *Historic Hawai'i News*, May 1983.  
1983 b "Ka Aina: Where the Land Came From" (In Kobayashi 1984)

Cultural Impact Assessment for the UH at Mānoa Long Range Development Plan Project

TMKs [1]-2-8-015-001; 2-8-023-003; 2-9-004-005; 2-9-023-001 &amp; 026; 2-8-029-001; 2-9-026-001 &amp; 037; 2-9-027-054; 3-3-056-001 &amp; 004

- Bouslog, Charles, and other Mānoa Valley Residents**  
1994 *M noa, The Story of a Valley*. Mutual Publishing, Honolulu, Hawai'i.
- Burtehard, Greg**  
1992a *Letter: Completion of Archaeological Data Recovery at Kapapa Lo'i K newai, Waikiki, Kona, O'ahu*. International Archaeological Research Institute Inc., Honolulu, Hawai'i.  
1992b *Letter: Backhoe Trench Placement and Schedule for Data Recovery at Kapapa Lo'i o K newai*. International Archaeological Research Institute Inc., Honolulu, Hawai'i.
- 1994 *Completion of Phase II Archaeological Data Recovery Fieldwork, Center for Hawaiian Studies, UH at M noa*. International Archaeological Research Institute Inc., Honolulu, Hawai'i.
- Chaffee, David, and Robert L. Spear**  
1993 *An Archaeological Assessment of Two Vancouver Drive Lots in Manoa Valley, Waikiki, O'ahu, Hawai'i [TMK: 2-8-16;27,29]*. Scientific Consultant Services, Inc., Honolulu.
- Ching, Francis**  
1968 *Archaeological Sites Located on the Magoon Property Given to the University of Hawai'i*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.
- City and County of Honolulu**  
2000 City and Co. of Honolulu, Dept. of Planning and Permitting. website: <http://honolulu.gov/planning/demographics/ep-toc.pdf>.
- Cleghorn, Paul, and Lisa Anderson**  
1992 *Archaeological Inventory Survey in M noa Valley, O'ahu TMK:2-9-19-36 and Preservation Plan for Kukao'o Heiau*. Paul Cleghorn Consulting, Kailua, Hawai'i.
- Coulter, John W., and Alfred G. Serrao**  
1932 *Manoa Valley, Honolulu, A Study in Economic and Social Geography*. Bulletin of the Geographical Society of Philadelphia.
- Dagher, Cathleen**  
1993a *Historic Bottle Cache in M noa Valley Cave (Site 50-80-14-4659), Waikiki, Kona, O'ahu*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.  
1993b *Inadvertent Discovery of Burial Cave Containing Multiple Burials in M noa Valley (Site 50-80-14-4658), Waikiki, Kona, O'ahu*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.  
1993c *Inadvertent Discovery of Human Skeletal Remains at 2048B Ualaka'a Street*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.
- Damon, Ethel M.**

Cultural Impact Assessment for the UH at Mānoa Long Range Development Plan Project

TMKs [1]-2-8-015-001; 2-8-023-003; 2-9-004-005; 2-9-023-001 &amp; 026; 2-8-029-001; 2-9-026-001 &amp; 037; 2-9-027-054; 3-3-056-001 &amp; 004

- 1940 From Manoa to Punahou. 49<sup>th</sup> Annual Report of the Hawaiian Historical Society for the Year 1940:5-11.
- Day, A. Grove**  
1984 *History Makers of Hawaii's*. Mutual Publishing, Honolulu.
- Day, Emily Foster**  
1906 *The Princess of Manoa and other Romantic Tales from the Folk-lore of Old Hawaii*. Paul Elder & Co., San Francisco, CA.
- DeLeon David**  
1978 *A Short History of Manoa Valley from 1800 to Present*. Manuscript available at the University of Hawaii's at Mānoa, Honolulu, Hawaii's.
- Dixon, Boyd**  
1993 *An Archaeological Reconnaissance of Five Board of Water Supply Wells on O'ahu, Hawaii's*. Anthropology Department, Bernice Pauahi Bishop Museum, Honolulu, Hawaii's.
- Douglas, Michelle**  
1990 Osteological Analysis in conjunction with *Burial Removal Near Keller Hall, UHM, Honolulu, O'ahu, Site No. 50-80-14-4191, TMK: 2-8-23:3*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii's.
- Emery, Byron Elwyn**  
1956 *Intensification of Settlement and Land Utilization since 1930 in Manoa Valley, Honolulu*. Master's Thesis, University of Hawaii.
- Fager, Mikele W., and Donna K. Graves**  
1992 *Archaeological Inventory Survey Prospective Well Site Project Area*. Paul H. Rosendahl, Ph.D. Inc., Hilo, Hawaii's.
- Fenstermacher, Ron**  
1989 *Status, Problems, and Prospects of the Hawaiian Taro Collection at Kapapa Lo'i 'o K newai*. Newsletter of the Hawaiian Botanical Society Vol 28 (2) p.22-26.
- Foote, D.E., E.L. Hill, S. Nakamura, and F. Stephens**  
1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*. U.S. Department of Agriculture, Soil Conservation Service, Government Printing Office, Washington, D.C.
- Fornander, Abraham**  
1917 *Fornander Collection of Hawaiian Antiquities and Folklore*. T.G. Thrum edit., Memoirs of the Bernice Pauahi Bishop Museum (Vol. IV, Part II), Bishop Museum Press, Honolulu, HI.
- 1918 *Fornander Collection of Hawaiian Antiquities and Folklore*. T.G. Thrum edit., Memoirs of the Bernice Pauahi Bishop Museum (Vol. V, Part I), Bishop Museum Press, Honolulu, HI.

- Fornander, Abraham**  
1919 *Fornander Collection of Hawaiian Antiquities and Folklore*. T.G. Thrum edit., Memoirs of the Bernice Pauahi Bishop Museum (Vol. V, Part III), Bishop Museum Press, Honolulu, HI.
- Foster, Nelson (ed.)**  
1991 *Punahou: This History and Promise of a School of the Islands*. Punahou School, Honolulu, Hawaii's.
- Green Laura C. S., and Mary Kawena Puku'i**  
1936 *The Legend of Kawelo and other Hawaiian Folk Tales*. Territory of Hawaii, Honolulu.
- Grune, Anna Maria Ramirez**  
1992 *Archaeological Synthesis of Waik k Ahupua'a, Focusing on M noa Valley, 'Ili of Waik k, Waik k, Island of O'ahu, Hawaii's*. University of Hawaii's, Honolulu, Hawaii's.
- Gulick, Rev., and Mrs. Orramel Hinckley**  
1918 *The Pilgrims of Hawaii, Their Own Story of their Pilgrimage from New England and Lij Work in the Sandwich Islands, now Known as Hawaii*. Fleming H Revell Co., New York.
- Hammatt, Hallett H., and Rodney Chiogioji**  
1998 *Archaeological Assessment of an Approximately 2.4-Kilometer Long Portion of the H-1 Highway from the Punahou Street Overpass to the Vineyard Blvd. Off-Ramp, Honolulu, Island of O'ahu*. Cultural Surveys Hawaii's, Kailua, Hawaii's.
- Hammatt, Hallett H., and David W. Shideler (with Michelle Douglas)**  
1991 *Archaeological Disinterment of Inadvertent Finds at Site 50-80-14-4266, On Dole Street, Kaneohe, M noa, Kona District, O'ahu*. Cultural Surveys Hawaii's, Honolulu, Hawaii's. [Contains Report "Report on Human Skeletal Remains Recovered from Dole Street, at Kaneohe Park, Mānoa, Kona District, O'ahu Appendix A, by Michele Toomay Douglas].
- Hammatt, Hallett H., David W. Shideler, and Todd Tulchin**  
2002 *Archaeological Assessment ion Support of the Kala'i pua Road Improvements Project*. Cultural Surveys Hawaii's, Kailua, Hawaii's.
- Handy, E.S. Craighill**  
1940 *The Hawaiian Planter, Volume 1*. Bishop Museum Bulletin 161, Bishop Museum Press, Honolulu, HI.
- Handy, E.S. Craighill, and Elizabeth G. Handy**  
1972 *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. B.P. Bishop Museum Bulletin 233, B.P. Bishop Museum, Honolulu, HI.
- ʻĪ'i, John**  
1959 *Fragments of Hawaiian History*. Bishop Museum Press, Honolulu, Hawaii's.
- Irwin, Bernice P.**  
1936 *In Menehune Land*. The Printshop Co., Ltd., Honolulu.

- Jones, Bruce, Conrad Erkelens, and J. Stephen Athens**  
1994 *Archaeological Monitoring of the University of Hawaii's School of Architecture Construction Project*. International Archaeological Research Institute Inc., Honolulu, Hawaii'i.
- Jourdane, Elaine**  
1994 *Inadvertent Discovery of Human Remains at 2859 M noa Rd., Sam and Mary Cooke Residence, M noa, Kona, O'ahu*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii'i.
- 1997 *Inadvertent Discovery of Skeletal Remains at Wo/Sullivan House Construction Judd-Hillside*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii'i.
- Kaui, S. M.**  
1865 *Pikoi-a-ka-Aiala. Kuokoa*, Dec. 23, 1865. Hawaiian Ethnological Notes Vol. II.
- Kamakau, Samuel Mānaikalani**  
1976 *Ruling Chiefs of Hawaii'i*. Revised Edition. The Kamehameha School Press, Honolulu, Hawaii'i.
- 1991a *Ka Po'e Kahiko. The People of Old*. Bishop Museum Press, Honolulu, Hawaii'i.
- 1991b *Tales and Traditions of the People of Old. N Mo'oielo a ka Po'e Kahiko*. Bishop Museum Press, Honolulu, Hawaii'i.
- Kawachi, Carol**  
1988a *Field Check at St. Francis High School Campus, M noa, Honolulu, O'ahu*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii'i.
- 1988b *Field Check at 2182 Round Top Drive, Honolulu, O'ahu (TMK 2-5-06:14)*. DLNR, Honolulu. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii'i.
- 1991 *Unmarked Burial Under House at 2123 Round Top Drive, Makiki, Kona, O'ahu, TMK: 2-5-07:39*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii'i.
- 1992 *Judd Hillside Burial*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii'i.
- Kawachi, Carol, and Michele Douglas**  
1991 *Burial at 2414 Sonoma Street, Lower Manoa, Honolulu, O'ahu, SHPD*. [Report contains "Human Skeletal Remains Recovered from Sonoma Street, Lower Manoa, State Site Number: 50-80-14-4273", by Michele T. Douglas]. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii'i.
- Kennedy, Joseph**  
1991 *Archaeological Examination of Kukao'o Heiau*. Archaeological Consultants of Hawaii'i, Haleiwa, Hawaii'i.

- Kobayashi, Victor N**  
1983 *Building a Rainbow: A History of the Building and Grounds of the University of Hawaii's Manoa Campus*. Hui o Students, University of Hawaii'i at Mānoa
- Kunesh, J. F.**  
1934 *Mammoth cave under King Street; geological secrets revealed*. Unpublished report prepared for John Williams, reproduced in Appendix of Wolfe 1975.
- Kuokoa**  
1915 *Kahi i Loaa Mai Ai ka Inoa Kapunahou*. How Kapunahou Got its Name. *Kuokoa* Nov. 26, 1915. Bernice P. Bishop Museum, Hawaiian Ethnological Notes, Honolulu, HI.
- Kuykendall, Ralph S.**  
1938 *The Hawaiian Kingdom, Volume I; 1778-1854 Foundation and Transformation*. University of Hawaii Press, Honolulu.
- Liston, Jolie, and Greg C. Burtchard**  
1996 *Kapapa Lo'i 'o K newai: Archaeology at the Center for Hawaiian Studies University of Hawaii'i at M noa*. International Archaeological Research Institute Inc., Honolulu, Hawaii'i.
- Luomala, Katharine**  
1951 *The Menhune of Polynesia and Other Mythical Little People of Oceania*. Bernice P. Bishop Museum Bulletin 203. Bishop Museum, Honolulu, Hawaii'i.
- Luscomb, M.L.K.**  
1975 *Report on Inspection of Heiau at 2626 Anuenue St., M noa, O'ahu*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii'i.
- Lyon, C.S.**  
1916 *Place Names. Hawaiian Ethnological Notes 1:930-946*.
- McAllister, Gilbert J.**  
1933 *Archaeology of O'ahu*. Bernice Pauahi Bishop Museum, Honolulu, Hawaii'i.
- McIntosh, James, and Paul L. Cleghorn**  
2007 *Archaeological Monitoring for the Old Quadrangle Install Chilled Water Loop, University of Hawaii at Manoa (UHM 03-521B), Manoa, Island of O'ahu, TMK (1) 2-8-23:3*. Pacific Legacy, Inc., Kaliua, Hawaii'i.
- Mellen, Kathleen (Dickenson)**  
1952 *The Magnificent Matriarch, Kaalumani, Queen of Hawaii*. Hastings House, New York.
- Nakuina, Emma M.**  
1893 *The Punahou Spring: A Legend. Thrum's Hawaiian Annual for 1893:101-104*.
- Nakuina, Emma M.**  
1904 *Hawaii, Its People, Their Legends*. Hawaii Promotion Committee, Honolulu, Hawaii'i.

- 1907 The Springs of Waialeale. Where Fact & Fancy Meet. *The Mid-Pacific Student* VI:Aug. 1987, pp. 22-26.
- Oceanit**
- 2004 **DRAFT: Ala Wai Flood Abatement and Ecosystem Restoration; Ala Wai Watershed Riparian Survey, 2004.** Prepared for the Army Corps of Engineers by Oceanit, Honolulu, HI.
- O'Hare, Constance R., David W. Shideler, and Halleff H. Hammatt**
- 2007 *Archaeological Literature Review and Field Inspection for Kamehameha Schools University Parcels and Varsity Theater Parcel in Mānoa, Waikā. Ahupua'a, Honolulu District, O'ahu Island, TMK: (1) 2-8-006:001, 020, 023, 025, 032, 036, 038, 039, 040, 041, 042, 043, 048, 052, 057, 058; 2-8-024:013, 030, 031, 032, 033, 034; 2-8-025:047, 048, 049, 050, 051, 052, 053, 054.* Cultural Surveys Hawaii'i, Kailua, Hawaii'i.
- Pietruszewsky, Michael**
- 1989 *Cremated Remains Found at 2464 Mānoa Rd., April 12, 1989, State Historic Preservation Division, Honolulu, Hawaii'i.* University of Hawaii'i at Mānoa, Honolulu, Hawaii'i.
- 1992 *Human Remains found at 1908 Judd Hillside Road.* University of Hawaii'i at Mānoa, Honolulu, Hawaii'i.
- Pukui, Mary Kawena**
- 1983 *ʻIlelo Noʻeau, Hawaiian Proverbs & Poetical Sayings.* Bernice P. Bishop Museum Special Publication No. 71, Bishop Museum Press, Honolulu, Hawaii'i.
- Pukui, Mary Kawena, and Caroline Curtis**
- 1951 *The Water of Kane and Other Legends of the Hawaiian Islands.* Collected or Suggested by Mary Kawena Pukui, retold by Caroline Curtis, Illustrated by Richard Goings. The Kamehameha Schools Press, Honolulu, Hawaii'i.
- 1960 *Tales of the Menehune, The Kamehameha Schools Press, Honolulu.* Collected or Suggested by Mary Kawena Pukui'i, Retold by Caroline Curtis, Illustrated by Robin Burningham. The Kamehameha Schools Press, Honolulu, Hawaii'i.
- Pukui, Mary Kawena, and Samuel H. Elbert**
- 1986 *Hawaiian Dictionary.* 2nd Edition, University of Hawaii Press, Honolulu, Hawaii'i.
- Pukui, Mary K., Samuel H. Elbert, and Esther Mookini**
- 1974 *Place Names of Hawaii.* University of Hawaii Press, Honolulu, Hawaii'i.
- Pultz, Mary Anne (Ed.)**
- 1981 *A Botanist's Visit to Oahu in 1831: Being the Journal of Dr. F. J. F. Meyen's Travels and Observations about the Island of Oahu.* Press Pacifica, Ltd., Kailua, Hawaii'i.
- Robb, Peggy, and Louise Vicars**
- 1982 *Mānoa's 'Puuhonua' : The Castle Home, 1900-1941. The Hawaiian Journal of History* vol. 16:171-183.

- Rosendahl, Margaret L. K.**
- 1987 *Archaeological Reconnaissance Survey Waahila Reservoir Project Area, Waahila Ridge, Mānoa, Honolulu, Island of Oahu (TMK:3-5-56:Por.1, Por.2).* Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawaii'i.
- Skinner, Charles M.**
- 1971 *Myths & Legends of Our New Possessions & Protectorate.* Gryphon Books, Ann Arbor MI.
- Smith, Marc**
- 1988a *Site 50-80-14-3726, Pu'u Pia Trail Site, Honolulu, Kona, Oahu.* Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii'i.
- 1988b *Site 50-80-14-1170 Mānoa Mound Complex Site (TMK 2-9-51:13), Kona, Honolulu Ahupua'a.* Department of Land and Natural Resources, Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii'i.
- Smith, Marc, and Carol Kawachi**
- 1989 *Burial Removal Near Keller Hall, UHM, Honolulu, O'ahu. Site No. 50-80-14-1491, TMK: 2-8-23:3.* Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii'i.
- Soehren, Ljovd**
- 1963 Field notes on agricultural terraces (Site 3953) located in Mānoa Valley. Department of Anthropology, B.P. Bishop Museum, Honolulu.
- Sterling, Elspeth, and Catherine Summers**
- 1978 *Sites of O'ahu.* Bernice Pauahi Bishop Museum, Honolulu, Hawaii'i.
- Stewart, Charles S.**
- 1831 *A Visit to the South Seas, in the U.S. Ship Vincennes, During the Years 1829 and 1830.* 2 Vols. Haven, New York.
- Stokes, John F. G.**
- 1941 *Puuhonua: The Castles in Mānoa Valley. Pan-Pacific* April-June 1941. Published by the Pan-Pacific Union, Honolulu.
- Taylor, Clarice B.**
- 1953 "Tales About Hawaii," serial column in *Honolulu Star-Bulletin*.
- Thom, Wah C.**
- 1985 *The Story of Mānoa Chinese Cemetery with a Discussion of Ancestor Worship.* Lin Yee Chung Association, Honolulu.
- Thrum, Thomas G.**
- 1892 *Mānoa Valley. Hawaiian Almanac and Annual* for 1892.
- 1907a Heiau and Heiau Sites Throughout the Hawaiian Islands. *Hawaiian Almanac and Annual* for 1908, pp. 38-47, Honolulu, Hawaii'i.
- 1907b Tales from the Temples. *Hawaiian Almanac and Annual* for 1907. Honolulu, Hawaii'i.



- 1909 Heiaus and Heiau Sites Throughout the Hawaiian Islands. *Hawaiian Almanac and Annual* for 1909, Honolulu, Hawai'i.
- 1998 *Hawaiian Folk Tales: A Collection of Native Legends*. Introduction by Glen Grant, Mutual Publishing, Honolulu, HI.
- Tomonari-Tuggle, Myra**  
 1998a *Proposed National Marine Fisheries Service Honolulu Laboratory Renewal Project: Historical Research and Assessment of Archaeological Potential*. International Archaeological Research Institute Inc., Honolulu, Hawai'i.
- 1998b *Kukao'o Heiau: A Glimpse at M noa's Past Historical Research and an Interpretive Master Plan*. International Archaeological Research Institute Inc., Honolulu, Hawai'i.
- Westervelt, W. D.**  
 1904 Hawaiian Burial Caves. *Hawaiian Almanac and Annual* for 1904.
- 1963a *Hawaiian Legends of Old Honolulu*. Charles Tuttle Co., Rutland, VT.
- 1963b *Hawaiian Legends of Ghosts and Ghost-Gods*. Charles E. Tuttle, Tokyo.
- Williams, John**  
 1935 The Romance of Honolulu's Prehistoric Caves. *Honolulu Star Bulletin*, Jan. 5, 1935.
- Williams, Norma M.**  
 1980 Forgotten 'Apana of Kawaiaha'o Church. *Historic Hawai'i News*, December 1930.
- Wolfe, James E.**  
 1975 Map Location and Dimensional Definition of Subsurface Caverns. Senior Honors Thesis, Dept. of Geology and Geophysics, University of Hawai'i, Honolulu.