Jan S. Gouveia
Vice President for Administration

UNIVERSITY of HAWAIʻI® SYSTEM

August 15, 2022

Director
State of Hawaiʻi
Office of Planning and Sustainable Development
Environmental Review Program
235 South Beretania Street, Room 702
Honolulu, Hawaiʻi 96813

Subject: Final Environmental Assessment – Finding of No Significant Impact (FEA-FONSI)
University of Hawaiʻi
Long Range Development Plan Update
Mānoa Campus
Honolulu, Oʻahu, Hawaiʻi

Dear Director:

The University of Hawaiʻi (UH) herewith transmits the subject Final Environmental Assessment for which it has determined a Finding of No Significant Impact (FEA-FONSI). The FEA-FONSI has been prepared pursuant to Chapter 343, Hawaiʻi Revised Statutes and Chapter 11-200.1, Hawaiʻi Administrative Rules. Please publish notice of this FEA-FONSI in the upcoming issue of *The Environmental Notice*.

Included in the FEA-FONSI are a Noise Study, Cultural Resources Report (Archaeological Literature Review and Cultural Assessment), Traffic Impact Reports, and Traffic and Parking Management Plan, and copies of comments received during pre-assessment consultation, as well as the Draft Environmental Assessment, along with the corresponding responses regarding the subject project.

Please contact our consultant, Mr. Keola Cheng at (808) 946-2277 if you have any questions.

Sincerely,

Jan Gouveia
Vice President for Administration
University of Hawaiʻi

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Honolulu, Hawaiʻi 96822
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Action Name
University of Hawai‘i, Mānoa Campus, Long Range Development Plan Update
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))
Multiple
Action type
Agency
Other required permits and approvals
See Section 4.3 of FEA
Proposing/determining agency
University of Hawaii
Agency contact name
Jan Gouveia
Agency contact email (for info about the action)
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Email address or URL for receiving comments
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Yes
Consultant

Wilson Okamoto Corporation

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Action summary

With the stabilization of the UHM campus population and limited fiscal resources / funding sources available for the development of new facilities, the UHM has shifted its focus to facility optimization and reduction of deferred maintenance and right-sized renovations to modernize the existing UHM campus. By repurposing and renovating their current facilities to accommodate a broader base of users and multiple disciplines, the UHM seeks to maximize and optimize the use of existing space and operate within the projected gross square footage set forth in the 2007 LRDP/2009 PRU through its LRDP Update.

Reasons supporting determination

See Chapter 6

Attached documents (signed agency letter & EA/EIS)

- ERP-Transmittal-Letter-8-15-22.pdf
- Final-UH-LRDP-FEA-Volume-I-8.15.22.pdf
- FEA-Appendices-Combined-Volume-II.pdf

Shapefile

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

Action location map

- UH-LRDP-Project-Area.zip

Authorized individual

Dalton Beauprez

Authorization

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

Volume I

University of Hawai'i at Mānoa Long Range Development Plan

Final Environmental Assessment

August 2022

PREPARED FOR:
University of Hawai'i at Mānoa

Wilson Okamoto Corporation

Preface and Summary

PREFACE

This Final Environmental Assessment (EA) / Finding of No Significant Impact (FONSI) has been prepared pursuant to Chapter 343, Hawai‘i Revised Statutes (HRS), and Title 11, Chapter 200.1, Hawai‘i Administrative Rules (HAR), Department of Health, State of Hawai‘i.

This EA is required because the Proposed Action is an “agency action” that involves the use of State lands and funds pursuant §343-5(a)(1). The proposing agency is the University of Hawai‘i (UH), which is also responsible for determining that the Final EA can be filed as a Finding of No Significant Impact (FONSI).

The technical studies prepared in conjunction with this EA include a Noise Study, Cultural Resources Report (Archaeological Literature Review and Cultural Assessment), Traffic Impact Report (TIR), and Traffic and Parking Management Plan. The studies are appended to this EA. Since the Draft EA, the TIR has been updated to have the most updated project descriptions of the Proposed Action. Also, a Preliminary Engineering Report, as well as a specific TIR for the Clarence T.C. Ching Athletic Complex Phase 2 Expansion project has been added to the Final EA.

It should be noted that on February 25, 2021, an Early Consultation/Pre-Assessment Package for the Clarence T.C. Ching Athletic Complex Phase 1 Expansion was mailed out to State and City and County of Honolulu agencies, as well as various community stakeholders. Shortly thereafter, the University of Hawai‘i determined that the Clarence T.C. Ching Athletic Complex Phase 1 Expansion would not require the preparation of Chapter 343, HRS environmental assessment as previous disclosure documents adequately assessed the general nature of the proposed improvements. However, the comments received from the February 2021 Early Consultation/Pre-Assessment Package for the Clarence T.C. Ching Athletic Complex Phase 1 Expansion were reviewed and are incorporated within this EA documentation to the extent feasible as it relates to the Clarence T.C. Ching Athletic Complex Phase 2 Expansion (further described in Section 2.2.1.4). The comments received from the February 2021 Early Consultation/Pre-Assessment Package for the Clarence T.C. Ching Athletic Complex Phase 1 Expansion are responded to and reproduced in Appendix J, along with the comments received on the Proposed Action. Comments and response regarding the Draft EA have also been reproduced and appended to this Final EA as Appendix K.

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Summary

Type of Document:	Final Environmental Assessment (EA) **/** Finding of No Significant Impact (FONSI)
Proposing and Accepting Agency:	State of Hawai'i - University of Hawai'i
Name of Action:	University of Hawai'i, Mānoa Campus, Long Range Development Plan Update
Location:	Mānoa, O'ahu, Hawai'i
Tax Map Keys (TMKs):	2-8-7: 29; 2-8-15: 1; 2-8-16: 1; 2-8-23: 3, 9-19; 2-8-26: 14; 2-8-29: 1, 30-34; 2-9- 2: 12; 2-9-4: 5 & 7-10; 2-9-13: 54; 2-9-23: 1, 26; 2-9-26: 1 & 37; 2-9-27: 54; and 3-3-56: 1.
Recorded Fee Owner:	State of Hawai'i - University of Hawai'i
Land Area:	Approximately 308 Acres
State Land Use Classification:	Urban
City & County Development Plan:	Primary Urban Center Development Plan
City & County Zoning Designation:	Residential R-5: TMK 2-8-29:1; 2-8-15:1; 2-8-23: 3, 12, 13, 16; TMK 3-3-56: 1 & 4 (por.) Residential R-7.5: TMK 2-9-4:5; 2-9-23: 26 & 1; 2-9-26: 37 & 1; 2-9-27:54 P-1 Restricted Preservation and P-2 General Preservation: TMK 3-3-56: 1 & 4 (por.)
Plan Review Use Resolutions:	PRU Resolution No. 09-341, CD1, FD1 and PRU Resolution No. 21-127, CD1
SMA:	Not in SMA
Flood Zone:	Zone X (500 Year Flood) and AE
Special Designation:	Not in Special Design District
Existing Use:	The UHM is the largest and oldest of the ten campuses within the overall UH system, and offers hundreds of undergraduate, graduate, doctoral, and professional degree programs. The UHM is classified as one of Nation's prestigious 115 Carnegie Reasarch-1 (R1) Universities and is also one of only a handful of Land-, Sea-, Space-, and Sun-Grant institutions. The UHM also features 21 National

Collegiate Athletic Association (NCAA) Division I athletic programs with approximately 450 student athletes competing on men's, women's, and co-ed varsity teams. The UHM has been widely recognized as a world-class university that provides affordable, quality higher education to serve the people of Hawai'i and conducts leading edge, pioneering research to address critical issues facing the State, Nation, and World at large. For at least three decades prior to 1987, the UHM campus developed without an approved physical development plan. In 1987, the UH Board of Regents adopted the first UHM Campus LRDP. The LRDP document provided an organizing vision for the overall UHM campus and guided subsequent development in a manner to address and correct deficiencies from prior unplanned growth and development. It was anticipated in the 1987 LRDP that the document would require updating in five-to-six-year intervals to adequately respond to changes in academic priorities, Capital Improvement Projects (CIP), enrollment, environmental issues, funding, changes in the UHM campus from construction of new buildings, and other major factors influencing the UHM campus development. This update was also necessitated by the CCH's requirement for a PRU approval prior to the issuance of building permits. The last update to the UHM LRDP occurred in 2007.

Proposed Action:
With the stabilization of the UHM campus population and limited fiscal resources / funding sources available for the development of new facilities, the UHM has shifted its focus to facility optimization and reduction of deferred maintenance and right-sized renovations to modernize the existing UHM campus. By repurposing and renovating their current facilities to accommodate a broader base of users and multiple disciplines, the UHM seeks to maximize and optimize the use of existing space and operate within the projected gross square footage set forth in the 2007 LRDP/2009 PRU through its LRDP Update.

Impacts: No significant impacts are anticipated to result from the Proposed Action. It is anticipated that the best management practices and mitigation measures discussed in Chapter 3 of the EA will minimize/reduce/eliminate any potential impacts to the various resource categories presented.

Determination: Finding of No Significant Impact (FONSI)

Parties Consulted During Pre-Assessment:

Federal Agencies
U.S. Army Corps of Engineers
U.S. Department of the Interior, Fish and Wildlife Service
U.S. Environmental Protection Agency
U.S. Federal Aviation Administration

State Agencies
Department of Accounting and General Services
Department of Agriculture
Department of Business, Economic Development, and Tourism (DBEDT)
DBEDT, Strategic Industries Division
DBEDT, Hawai'i State Energy Office
DBEDT, Land Use Commission
DBEDT, Office of Planning and Sustainable Development (OPSD)
DBEDT, OPSD-Environmental Review Program
Department of Defense (DOD)
DOD, Hawaii Army National Guard
Department of Education
Department of Health (DOH)
DOH, Environmental Management Division
DOH, Hazard Evaluation and Emergency Response Office
DOH, Wastewater Branch
DOH, Safe Drinking Water Branch
Department of Land and Natural Resources (DLNR)
DLNR, Office of Coastal and Conservation Lands
DLNR, State Historic Preservation Division
Department of Hawaiian Home Lands
Department of Transportation (DOT)
DOT, Airports Division
Hawai'i Community Development Authority
Office of Hawaiian Affairs

City and County of Honolulu Agencies
Fire Department
Police Department
Department of Environmental Services
Department of Planning and Permitting
Department of Parks and Recreation
Department of Design and Construction
Board of Water Supply
Department of Transportation Services
Department of Facility Maintenance
Office of the Mayor

Elected Officials
Senator Brian Taniguchi
Senator Les Ihara
Senator Sharon Moriwaki
Senator Brian Schatz
Representative Dale Kobayashi
Representative Della Au Belatti
Representative Scott Saiki
Representative Scott Nishimoto

Representative Bert Kobayashi
Representative Jackson Sayama
Councilmember Carol Fukunaga
Councilmember Ed Case
Councilmember Calvin Say
Councilmember Tommy Waters

Utility Companies
Hawai‘i Gas
Hawaiian Electric Company
Hawaiian Telcom
Spectrum Hawai‘i

Library / Depositories
Hawai‘i State Library
Hamilton Library
Mānoa Public Library

Other Interested Parties and Stakeholders
Kaimuki - Neighborhood Board No. 4
Diamond Head/ Kapahulu/ St. Louis Heights – Neighborhood Board No. 5
Mānoa – Neighborhood Board No. 7
McCully/Mō‘ili‘ili – Neighborhood Board No. 8
Waikiki – Neighborhood Board No. 9
Maikiki – Neighborhood Board No. 10
St. Louis Heights Community Association
Mānoa Outdoor Circle
Mālama Mānoa
Mō‘ili‘ili Hongwanji Buddhist Temple – Mō‘ili‘ili Hongwanji Mission
Japanese Cultural Center of Hawai‘i
Mō‘ili‘ili Community Center
Kamehameha Schools
Punahou School
Ron Lockwood
Laura Ruby
Jeremy Lim

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Appendix D Draft University of Hawai‘i at Mānoa Drainage Master Plan

Appendix E UH Mānoa PV Power Plant Project

Appendix F Cultural Resources Report (Archaeological Literature Review and Cultural Assessment) for the University of Hawai‘i at Mānoa Long Range Development Plan Update (UHM LRDP Update), Waikīkī Ahupua‘a, Kona Moku, O‘ahu Island

Appendix G Acoustic Study For The Clarence T.C. Ching Complex Expansion 17,000 Seat Football Stadium, University Of Hawaii At Manoa

Appendix H-1 University of Hawaii at Manoa 2019 Long Range Development Plan Update Traffic Impact Report (Updated August 2022)

Appendix H-2 Clarence T.C. Ching Athletics Complex Transportation and Parking Management Plan

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Appendix I Preliminary Engineering Report Civil Infrastructure

Appendix J Early Consultation/Pre-Assessment Comments and Responses for Clarence T.C. Ching Athletic Complex Phase 1 Expansion and LRDP

Appendix K Draft Environmental Comments and Responses

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Chapter 1:

Introduction

CHAPTER 1: INTRODUCTION

1. INTRODUCTION

This Final Environmental Assessment (EA) assesses the anticipated environmental effects of the adoption and implementation of the proposed University of Hawai'i at Mānoa (UHM) 2019 Long Range Development Plan (LRDP or LRDP Update) which is included herein as Appendix A.

The UHM has prepared the LRDP as a comprehensive physical land use plan and policy document to guide the physical development of the campus to accommodate UHM's future growth, research activities, optimize existing facilities and improve space efficiencies, improve the campus experience, and ensure the campus space reflects the broader values and objectives of the UHM through to the year 2030, the LRDP horizon. The LRDP outlines the direction for an overall reduction in square footage for core academic facilities and uses by roughly 500,000 square feet (sf); transform circulation and mobility; to strengthen the gathering spaces on campus; establish the UHM as a learning lab by addressing long-term needs for the research facilities; activate landscape spaces and the campus character; create spaces that support the UHM community; and build resilience through climatological foresight.

The implementation of the LRDP Update (herein after referred to as the "Proposed Action") will require the use of State lands and funds and is thereby subject to environmental review and documentation requirements in accordance with Chapter 343 of the Hawai'i Revised Statutes (HRS). While some of the individual projects listed above may be exempt from the requirements of Chapter 343, HRS, or have or are currently going through their own Chapter 343, HRS process, it has been determined by the University of Hawai'i (UH), in alignment with Title 11, Chapter 200.1 of the Hawai'i Administrative Rules (HAR), that the overall Proposed Action required the preparation of an EA, which evaluates and assesses the effects of the Proposed Action. Specifically, this effort encompasses an evaluation of primary, secondary, and cumulative effects, in alignment with Chapter 343, HRS and Title 11, Chapter 200.1, HAR. The EA also identifies feasible means of avoiding or substantially lessening significant adverse impacts and evaluates a range of reasonable alternatives to the Proposed Action, including the required No Action alternative. As noted in the Preface of this document, this EA is being prepared as an "agency action." The proposing agency is the UH, which is responsible for determining that the Final EA can be filed as a Finding of No Significant Impact (FONSI). This EA will support the subsequent Plan Review Use (PRU) permit application required for the Proposed Action that will be subject to review and approval by the City and County of Honolulu Department of Planning and Permitting (DPP).

In summary, this EA serves as a disclosure and informational document intended to identify the anticipated environmental effects of implementing the Proposed Action, and evaluate the potential of their significance. The UH has prepared this EA for the Proposed Action for the following purposes:

- To inform and provide the general public, the local community, Federal, State, and City and County of Honolulu (CCH) agencies, as well as any other interested stakeholders, an opportunity to comment on the Proposed Action and its

environmental effects, feasible measures to mitigate those effects, as well as the reasonable and feasible alternatives;

- To enable the UH to consider the environmental consequences of adopting and implementing the Proposed Action and approving those specific projects identified in the LRDP;

- To enable responsible agencies to consider the environmental consequences of the Proposed Action for which they have a role in approving or issuing permits; and

- To satisfy Chapter 343, HRS requirements.

1.1 Background Information

The UH was established in 1907 as a land-grant college of agriculture and mechanical arts at a temporary site in downtown Honolulu. The UH subsequently moved to its present location in Mānoa Valley in 1912. The UHM is the largest and oldest of the ten campuses within the overall UH system, and offers hundreds of undergraduate, graduate, doctoral, and professional degree programs. The UHM is classified as one of Nation's prestigious 115 Carnegie Reasarch-1 (R1) Universities and is also one of only a handful of Land-, Sea-, Space-, and Sun-Grant institutions. The UHM also features 21 National Collegiate Athletic Association (NCAA) Division I athletic programs with approximately 450 student athletes competing on men's, women's, and co-ed varsity teams. The UHM has been widely recognized as a world-class university that provides affordable, quality higher education to serve the people of Hawai'i and conducts leading edge, pioneering research to address critical issues facing the State, Nation, and World at large.

For at least three decades prior to 1987, the UHM campus developed without an approved physical development plan. In 1987, the UH Board of Regents adopted the first UHM Campus LRDP. The LRDP document provided an organizing vision for the overall UHM campus and guided subsequent development in a manner to address and correct deficiencies from prior unplanned growth and development. It was anticipated in the 1987 LRDP that the document would require updating in five-to-six-year intervals to adequately respond to changes in academic priorities, Capital Improvement Projects (CIP), enrollment, environmental issues, funding, changes in the UHM campus from construction of new buildings, and other major factors influencing the UHM campus development. This update was also necessitated by the CCH's requirement for a PRU approval prior to the issuance of building permits.

The last update to the UHM LRDP occurred in 2007. The purpose of the 2007 LRDP was to update the prior 1994 LRDP to reflect current and upcoming educational priorities. Future buildings, and projects, with emphasis given to the next 5-10 years (from 2007) were projected in the 2007 LRDP. The projected future buildings and projects fell into two categories:

1. Those that were on the CIP list and/or were anticipated for development within the next 5-10 years; and

2. Projects that were anticipated for development beyond the 5-10 year period.

The 2007 LRDP was ambitious with a total of 17 projects envisioned under Category 1 (constructed within 5-10 years) and another 17 projects envisioned under Category 2 (constructed beyond 10 years) (Group 70 International, 2007). Of the Category 1 projects, an addition of approximately 2,680,000 sf was permitted under the 2009 PRU permit based on the 2007 LRDP. However, since 2007, only six major projects along with some minor projects and temporary portable buildings have been constructed. In hindsight, the 2007 LRDP was too ambitious to be accomplished in 10 years, and realistically reflected a span of closer to 20 years.

With stabilization of the campus population and limited fiscal resources available for new facilities, the UHM has shifted its focus to deferred maintenance and renovations to modernize their existing campus. By repurposing and renovating their current facilities to accommodate a broader base of users and multiple disciplines, the UHM seeks to maximize the use of existing space and operate within the projected gross square footage set forth in the 2007 LRDP/2009 PRU.

In previous updates, the LRDP has functioned both as the UHM's overarching guiding document and priority list of near-term capital improvement projects to be included in the PRU. However, in light of the dynamic environment experienced by higher education institutions across the nation due to rapid technological, operational, and behavioral changes, and given the unpredictability of funding availability and sources for campus development, a more nimble and flexible long-term planning document, that goes beyond the five to ten-year time frame of the LRDP, was needed to guide the University in responsibly and sustainably meeting current and future demands. The need for a document solely purposed for long term planning, beyond the time frame of the LRDP, led to the development of the UH Mānoa Framework for the Future.

As such, the UHM has adopted a multi-pronged approach to campus planning that includes the following:

1. The UH Mānoa Framework for the Future Plan provides a long-term horizon of 20+ years that aligns campus development with the UHM's academic plans and goals for the future. The UH Mānoa Framework for the Future Plan serves to inform and direct future LRDP documents and PRU permits, which will identify key planning and development projects on the UHM for the coming years.

2. A streamlined LRDP with a 10-year planning horizon, that reflects the UHM's 6-Year CIP Plan and is supported by separate Tactical Implementation Plans (related to Energy Management, Campus Signage and Wayfinding, Campus Architecture and Design Review, and Space Standards).

3. A PRU permit document that incorporates information from the UH Mānoa Framework for the Future, the LRDP and supporting Tactical Plans along with additional information required by the City and County of Honolulu for the projects identified within the LRDP documentation.

1.2 UH Mānoa Framework for the Future Plan

The UH Mānoa Framework for the Future Plan incorporates the UHM's Strategic Plan, the UH Board of Regents 2017 Integrated Academic Facilities Plan, and Western Association of Schools and Colleges accreditation considerations into a flexible guide and structure for future campus development.

To align the long-term strategic guiding principles outlined in the framework plan with the physical UHM campus, planning objectives were identified to pinpoint the primary improvements and changes future UHM campus development must address. The planning objectives are:

1. Optimize infrastructure facility, land, and resource use
2. Transform circulation and mobility
3. Strengthen the gathering experience
4. Become a living and learning lab
5. Activate landscape and campus character
6. Provide for the campus ʻohana
7. Build resilience

The framework plan charts an overall structure for future campus building and development, new open spaces, infrastructure, and mobility networks, while allowing for flexibility to enable the UHM to respond to changing conditions and circumstances. In summary, the UH Mānoa Framework for the Future Plan will guide the UHM campus and LRDP towards:

- A reduction in square footage for core academic facilities and uses;
- Consolidation of core academic activities to the central part of campus (College of Education, Institute for Astronomy, UH Press, and Children's Center);
- Pedestrian Circulation which replaces vehicular traffic on the central part of campus;
- A greater student presence on campus in the afternoons and evenings;
- Flexible, space-efficient buildings;
- Additional student housing near campus, which reduces daily car trips;
- Revisioning the UHM Lower Campus around athletics and the Reserve Officers' Training Corps (ROTC) program, and aligning with the development efforts of Kamehameha Schools in the adjacent Mōʻiliʻili area; and
- Monetized ancillary site in alignment with campus needs (University Village, Faculty Housing, market driven mixed-use development efforts).

More information on the UH Mānoa Framework for the Future Plan may be viewed in its entirety at: https://www.manoaframeworkfuture.info

1.3 Project Location and Setting

Today, the approximate 308-acre UHM campus spreads throughout Mānoa Valley with approximately 9.4 million gross square feet (GSF) of built space. The main UHM campus occupies approximately 308 acres of land 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 side, Wa‘ahila Ridge on the Koko Head side, H-1 Freeway on the makai side and lower Mānoa and Mō‘ili‘ili and McCully residential communities on the ‘Ewa side. The LRDP Update would guide the physical UHM campus growth and development, which can be distilled into the four general regions listed as shown in Figure 1-1, and described in further detail below.

It should be noted that the Lyon Arboretum, which is located in the mauka-end of Mānoa Valley approximately 2.3 miles from the main UHM campus proper, is a UH research unit that is also considered to be part of the overall UHM campus. However, the Lyon Arboretum is not a part of the LRDP Update and will not be included as part of the forthcoming PRU Permit for the UHM LRDP Update and therefore is not included as part of the Project Area covered under this EA. The main UHM campus proper encompasses the following Tax Map Keys (TMK): 2-8-7: 29; 2-8-15: 1; 2-8-16: 1; 2-8-23: 3, 9-19; 2-8-26: 14; 2-8-29: 1, 30-34; 2-9-2: 12; 2-9-4: 5 & 7-10; 2-9-13: 54; 2-9-23: 1, 26; 2-9-26: 1 & 37-38; 2-9-27: 54; and 3-3-56: 1.

Lower (Makai) Campus

The Lower (Makai) Campus comprises approximately 93 acres of land. These properties are mauka of the H-1 Freeway, east of University Avenue, and makai of Dole Street. The immediate surrounding area includes a small residential neighborhood and the Puck’s Alley retail complex to the south, residential neighborhood and Kānewai Community Park to the east, and a residential neighborhood with some commercial development to the west (See Figure 1-2).

The Lower Campus generally consists of the UHM’s athletic facilities and programs, the UHM’s main undergraduate dormitories for student housing, parking structures, and various UHM academic programs. Specially, the Lower Campus includes the following facilities presented in Table 1-1:

Table 1-1 Existing Lower Campus Facilities

Facility	Gross Square Feet	Notes
The SimpliFi Arena at Stan Sheriff Center	190,000	A 10,300-seat multipurpose arena which is the home for the UHM volleyball and basketball programs.
The Duke Kahanamoku Aquatic Complex	36,125	The home of the UHM swimming & diving teams and the water polo team, which includes a 50-meter and 25-yard pool.
The Les Murakami Stadium	81,244	A 4,312-seat stadium that is the home of the UHM Baseball team.

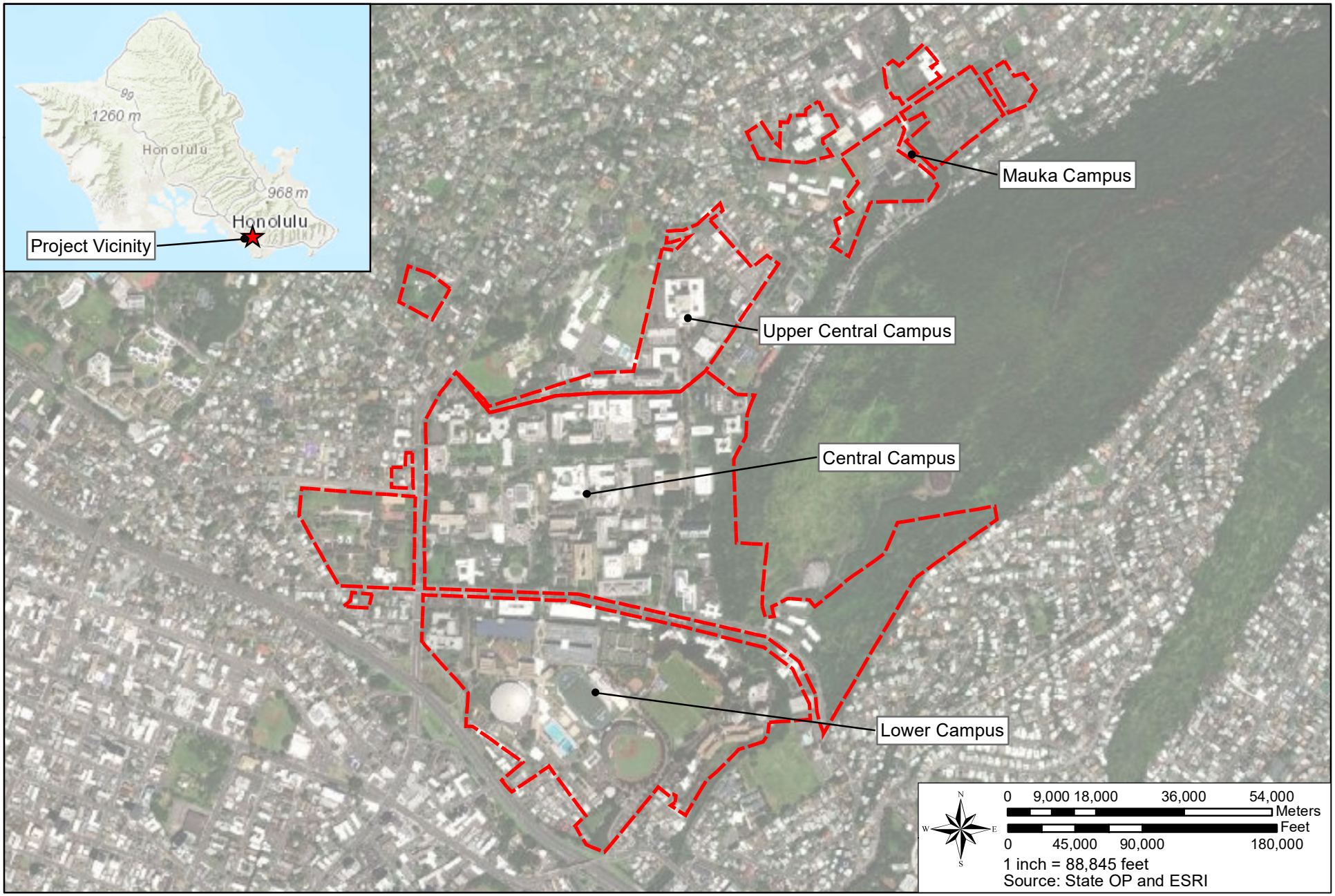


FIGURE 1-1

PROJECT LOCATION MAP

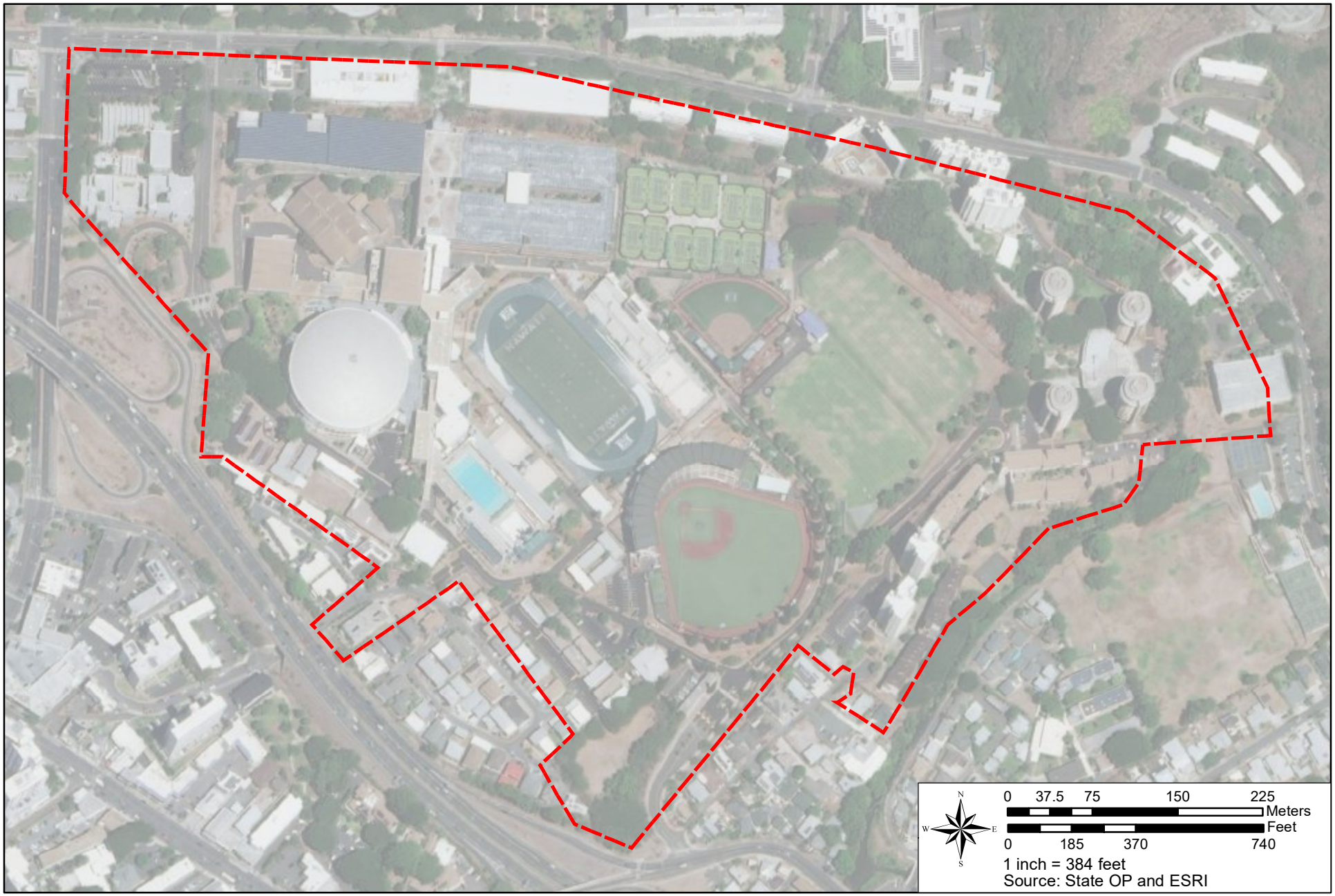


FIGURE 1-2

LOWER CAMPUS MAP

Table 1-1 Existing Lower Campus Facilities		
Facility	**Gross Square Feet**	**Notes**
The Clarence T.C. Ching Athletic Complex	47,788	Includes a three-story building on the mauka side of the field that houses offices, locker rooms, meeting rooms, supports a wide variety of activities and events as the only on-campus all-purpose track and field, football, soccer, beach volleyball and recreational facility, and is the temporary home for the UHM Football team.
The Rainbow Wāhine Softball Stadium	20,000	A 1,200-seat stadium that is the home for the UHM Softball team
The UH Tennis Complex	N/A	The home for the UHM Tennis team, features 12 asphalt courts with lights and bleacher seating.
The Cooke Practice Field	N/A	Large open space area that the various athletic programs use to practice on.
The Otto Klum Gymnasium	29,715	Used by many sports teams and extra-curricular activities.
The Physical Education/Athletic Complex	176,559	Provides offices and classrooms for the Kinesiology and Rehabilitation Science program, athletic programs, and student recreation services at UH, as well as two gymnasiums for sports teams and extracurricular activities.
The Music Complex	72,509	The home for the UHM Music Department and includes the Orvis Auditorium.
The William S. Richardson School of Law Building and Law Library	94,671	The home for the UHM Law program.
Johnson Hall	49,751	Comprised of two adjoining three-story buildings, housing approximately 191 undergraduate upperclassmen.
Gateway House	75,283	Includes two 10-story towers, housing approximately 208 undergraduate upperclassmen.
Frear Hall	193,609	Comprised of 12 floors split into two wings with 20 suites per floor, housing approximately 810 undergraduate upperclassmen.
The Hale Aloha Lehua, 'Ilima,	305,267	Includes four 13-story towers,

Table 1-1 Existing Lower Campus Facilities		
Facility	**Gross Square Feet**	**Notes**
Lokelani, and Mokihana Towers and Hale Aloha Cafeteria		providing housing for approximately 1,040 first year UHM students.
The Hale Noelani Apartment Complex	140,200	Consists of five three-story building, providing housing for approximately 524 undergraduate upperclassmen
The Hale Wainani Apartment Complex	163,612	Consists of two 14-story towers and two three-story buildings, providing housing for approximately 650 undergraduate upperclassmen and graduate students
Hale Ānuenue	19,631	Consists of three stories, providing UHM students with individual living options and houses approximately 41 students.
The Kamakakūokalani Center for Hawaiian Studies	31,809	Includes offices and classrooms for students in the Hawai‘inuiākea School for Hawaiian Knowledge as well as the Ka Papa Lo‘i O Kānewai Cultural Garden
Army ROTC Building	5,178	The current home for the UHM Army ROTC program.
Zone 2- Fiscal Management Annex Portable Buildings	52,400	Offices for Fiscal Management employees.
The Lower Campus Parking Structure	1,149,555	Provides approximately 2,810 parking stalls
The Dole Street Parking Structure	89,104	Provides approximately 272 parking stalls

A large portion of the Lower Campus was the former site of the Mō‘ili‘ili Quarry that mined the area for construction materials until operations ceased in 1950 and was acquired by the UH in 1953. The former quarry walls are still present and separate portions of Lower Campus. Within the former quarry are the athletic facilities and complex, while at the upper elevations above the quarry walls are the student dormitories. The facilities within the quarry are accessible by Lower Campus Road, via Dole Street, Old Waialae Road, and the H-1 Freeway, and has a network of smaller roads and driveways leading to the various facilities. The facilities above the quarry can be accessed from Dole Street. It should be noted that Lower Campus also includes a portion of Mānoa Stream, which irrigates the Ka Papa Lo‘i O Kānewai Cultural Garden, that traverses through it, and also has a “pond” situated near the Cooke Practice Field and Rainbow Wāhine Softball Stadium, which is fed by a natural spring. More details regarding the existing environmental conditions are provided in Chapter 3 of this EA.

Central Campus

Central Campus includes the central core of the UHM campus proper and is comprised of approximately 167 acres of land. The Central Campus boundary includes Dole Street to the

south, Mid-Pacific Institute and portions of the Upper Central Campus to the north, Mānoa Stream and portions of Waahila Ridge to the east. The Central Campus also includes properties located west of University Avenue which comprises an approximate 20-acre area of four non-contiguous properties which includes the College of Education, UH Community College offices, the former Atherton YMCA property, and College Hill. A 2.21-acre parcel, which was once under the ownership of the U.S Government and used as a research facility by the National Oceanic and Atmospheric Administration (NOAA) was added to the UHM inventory and included as part of the LRDP Update (See Figure 1-3). Generally, Central Campus provides majority of the facilities for the various academic programs at UHM as well as facilities that enhance the campus life and student experience at UHM, and some faculty and student housing facilities. Specifically, the Central Campus includes the following facilities presented in Table 1-2:

Table 1-2 Existing Central Campus Facilities

Facility	Gross Square Feet	Notes
The Waʻahila Faculty Housing Complex	80,480	Includes five three-story buildings which provides a variety of housing options for UH faculty and staff members
The site for the Mixed-Use Housing P3 Project (NOAA Property)	N/A	More fully described in Section 2.2.4.1 of this EA
John A. Burns Hall	144,600	Houses the East-West Center’s program rooms, administrative offices, and art gallery
Hale Hālāwai	1,500	A facility a part of the East-West Center’s campus
Hale Mānoa	N/A	The main dormitory for the East-West Center’s international residential community of students and professional associates
Hawaiʻi Imin International Conference Center at Jefferson Hall	N/A	The main conference center for the East-West Center with meeting rooms, dining rooms, and a reading lounge
The Jakuan Teahouse and Japanese Garden	799	Promotes the East-West Center’s goal to foster a deeper awareness of Japanese culture and international understanding
Hale Kuahine	N/A	Houses the East-West Center’s international residential community of graduate students and professional participants

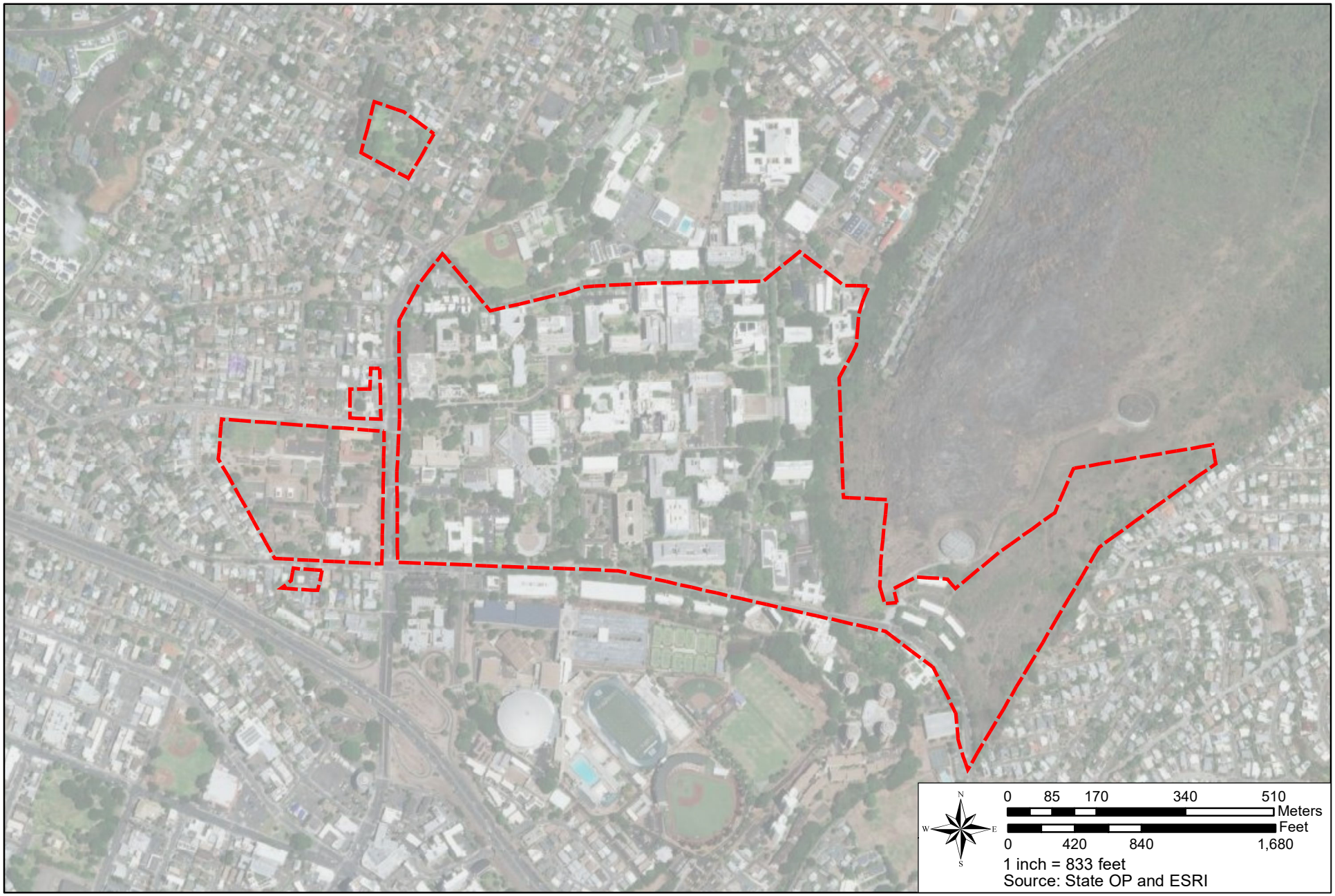


FIGURE 1-3

CENTRAL CAMPUS MAP

Table 1-2 Existing Central Campus Facilities		
Facility	**Gross Square Feet**	**Notes**
Lincoln Hall	48,756	Houses visitors, professional participants, and conference attendees associated with the East-West Center
Holmes Hall	227,426	The home for the College of Engineering at the UHM
The Pacific Ocean Science and Technology Building	246,683	An eight-story building that houses the School of Ocean and Earth Science and Technology at UHM.
Sakamaki Hall	101,436	A four-story building providing classrooms and offices
Krauss Hall	11,253	A single-story building with a courtyard, and the former site of the Pineapple Research Institute
Zone 1-Administrative Zone Annex Portable Buildings	21,700	Offices for administrative services' employees
Lincoln Hall Annex Portable Buildings	18,405	Office and support facilities for Lincoln Hall
The Andrews Outdoor Theatre	10,800	Seats approximately 5,500 people and can host a wide variety of events.
Bachman Hall	33,381	Houses UHM administration including Offices of the President and Board of Regents
The Dole Street Offices	8,326	Houses the UH Community Colleges System staff
The University Laboratory School	57,747	A charter school operating in close partnership with the UH College of Education, serving as a laboratory for researching, developing, evaluating innovative approaches to improving teaching and learning
Castle Memorial Hall	34,430	Home for the College of Education at the UHM
Wist Hall	27,445	Facility used by the College of Education at the UHM.
Everly Hall	20,583	An extension of the College of Education at the UHM
The former Atherton YMCA property and site for the UHM Innovation Center & Residences For Innovation Student Entrepreneurs P3 Project	N/A	Described in Section 2.2.4.2 of this EA
Sinclair Library	116,353	A four-story library that is slated for renovation
Hemenway Hall	36,698	One of the first student-centered

Table 1-2 Existing Central Campus Facilities		
Facility	**Gross Square Feet**	**Notes**
		facilities that house several programs and extracurriculars
Administrative Services Buildings 1 & 2	23,192	Houses various UHM services
Campus Center	121,000	Houses the University Bookstore, conference rooms, dining halls, restaurants, music room, and art gallery for university and community use
The Warrior Recreation Center	66,000	A two-story recreational center considered to be one of the best in the State
Miller Hall	18,933	Houses classrooms and offices
The Art Building	138,683	Includes an art gallery, houses the Department of Art & Art History
Building 37 – iLab	3,923	Home to the UHM’s state-of-the-art innovation lab
Kuykendall Hall	91,456	One of the primary facilities on campus for delivering undergraduate education and is the home to the UHM English Department
Bilger Hall and the Bilger Addition	161,462	Home to the UHM chemistry laboratories and classrooms
Information Technology (IT) Center	73,981	Consolidates IT administration, operations, and support infrastructure
The Hawai‘i Institute of Geophysics	127,907	Home to the Hawai‘i National Weather Service Forecast Office, UH Sea Grant Program, and the Department of Atmospheric Sciences
Keller Hall	51,309	Primarily used by the UHM Mathematics and Computer Science Department
The Physical Science Building	46,093	Houses classrooms and offices
Watanabe Hall	66,814	Houses the Department of Physics and Astronomy
The Marine Sciences Building	100,364	A six-story building with offices, laboratories, and two auditorium type classrooms
The University Health Services Building	12,339	Offers a range of medical services and programs
The Kennedy Theatre	61,441	Home for the productions of the UHM Department of Theatre + Dance
Hale Kahawai	37,578	A four-story dormitory that houses approximately 156 undergraduate upperclassmen residents

Table 1-2 Existing Central Campus Facilities		
Facility	**Gross Square Feet**	**Notes**
Hale Laulima	38,446	A four-story dormitory that houses approximately 160 undergraduate upperclassmen residents
The Center For Korean Studies	14,622	The educational, research, and informational hub for Korean Studies in the U.S.
Moore Hall	117,839	A two-wing (four- and five-story wings) building that has offices and classrooms
The Life Sciences Building	95,090	Houses the School of Life Sciences along with the Pacific Biosciences Research Center, features teaching labs, research labs, collaboration space, conference rooms and offices
The Paradise Palms Café	13,400	A food court facility that features six food vendors, dining room, and outdoor eating area
The Hamilton Library and Hamilton Library Addition	414,876	The main research library for the UH and provides a world class collection related to Hawai'i, Oceania, and the Pacific Islands, as well as China, Japan, Korea, Okinawa, the Philippines, Russia, South Asia, and Southeast Asia with more than 3.2 million print volumes, as well as archives and manuscripts, maps, rare books, audiovisuals, art, and millions of digital resources
Edmondson Hall	45,833	The home for the Biology Department
Spalding Hall	35,530	Provides classrooms and offices
Webster Hall	62,264	Provides classrooms and houses the School of Nursing and Dental Hygiene
The Queen Lili'uokalani Center For Student Services	121,171	Provides various services and programs for the UHM community
Saunders Hall	136,162	A seven-story building with classrooms and offices
Hawai'i Hall	40,699	The UHM's first permanent building housing administration operations
Dean Hall	19,785	Houses the Anthropology and Biology Departments
Crawford Hall	27,660	Provides classrooms and offices
Gartley Hall	25,503	Houses School of Social Work
The Architecture Building	65,946	Houses the School of Architecture
George Hall	52,304	Provides classrooms and office

Table 1-2 Existing Central Campus Facilities		
Facility	**Gross Square Feet**	**Notes**
		spaces
The Business Administration Building	122,052	Home for Shidler College of Business at UHM
College Hill	7,194	The UHM's President's home

Due to the majority of the facilities for the various academic programs at UHM as well as facilities that enhance the campus life and student experience at UHM being located on the Central Campus, it is also characterized by many pedestrian paths, open parking lots, open spaces, art, unique landscaping, and significant trees. More details regarding the existing environmental conditions are provided in Chapter 3 of this EA.

Upper Central Campus

This area comprises approximately 22 acres of land mauka of Maile Way, and is bordered by Mid-Pacific Institute to the north and west, the former St. Francis School to the east, and adjacent to Pamoa Road to the northeast (See Figure 1-4). Generally, the Upper Central Campus is comprised of facilities for some of the academic programs at UHM as well as facilities for other administrative and support services at the UHM. Specifically, the Upper Central Campus includes the following facilities presented in Table 1-3:

Table 1-3 Existing Upper Central Campus Facilities		
Facility	**Gross Square Feet**	**Notes**
Maile Way Building 2 COPF-BGM Office	1,525	Office space
Gilmore Hall	77,071	Houses the UHM College of Tropical Agriculture and Human Resources (CTAHR)
The Agricultural Engineering Institute	15,116	Home to the UHM Molecular Bio Science and Bio Engineering Departments and has seven state of the art laboratories
The St. John Plant Science Laboratory 1 & 2	145,487	Houses the botany department at UHM
Sherman Laboratory	48,790	Houses departments under the CTAHR
Dance Building	7,523	Used for dance classes and practice
The UH Cancer Center Freezer Facility	1,566	Used to assist in cancer research at the UHM
The Pope Laboratory	24,138	Another facility with laboratories

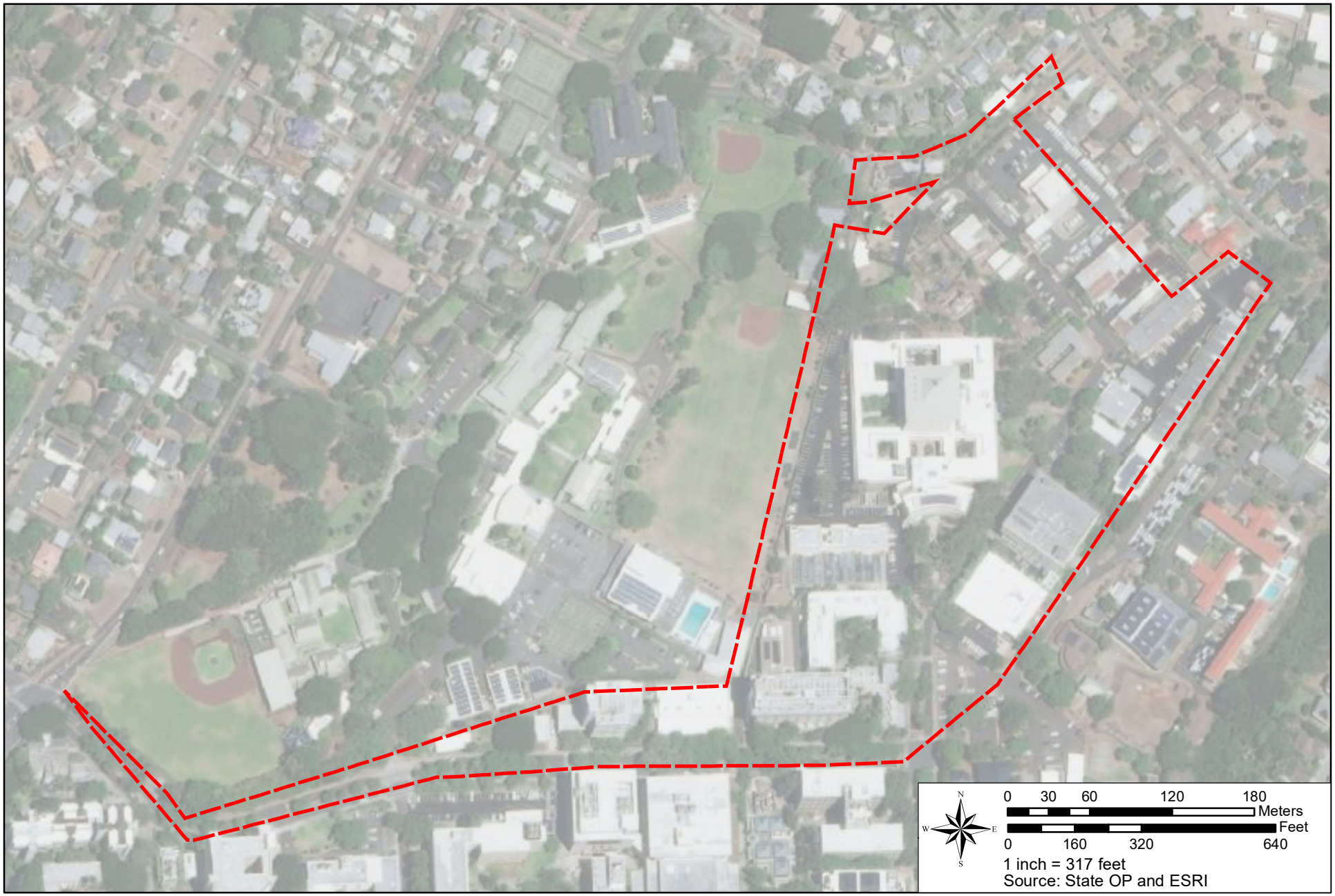


FIGURE 1-4

UPPER CENTRAL CAMPUS MAP

Table 1-3 Existing Upper Central Campus Facilities		
Facility	**Gross Square Feet**	**Notes**
The Campus Services Building	25,448	Houses the UHM Department of Public Safety, Commuter Services, University Housing, and Food Services
The Agricultural Science Building	93,591	Home to many natural science programs at the UHM
The Daniel K. Inouye Center for Microbial Oceanography: Research and Education Building	32,126	Designed to facilitate a more comprehensive understanding of the biological and ecological diversity of marine micro-organisms
The Biomedical Sciences Building	195,043	Built to provide a complete medical school at the UHM
Pacific Biosciences Research Center (PBRC)	15,834	A center of excellence in interdisciplinary biological sciences, with its research, training, and outreach activities focused on the unique opportunities found in Hawai'i and throughout the Pacific Islands
The Biophysics Lab – Warehouse Facility	8,818	Serves the PBRC institute
The Maintenance Warehouse (Hale Ukana)	25,712	Provides storage and a space to maintain various equipment used at the UHM
Physical Plant Building	4,881	Provides additional office space.
The Physical Plant Building 1 & 2	3,921	Additional support facilities to the Physical Plant Building
The Pāmoa Building A – OSI / OPD	2,045	Home to the Office of Systems Integration Business Process Transformation Unit, and parts of the Office of Sustainability and Office of Project Delivery Departments at the UHM
Pāmoa Building B & C	4,059	Support facilities to the main Pāmoa Building
Maintenance Shops	26,671	Provides storage and a space to maintain various equipment used at the UHM
Ground Maintenance Services Building	3,434	Houses over 200 employees that assist the UHM in cleaning and beatifying the campus
Mālama 1-4	3,456	Environmental Health and Safety Office and Dive Safety offices
Transportation Services Buildings	8,665	An office, a pre-fab Building to support the Transportation Services

Table 1-3 Existing Upper Central Campus Facilities		
Facility	**Gross Square Feet**	**Notes**
		Department at UHM, auto maintenance/storage to support the Transportation Services Department at UHM, a covered extension work area to support the Transportation Services Department at UHM, and a service station with gas pumps.
Environmental Protection Facility Building	3,593	Dedicated to the protection from fire, radiation, occupational safety, hazardous materials and other for the UHM
Cottage 2 – CC Facilities / WCC Thrift Shop	3,573	
Energy House	1,881	Includes a water catchment system for irrigating a food-producing garden, a solar water heater to reduce dependence on electricity, and natural lighting and ventilation so that the need for electricity for air conditioning and lighting would be eliminated or minimized

More details regarding the existing environmental conditions are provided in Chapter 3 of this EA.

Mauka Campus

The Mauka Campus (also referred to as the Magoon Campus) comprises dis-contiguous properties located mauka of the UHM main campus area (See Figure 1-5). There are seven TMKs, which encompass approximately 28 acres, and comprise the Mauka Campus that border or are in proximity to Woodlawn Drive. Generally, the Mauka Campus consists of primarily faculty housing, academic research facilities, and other support facilities for UHM academic programs. Specifically, the Mauka Campus includes the following facilities presented in Table 1-4:

Table 1-4 Existing Mauka Campus Facilities		
Facility	**Gross Square Feet**	**Notes**
Woodlawn 1-7	10,313	Includes facilities for associated editorial, marketing, journals, administration, production, and business services at UHM
Woodlawn H	1,859	
Institute For Astronomy – Laboratory and Offices	31,882	Provides lab research space for the Institute of Astronomy

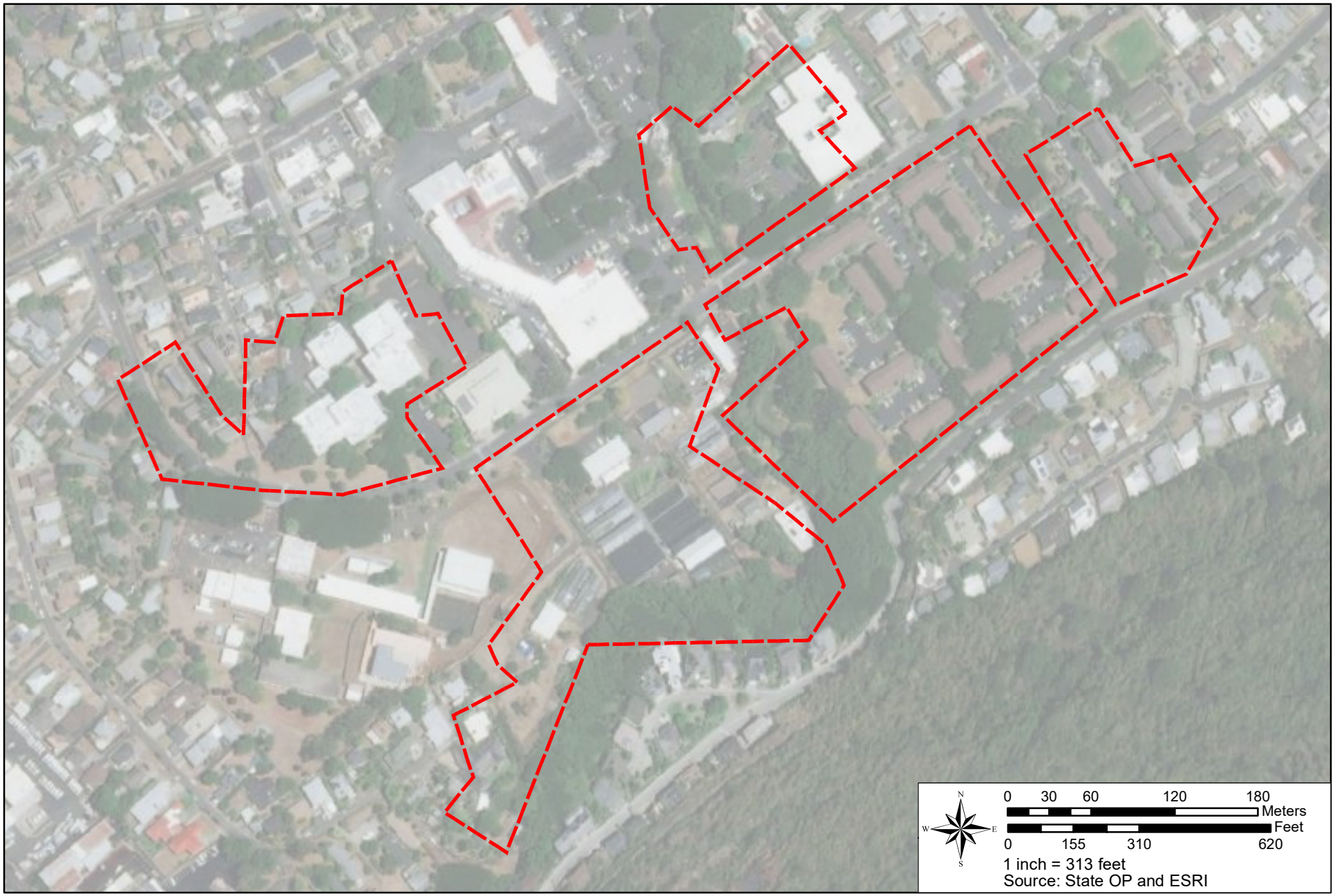


FIGURE 1-5

MAUKA CAMPUS MAP

Table 1-4 Existing Mauka Campus Facilities		
Facility	**Gross Square Feet**	**Notes**
Institute For Astronomy – Administration	30,143	Home for the institute of Astronomy
Institute For Astronomy – Machine Shop	8,695	Building used to assist lab projects for the Institute of Astronomy
The Mānoa Innovation Center	N/A	Serves as an incubation space for new and early-stage technology companies
The Magoon Soil Laboratory – NREM	4,673	Provides laboratory space to host a variety of projects at UHM
Magoon Greenhouses 1 through 12	39,874	Provide spaces for students in the Tropical Plan and Soil Sciences (TPSS) program at the UHM learn how to manage land, water, crops, and agricultural systems
The Magoon Field Laboratory – PEPS	1,829	The home of the Plant and Environment Protection program at UHM
The Magoon Headhouse	4,749	A support facility for the TPSS program
The Small Animal Care Facility	5,174	
Hale Tuahine	2,619	Used to provide outreach programs to high school students regarding agricultural systems
Kauʻiokahaloa Nui Apartment Complex Buildings A through Q	140,876	provides housing for UHM Faculty
The Kauʻiokahaloa Nui Managers Office	5,107	Provides management support to the overall complex
The Kauʻiokahaloa Iki Apartment Complex Buildings 1-6 and DH	44,032	Provides housing for UHM Faculty

1.4 Surrounding Uses

The main UHM campus occupies approximately 308 acres of land in lower Mānoa Valley, bounded by the Mānoa, St. Louis Heights, Mōʻiliʻili and McCully communities. Its principal physical borders are the Mānoa residential community on the mauka side, Waʻahila Ridge on the Koko Head side, H-1 Freeway on the makai side and lower Mānoa and McCully residential communities on the ‘Ewa side.

There are several public and private schools in the vicinity of the UHM. Mid-Pacific Institute borders the Project Site to the north. Punahou School is located approximately 0.5 miles to the west of the Project Site. Maryknoll is located approximately 0.75 to the west miles from the Project Site, and is adjacent to Punahou School. Saint Louis School and Chaminade University of Honolulu share a campus, and are located approximately 0.5 miles to the east.

There are also several elementary and middle schools within the region (See Figure 1-6). Puck’s Alley is located to the south of the Campus, just down University Avenue across the H-1 Freeway. Puck's Alley is a neighborhood center owned and operated by Kamehameha Schools that features approximately 52,000 square feet of ground floor retail space with office space above. Puck's Alley offers a unique blend of experiences from dining, shopping for apparel, hair and nail salon services, and other retail shops at this convenient location. There is ample free customer parking, and the center is within walking distance from the UHM.

1.5 Land Ownership

The State of Hawai‘i - University of Hawai‘i System (per Executive Order 1807 to the Board of Regents of the UH) holds title to the land under the location of the Proposed Action.

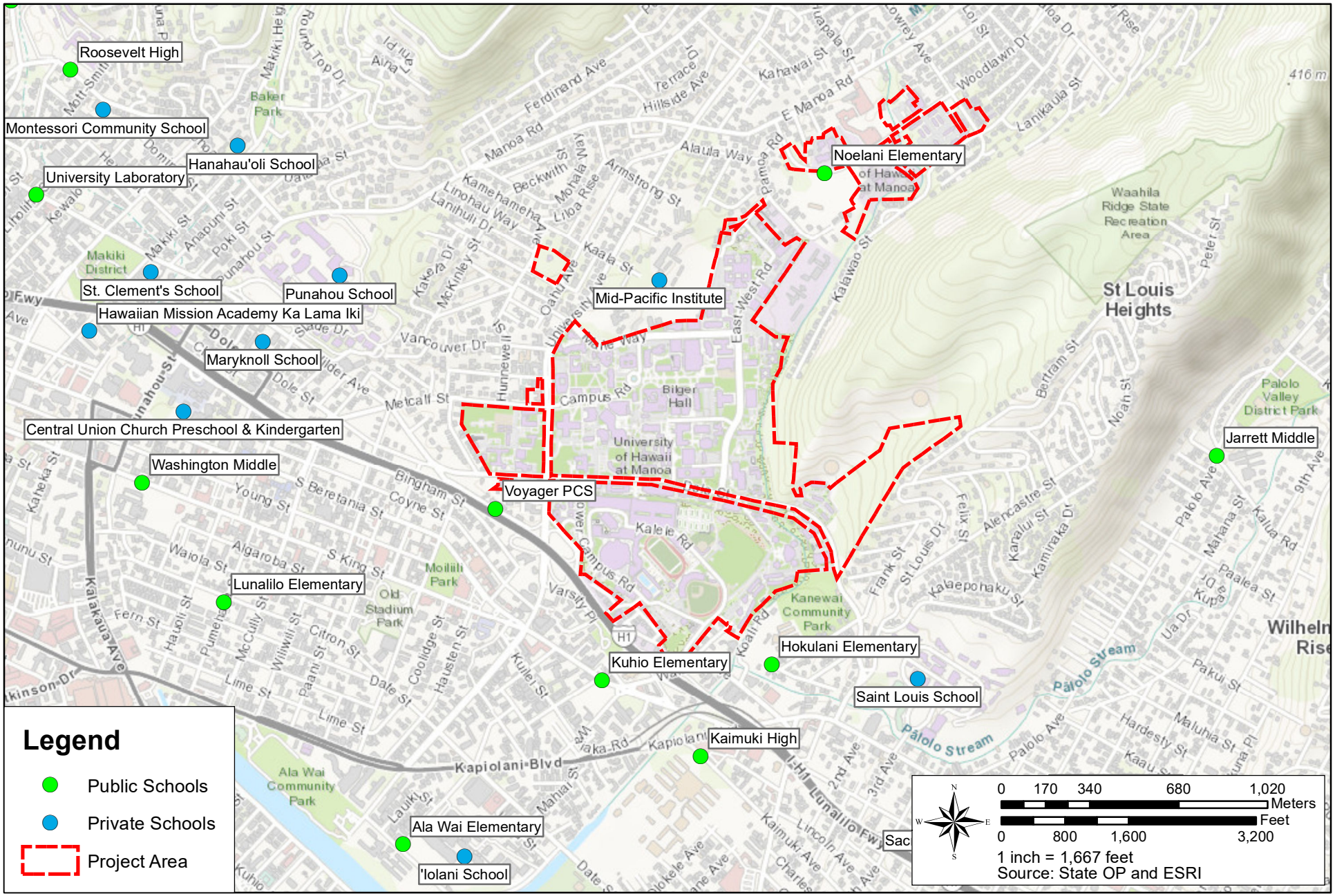


FIGURE 1-6

REGIONAL SCHOOLS MAP

Chapter 2:

Project Description

CHAPTER 2: PROJECT DESCRIPTION

2. PROJECT DESCRIPTION

2.1 PURPOSE AND NEED

As discussed in Section 1.1, with the stabilization of the UHM campus population and limited fiscal resources / funding sources available for the development of new facilities, the UHM has shifted its focus to facility optimization and reduction of deferred maintenance and right-sized renovations to modernize the existing UHM campus. By repurposing and renovating their current facilities to accommodate a broader base of users and multiple disciplines, the UHM seeks to maximize and optimize the use of existing space and operate within the projected gross square footage set forth in the 2007 LRDP/2009 PRU (approximately 2,680,000 SF).

As articulated in the 2019 LRDP, in order to optimize campus-wide capital expenditures, long-term deferred maintenance budgets, operating expenses, and energy costs; the UH Board of Regents established a goal to reduce approximately 1 million SF from the overall UHM facility inventory. The UH intends to meet this facility space goal through improvements in facility utilization, application of appropriate space standards, removal of inefficient and aging facilities, adoption of virtualization, and rightsizing / modernizing existing facilities.

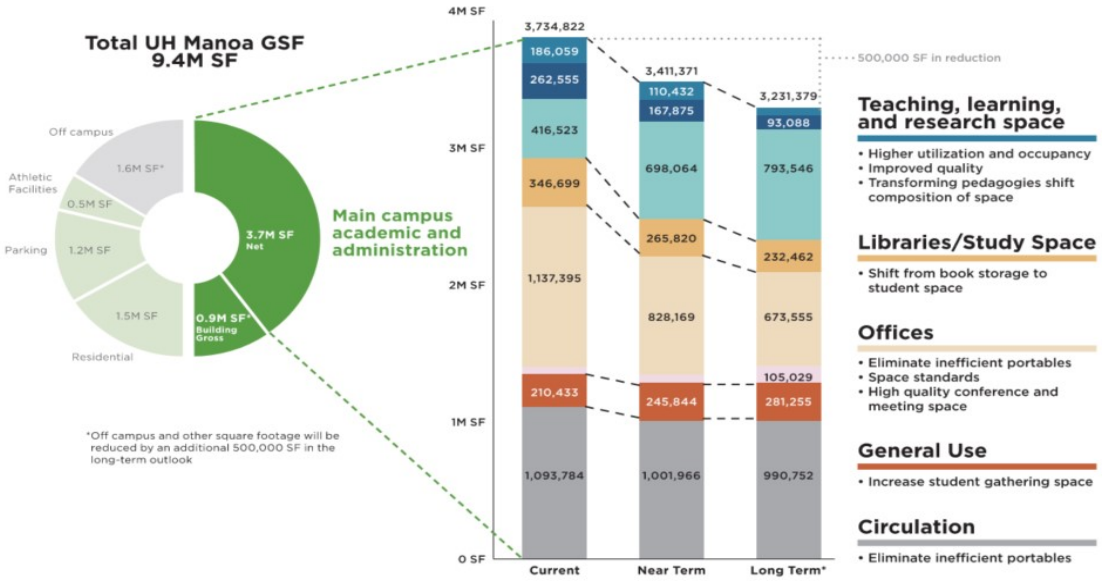
While existing campus space inventory allows the UHM to serve current facility demands, there is an opportunity to align campus spaces more closely with the core values and mission of the UH, as well as the evolving nature and needs of higher education from an operational standpoint. Core to these values is the ability to adapt to emerging research and instructional trends and technologies, to ensure that the campus improves as a physical environment for student, faculty, staff, and community interaction. As mentioned in Section 1.2, to align the long-term strategic guiding principles outlined in the UH Mānoa Framework for the Future Plan with the physical UHM campus, goals and objectives were identified to pinpoint the primary improvements and changes future UHM campus development must address. The goals and objectives are:

1. Optimize infrastructure facility, land, and resource use
2. Transform circulation and mobility
3. Strengthen the gathering experience
4. Become a living and learning lab
5. Activate landscape and campus character
6. Provide for the campus ʻohana
7. Build resilience

Optimize Infrastructure Facility, Land, and Resource Use
The UH intends to organize campus space and investments to optimize utility, density, and economic performance by improving building utilization and occupancy; improving the overall facility portfolio effectiveness; create land banks for future use, such as research and development (R+D) or Play Innovation Spaces; develop a long-term strategic energy management plan; and pursue revenue-generating developments and partnerships.

The UH intends to reduce the total square footage by improving utilization and occupancy rates, increase space utilization and efficiency of class scheduling; increase the amount of collaborative space for meetings, study, or recreational activities to enhance on-campus life and the student experience; enhance the quality and quantity of research space; improve circulation efficiency; decrease reliance on portables; and reduce deferred maintenance (See Figure 2-1).

Figure 2-1 Future Space Allocations



**Source: UH Mānoa Framework for the Future by MKThink*

The UH also intends to improve the overall effectiveness of the UHM facility portfolio by developing / retrofitting larger, more efficient buildings; having higher density and more open space by concentrating academic activity on Central Campus; improving building occupancy and utilization by making building repairs and identifying buildings that need to be removed from the campus inventory; removing underutilized portables; and creating land banks for a range of future uses such as housing, R&D spaces, and open space plazas.

Transform Circulation and Mobility

The UHM is striving to transform from a commuter campus to a pedestrian-focused place of learning. To achieve this goal, the UHM intends to reduce parking inventory; prioritize pedestrian pathways and wayfinding on the Central Campus; develop alternative transit solutions to one-driver-one-car such as a transit hub, developing an off-campus parking strategy, and anticipating future mobility changes; and create velocity-based on-campus hierarchy of circulation.

In the near-term, this will involve relocating parking and vehicular circulation from the core of the central campus to the periphery. In the long term, the University will develop, promote, and support alternatives to commuting via private vehicles, which may include ridesharing, enhanced public transit, an expanded UHM shuttle system, human-powered and motorized

bicycles and scooters, autonomous vehicles, and the possible extension of rail to the UHM campus.

Strengthen The Gathering Experience

The UH intends to create vibrant gathering spaces that can be the foundation of the UHM campus development. This includes supporting gathering spaces at all scales – formal and informal, and indoor and outdoor. Also envisioned is embedding digital capabilities (digital learning) into the gathering space experience including but not limited to, Wifi, digital screens, and dynamic lighting; and integrating international connections by hosting international gathering events, as well as integrating the local community into campus learning and cultural events.

Pathways are envisioned as two-fold, creating compelling public spaces for gathering and spontaneous interactions. Gathering spaces are designed to be flexible, serving multiple programmatic uses & demographics.

Become A Living and Learning Lab

The UHM intends to establish and develop its campus as a center for scalable research and experiential learning. This includes addressing the long term need for research facilities; incorporating the campus landscape as part of experimentation, learning and the creation of new knowledge; modeling best practices for mālama ‘āina; and providing high quality, flexible research environments.

The UHM’s goal of promoting world-class instruction and scholarship is embodied in its perennial recognition as a top-ranked research institution. To remain a top-ranked research institution, the UHM seeks to retain current faculty and attract new faculty and researchers by adding more research space and ensuring distribution of space and facilities is similar to the competing field of other research institutions.

Activate Landscape and Campus Character

Given that the landscape of the UHM Campus is one of its most valuable and distinctive attributes, the UHM’s goal is to celebrate its unique natural assets and reduce impervious surfaces. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources.

Provide For The Campus ʻOhana

The 2017 Campus Experience Survey found that residential experiences were high on the list of factors that influence students’ perspectives of the campus. Thus, the UHM’s goal is to create a living campus that supports community and student well-being. This will include services for students, staff, and faculty as well as members of the local community, and a long-term emphasis on encouraging development of student and faculty housing on and near campus. Leveraging the UHM campus as a program opportunity would allow the UH to invest in the quality of campus life and citizenship which also means investing in a range of

recreation opportunities including everything from the lo'i space, athletic fields, to hiking trails and outdoor eating spaces. Creating key areas and zones that serve the wider public as well as the immediate campus community will serve to heighten regional appreciation and awareness of UHM's research pursuits and increase the UH's civic value for decades to come

Build Resilience

The UHM seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations.

2.2 PROPOSED ACTION: LONG RANGE DEVELOPMENT PLAN UPDATE

In light of the UH Mānoa Framework for the Future Plan's comprehensive and long-term nature, planning objectives, as juxtaposed with the UHM's overall goals and objectives, the 2019 LRDP Update focuses on defining nearer term, tactical projects that are consistent with the UH Mānoa Framework for the Future Plan (Proposed Action). The Proposed Action represent the UHM's current highest and best use of funds in service of the UHM's goals and objectives and serve as the basis for capital project budgeting and optimizing the UHM campus.

The Proposed Action will not result in a large net increase in SF overall, as the Proposed Action is envisioned to make more efficient use of the space available on the UHM campus. Some of the new buildings proposed involve replacement of the existing building stock and demolition of portable buildings (once new and replacement buildings are constructed).

Each project includes design and density considerations around which project funding, design, and construction procurement can be implemented within the context of the overall UH Mānoa Framework for the Future Plan. These criteria include anticipated building heights and approximate building footprint as well as landscape and architectural design considerations. Each project identified was selected because of its overall contribution to the UHM campus in general as well as to its ability to comply with the various criteria and range of needs established within the UH Mānoa Framework for the Future Plan as discussed in Section 2.1 above.

The projects envisioned under the Proposed Action reflect the previously outlined goals of improving quality of academic space, reducing overall campus square footage, improvements to circulation efficiency, decreased reliance on portables and creating a sustainable energy program that is realistically feasible. These projects are listed, as well as categorized below and depicted in Figure 2-2. While specific projects are identified within the LRDP and assessed in this EA, the UHM has been working with DPP on streamlining the PRU process to better reflect the unique characteristics, challenges and uncertainties which public colleges and universities often face. While the effort is on-going, current thoughts include the use of a broad set of development standards envelopes that regulate uses, densities, heights, lot coverage, maximum floor areas and setback requirements.

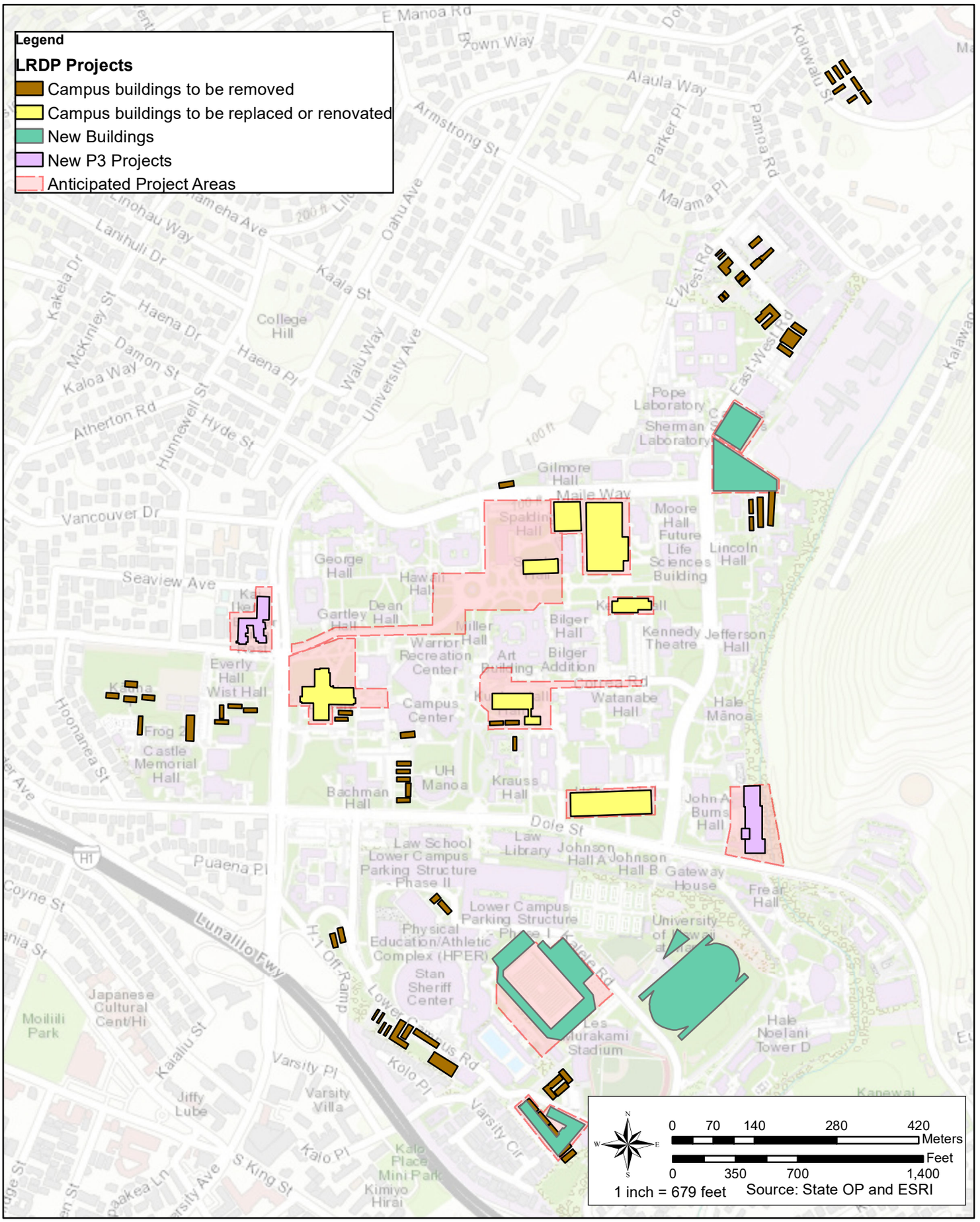


FIGURE 2-2

LRDP PROJECTS MAP

UNIVERSITY OF HAWAI'I AT MĀNOA LONG RANGE DEVELOPMENT PLAN

WILSON OKAMOTO CORPORATION

As such, while specific building locations and heights are included in the LRDP for planning purposes, the PRU seeks to explore a development envelope or envelopes with established standards within which new buildings and developments are permitted. In addition, to minimize potential impacts to adjacent communities and land uses, additional requirements will be established for developments situated near the edge of the UHM campus.

2.2.1 New Construction/Replacement of Existing Structures (Net Increase) Projects

This category of LRDP projects includes the construction of new buildings and structures on undeveloped vacant land or underdeveloped sites such as a parking lot. This category also includes the replacement and reconstruction of existing structures located at the same site, but with substantial change in use, increase in capacity, density, height, and dimensions. The New Construction/Replacement of Existing Structures (Net Increase) Projects are discussed further below in the subsequent subsections.

2.2.1.1 Central Traffic Center and Parking Structure

The UHM is fostering a multi-modal approach to address future parking and mobility on the campus. As a part of this initiative, the UHM is proposing to construct the Central Traffic Center that is intended to be a multi-level parking structure situated along East-West Road on the Upper Central Campus portion of the UHM campus, adjacent to the Center for Korean Studies (See Figure 2-3). Currently, the project site for the Central Traffic Center is a surface parking lot identified as Zone 4. The Central Traffic Center will help reduce the reliance on street parking and offset surface parking that is proposed to be removed from Correa Road, Varney Circle, and several other surface lots dispersed throughout the UHM campus. Construction is anticipated to occur in two phases commencing between 2022-2025:

- Phase 1: Six stories located at the Maile/East-West Road intersection (approximately 1,000 parking stalls)
- Phase 2: Six stories located adjacent to the Phase 1 development (approximately 500 parking stalls)

2.2.1.2 Central Administration Facility

Currently, administrative offices are distributed throughout the entire UHM campus. This Central Administration Facility will consolidate most of these administrative offices into one building. The project site for the Central Administration Facility is planned to be adjacent to the proposed Central Traffic Center site, at the intersection of East-West Road and Maile Way (See Figure 2-4). Currently, the project site is occupied by the existing Campus Services building which houses the UHM Department of Public Safety, Commuter Services, University Housing, and Food Services. The Central Administration Facility will increase the project site square footage to approximately 55,000 square feet (SF) and will not exceed six floors in height. Overall, this project will yield in an overall net reduction in square footage on the UHM campus as several existing portable buildings will be demolished through the Temporary Building Demolition Program described further below in Section 2.2.2 in efforts to consolidate uses and make more efficient use of campus space.

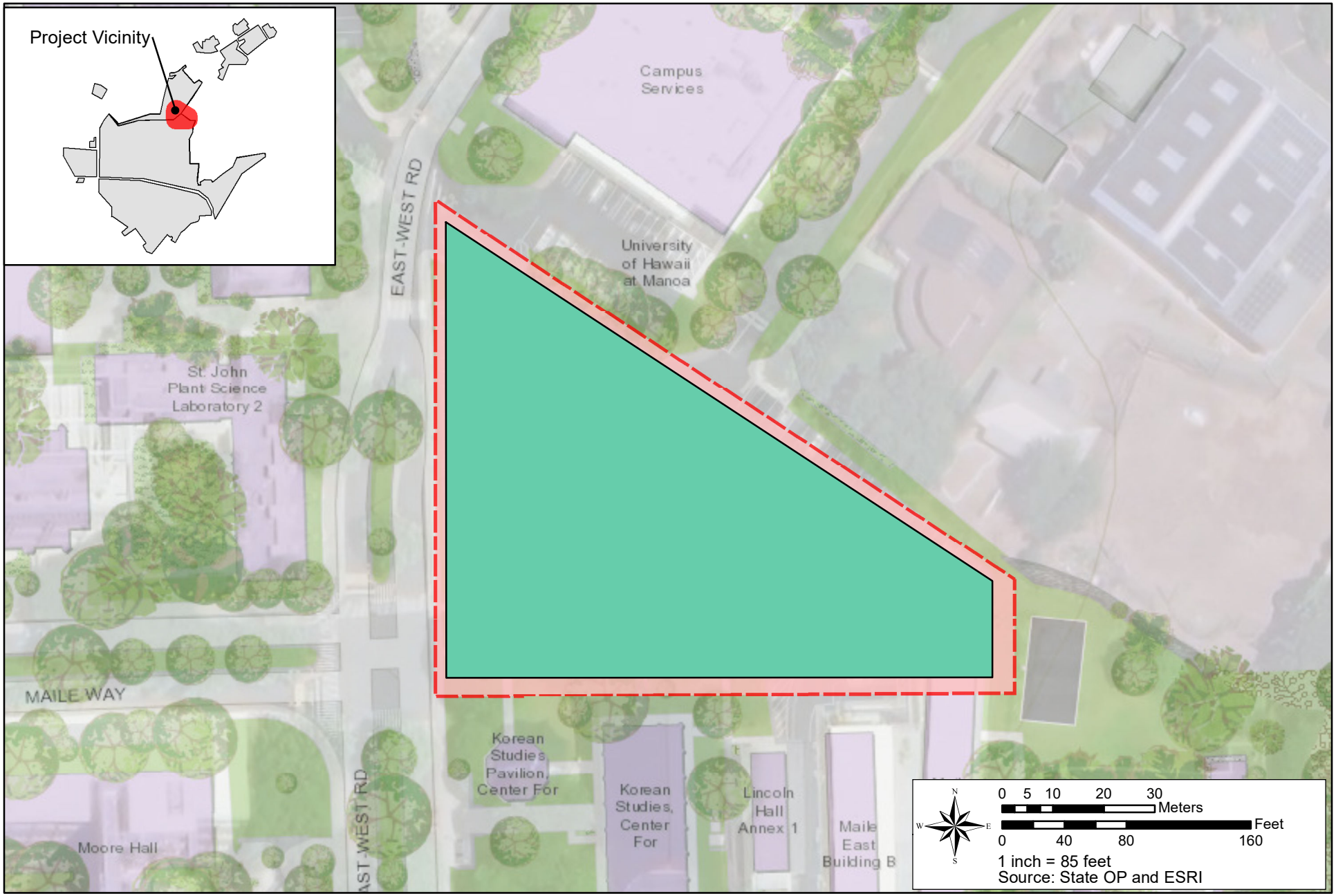


FIGURE 2-3

CENTRAL TRAFFIC CENTER AND PARKING STRUCTURE PROJECT SITE MAP

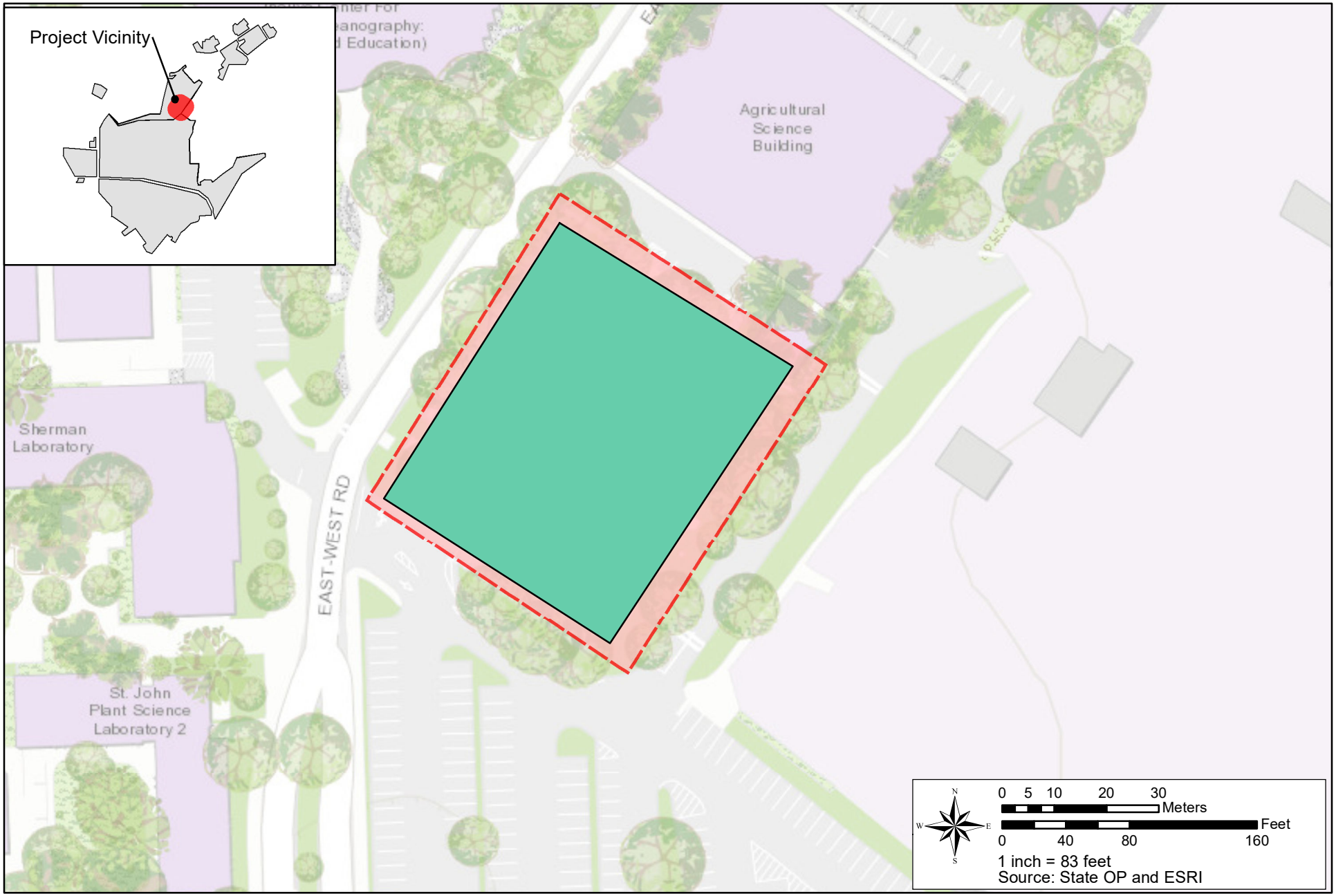


FIGURE 2-4

CENTRAL ADMINISTRATION FACILITY PROJECT SITE MAP

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2.2.1.3 ROTC Facility

The proposed new Reserve Officers' Training Corps (ROTC) Facility project is intended to provide a state-of-the-art facility on the UHM Lower Campus, replacing the existing ROTC portables, to support the UH's Air Force, Army, and Naval ROTC programs (See Figure 2-5).

ROTC Facility is envisioned to be approximately 25,000 SF, and two-stories in height situated at the same site as the existing ROTC portables. This location provides continued access to the athletic fields used by the ROTC programs for drills and training. The ROTC Facility will provide a space for cultivating a culture of joint leadership across the branches; shared classrooms; dedicated class labs for training and simulation; faculty and staff offices; interaction, meeting, and conference spaces; a recruiting office and museum; locker rooms, restrooms, and a gym; and an event space.

2.2.1.4 Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion & Track Relocation

On December 17, 2020, the Stadium Authority declared that the existing Aloha Stadium, the longtime home for UH Football, would no longer be safe to host spectator events due to the observed cumulative deterioration of the structure stemming from a lack of funding for deferred maintenance of the facility. In response, the UH retrofitted the Clarence T.C. Ching Athletic Complex in the Summer of 2021 to host UH Football games, which was permitted under PRU Minor Modification Permit No. 2021/MOD-38(GT). At the time, the Clarence T.C. Ching Athletic Complex had a total seating capacity of approximately 3,500 spectators, primarily in the mauka grandstand. PRU Minor Modification Permit No. 2021/MOD-38(GT) allowed the UH to expand the Clarence T.C. Ching Athletic Complex from 3,500 spectator capacity to approximately 10,000 spectators through new bleachers and press boxes; installation of new scoreboards, video boards, and ribbon boards; installation of field goal netting posts and flag poles; staging areas for visiting team storage containers; gameday staff office portables; and other miscellaneous football program operations and improvements (herein referred to as the "Clarence T.C. Ching Athletic Complex Phase 1 Expansion).

The UH is now proceeding with its Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion which will expand the existing spectator capacity from 10,000 to approximately 17,000 spectators in order to meet National Collegiate Athletic Association (NCAA) and Football Bowl Subdivision (FBS) competition requirements that mandate a minimum attendance of 15,000 spectator average over a two-year period. To expand the existing Clarence T.C. Ching Athletic Complex, the existing 'Ewa endzone grandstand will be removed (approximately 1,239 seats) and replaced with a new grandstand with approximately 5,200 seats; the makai-'Ewa corner would be enclosed with approximately 350 seats; the makai-Diamond Head corner would be enclosed with approximately 700 seats; the existing Diamond Head endzone would be expanded from approximately 1,990 seats to approximately 2,840 seats; the mauka-Diamond Head corner would be enclosed with approximately 700 seats; and the existing Mauka grandstand would be abandoned (approximately 2,402 seats) and built over with a new grandstand with approximately 3,400 seats, along with a lanai that would include a café, bar, and concessions (See Figure 2-6).

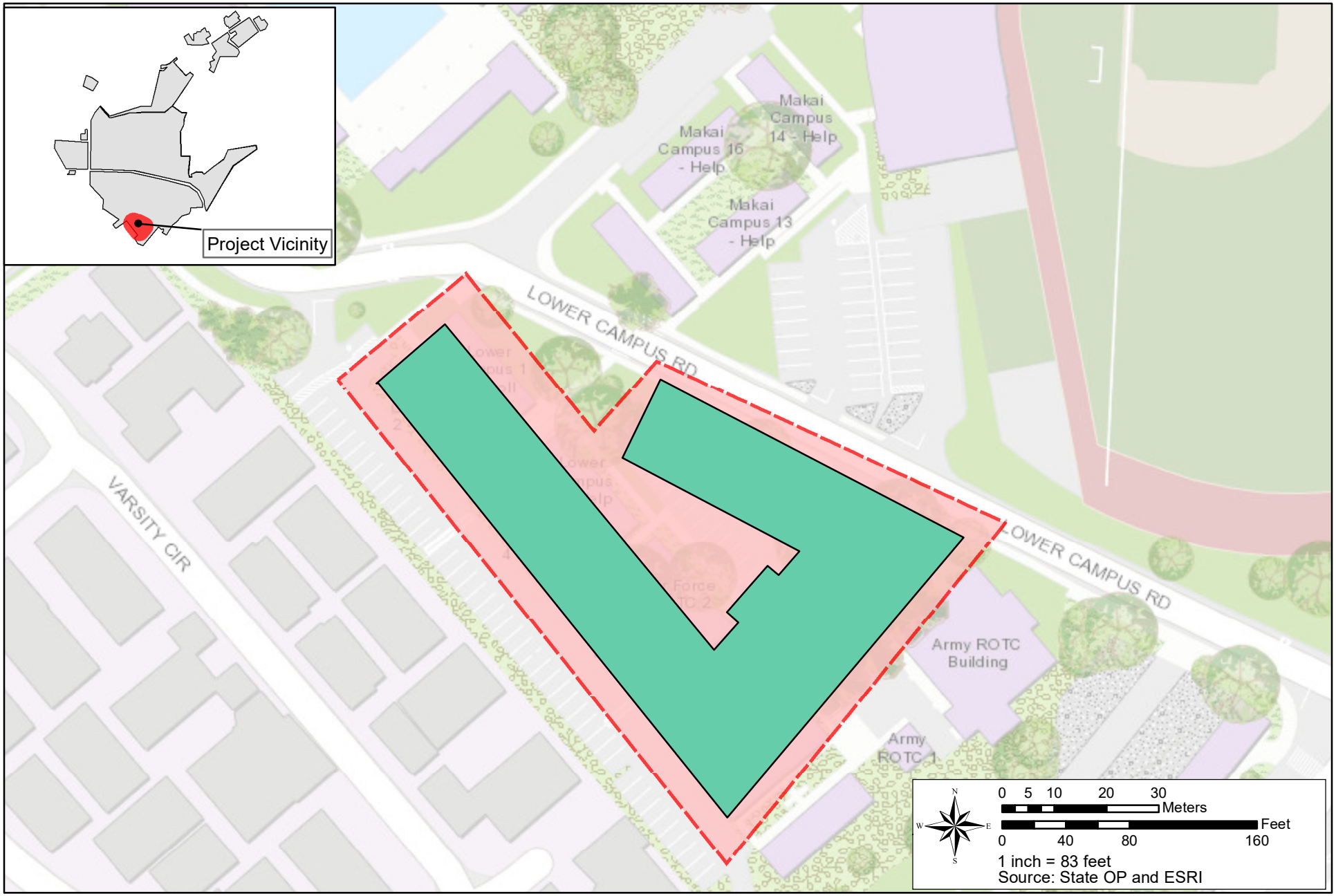


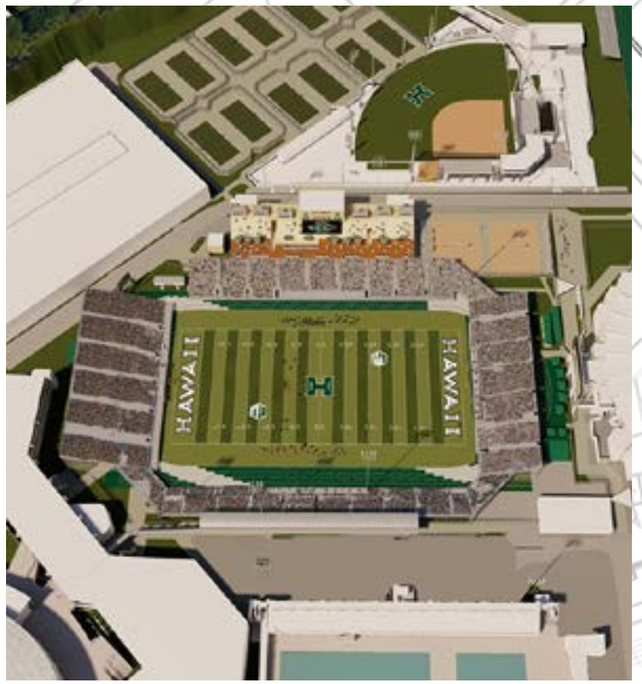
FIGURE 2-5

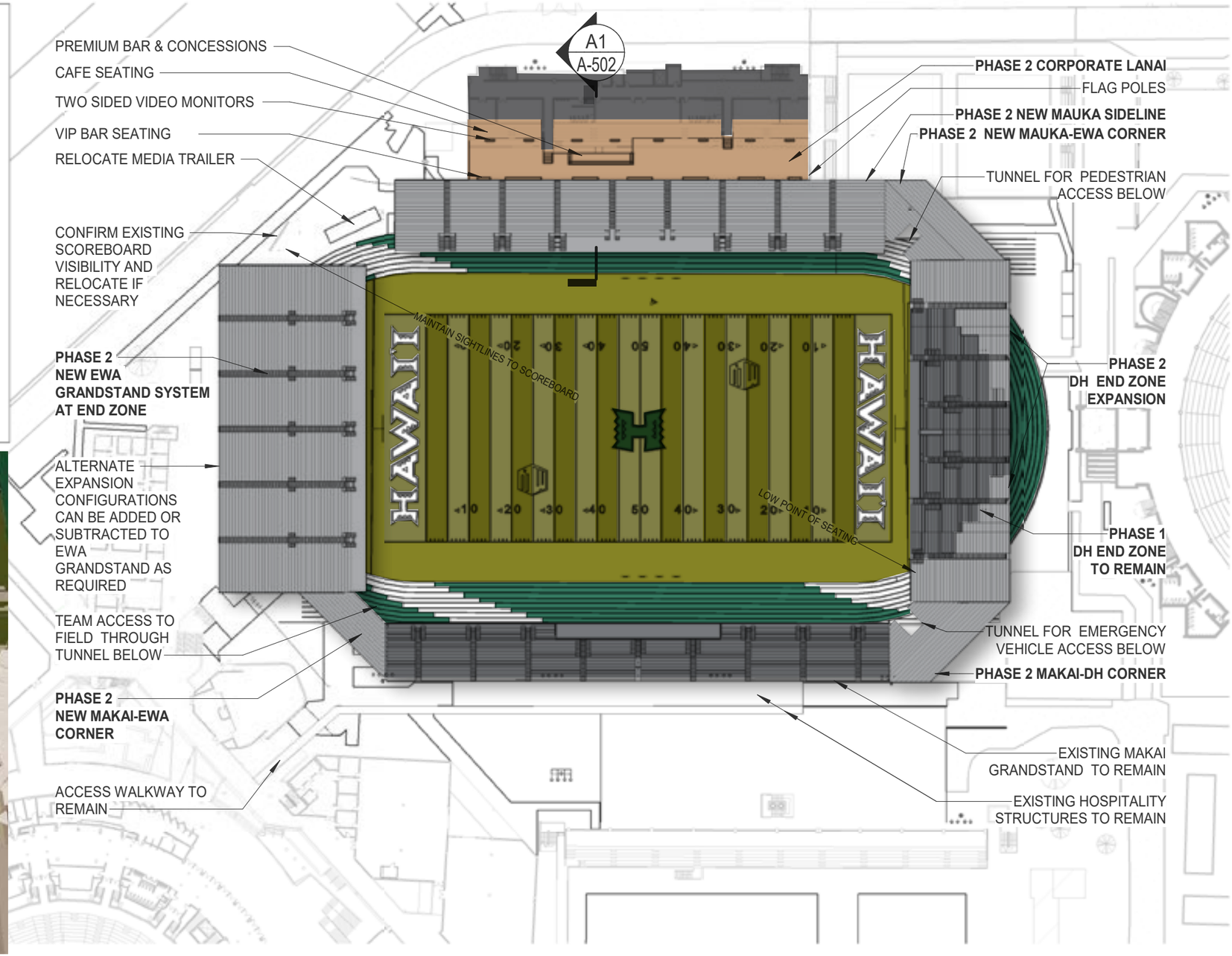
ROTC FACILITY PROJECT SITE MAP

Figure 2-6 Clarence T.C. Ching Athletic Complex Phase 2 Expansion

PHASE 2 SEATING SCHEDULE
CONCEPTUAL PLAN

Seating Area	Quantity	Description / Notes
Phase 1		
Mauka Sideline	2402	Existing Ching Complex Grandstand
Makai Sideline	3399	InProduction Grandstand A – 19"/seat
Diamond Head End Zone	1990	InProduction Grandstand B – 19"/seat
Ewa End Zone	1239	Relocated Bleacher System- 18"/seat
Makai Hospitality Structure	320	VIP
Total Phase 1	**9,350**	
Phase 2 Additional Seating		
Remove (E) Ewa End Zone	-1239	Demolish existing grandstand
Abandon (E) Mauka Sideline	-2402	Ching building press boxes to remain
New Mauka Sideline	3400	New grandstand system and Lanai
Mauka-DH Corner	700	Extend and connect to Mauka
DH End Zone Expansion	850	Extend and connect to existing
New Ewa End Zone	5200	New grandstand system
Makai-Ewa Corner	350	Provide emergency vehicle access at ground level
Makai-DH Corner	700	Provide pedestrain access at ground level
	11,200	Estimated total capacity of Phase 2 expanded seating
Total Phase 2	**16,909**	**ESTIMATED TICKETED CAPACITY**





Other improvements include improved pedestrian connections between the parking garage and the Clarence T.C. Ching Athletic Complex; temporary and permanent restroom facilities; secure perimeter fencing and access gates to the Clarence T.C. Ching Athletic Complex; crowd control barriers; additional press boxes; additional concession areas; and new locations of game clocks, play clocks, scoreboards, ribbon boards, video boards, and TV camera locations. However, with the expansion of the Clarence T.C. Ching Athletic Complex to approximately 17,000 seats, the existing track would be displaced. Thus, it is currently expected that the track will be relocated to the existing Cooke Practice Field (See Figure 2-7). At this time, details regarding the track relocation are limited and is expected to covered under separate Chapter 343, HRS documentation. It should be noted that the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project is anticipated to be a temporary home for the UH Football program until the New Aloha Stadium is constructed and ready for operation. The New Aloha Stadium project is currently undergoing its own environmental review process. It is anticipated that the UH Football program will relocate once the New Aloha Stadium is operational, which is expected to be approximately five years after all required approvals are obtained.

2.2.2 Demolition, Replacement, and Reconstruction of Existing Structures (No Net Increase)

This category includes the demolition of existing structures and/or the replacement/ reconstruction of existing structures located generally at the same site with generally the same or lower intensity in use, capacity, density, height, and dimensions, which may qualify for a Chapter 343 exemption. There are a few projects within this category that are currently anticipated at this time, but other projects may also occur during the life of the 2019 LRDP Update and associated entitlements (Chapter 343,HRS and Plan Review Use Permit) which will also be covered but are not specifically described in the subsections presented below.

2.2.2.1 Mini Master Plan Phase 2 (Snyder Hall Replacement & Varney Circle Improvements)

This project includes the replacement of the approximate 60,000 SF Snyder Hall with a new building of roughly the same footprint. The project is envisioned to be a modern facility consisting of approximately 60% office space, 20% collaboration space, and 20% classroom space that support modern methods of online delivery, collaboration, and advising. It is anticipated that the new facility will not exceed the existing facility’s height and mass. However, should funding be available, the UHM is considering constructing an additional, sixth floor on the new facility, that would increase the square footage to approximately 72,000 SF.

In association with this project, the UH intends to create more outdoor space and create a new pedestrian-friendly pathway envisioned on Campus Road from Metcalf to Varney Circle by converting the interior vehicle roads into pedestrian malls. Exterior work will include landscaping improvements and creation of pedestrian-friendly environments linking McCarthy Mall to the Legacy Path, Hawai‘i Hall, and the Queen Lili’uokalani Center for Student Services (See Figure 2-8).



Figure 2-7: Track Relocation Concept

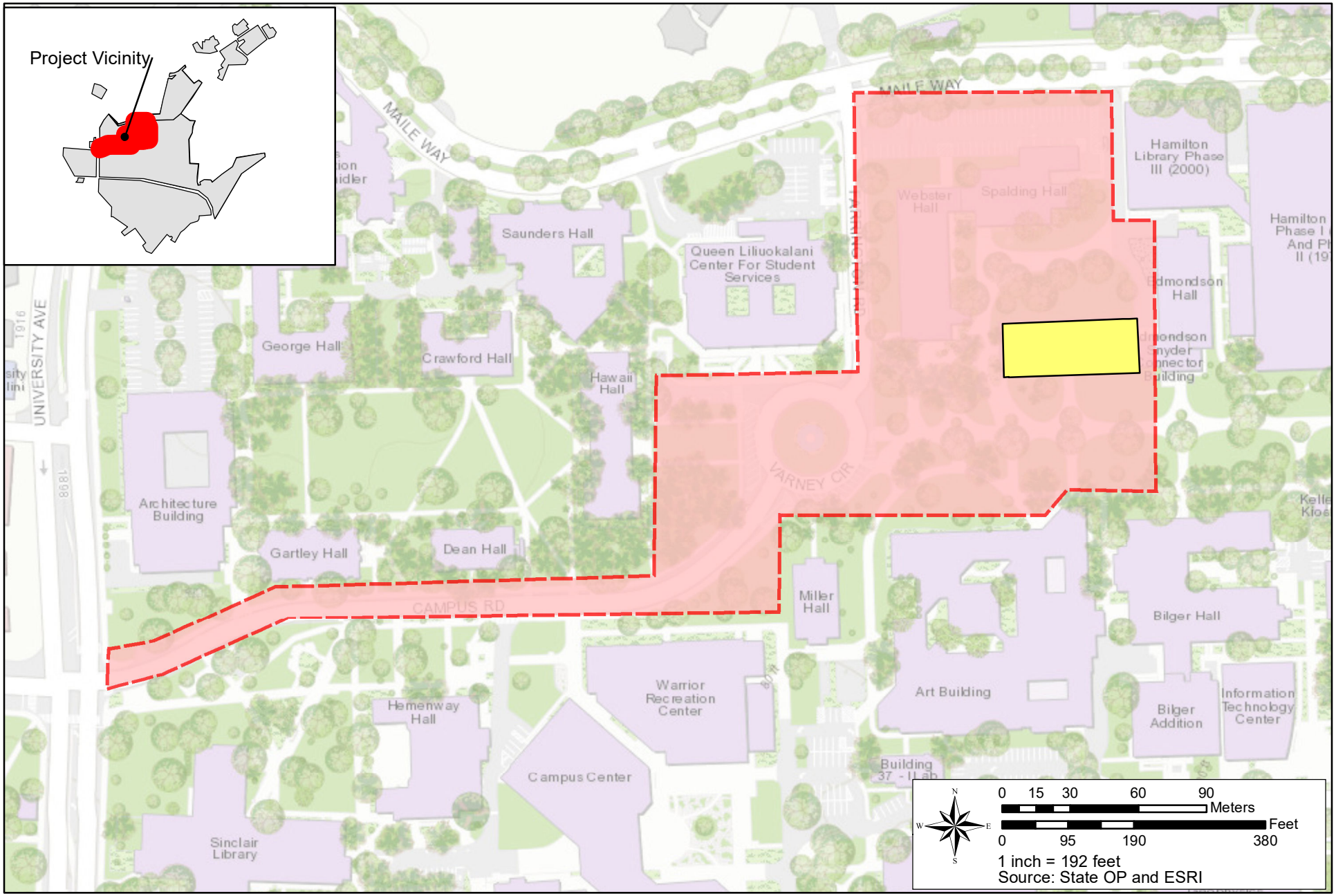


FIGURE 2-8

MINI MASTER PLAN PHASE 2 PROJECT SITE MAP

It should be noted that the former Snyder Hall was demolished in June 2021 and construction of the new facility is expected to commence between 2022-2025. The former occupants of Snyder Hall were relocated to the new Life Sciences Building. Snyder Hall was originally constructed in 1962 and required immediate replacement due to its age in condition. In the interim, various temporary landscaping elements are currently situated on the former Snyder Hall site and will remain until the UHM is ready to construct the new facility.

2.2.2.2 Kuykendall Hall Renovation or Demolition

Kuykendall Hall is an approximate 91,450 SF two-building structure consisting of a seven-story office tower and a four-story classroom building. that was constructed in 1964 for office and classroom space for the UHM English Department. Kuykendall Hall is one of the primary facilities on campus for delivering undergraduate education and is widely regarded as one of the facilities that is in poorest condition.

The Kuykendall Hall Renovation site, situated at 1733 Donagho Road, adjacent to Correa Road and the Legacy Path, and proximate to Campus Center and Warrior Recreation Center, is considered integral to the overall campus experience and physical plan as it is centrally located.

The Kuykendall Renovation project will renovate the current two-part building into a modern facility (See Figure 2-9). Programmatic use of the building is anticipated to be similar to current use with no change in planned occupancy. However, it should be noted that the current condition of Kuykendall Hall is poor. If the UHM is unable to secure enough funding to complete the renovations as described herein, the UHM may need to demolish the existing building for health and safety reasons.

2.2.2.3 Holmes Hall Renovation

Holmes Hall is an approximate 227,426 SF four-story building situated at 2540 Dole Street that is the home of the College of Engineering at the UHM. The Holmes Hall Renovation Project is an interior renovation of the building to update research lab and office space, improve building safety and accessibility, and to improve the overall sustainability performance of the building (See Figure 2-10). Improvements will include relocation of non-load bearing partitions, and upgrades to electrical, mechanical, and plumbing systems to improve energy and resource performance. The building envelope will not be modified substantially other than as required to ensure building performance. The project will also include landscaping work around the building exterior to improve the overall beauty of the UHM campus.

2.2.2.4 Keller Hall Renovation

Keller Hall is an approximate 51,309 SF four-story building situated at 2565 McCarthy Mall. The building is primarily used by the UHM Mathematics and Computer Science Department and is named after Arther Ripont Keller, the first dean of the College of Applied Sciences and former Acting President of the UH. The Keller Hall Renovation Project is anticipated to be an interior renovation of the building to update classroom spaces in line with modern pedagogy and to improve the overall sustainability performance of the building (See Figure 2-11).

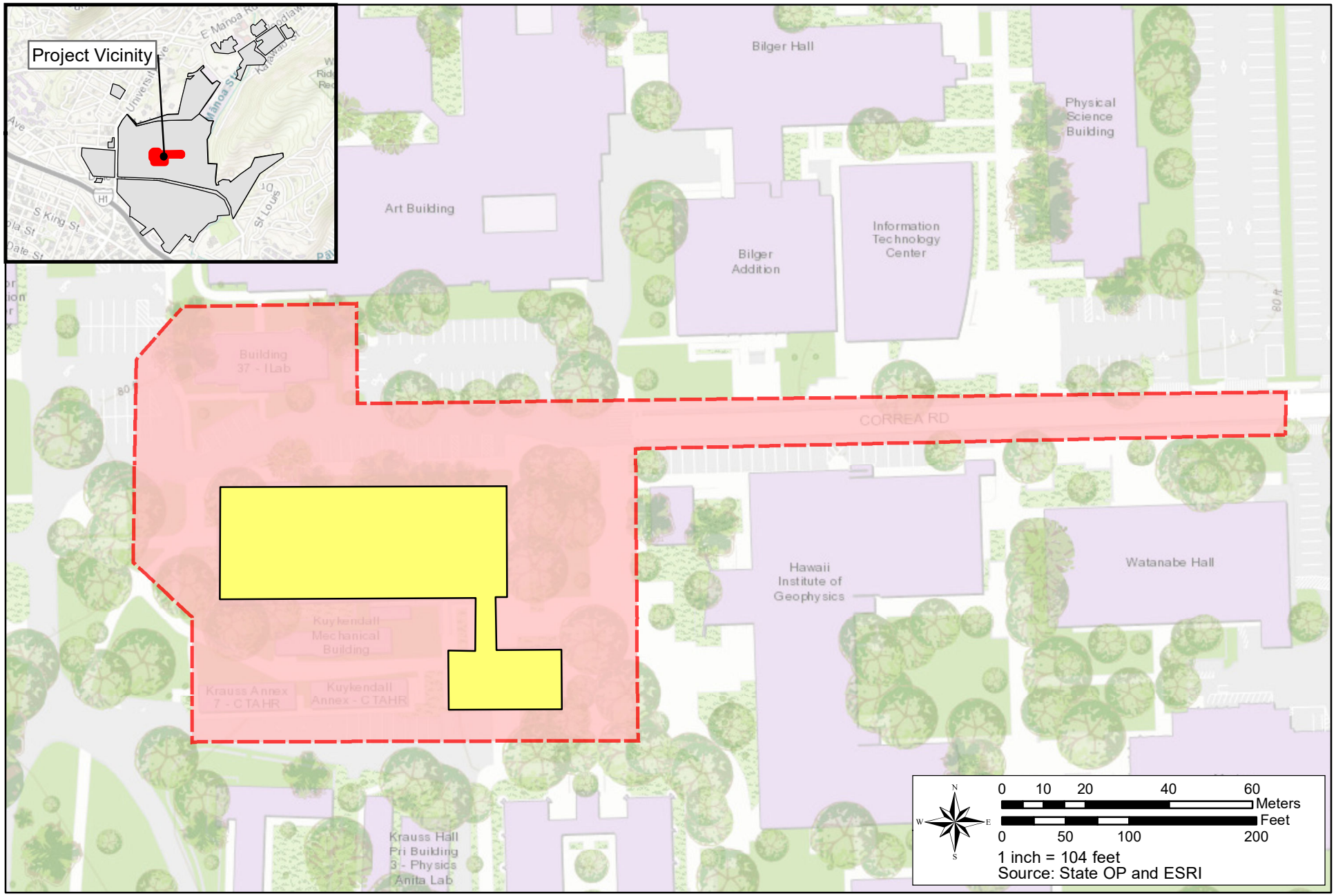


FIGURE 2-9

KUYKENDALL HALL RENOVATION PROJECT SITE MAP

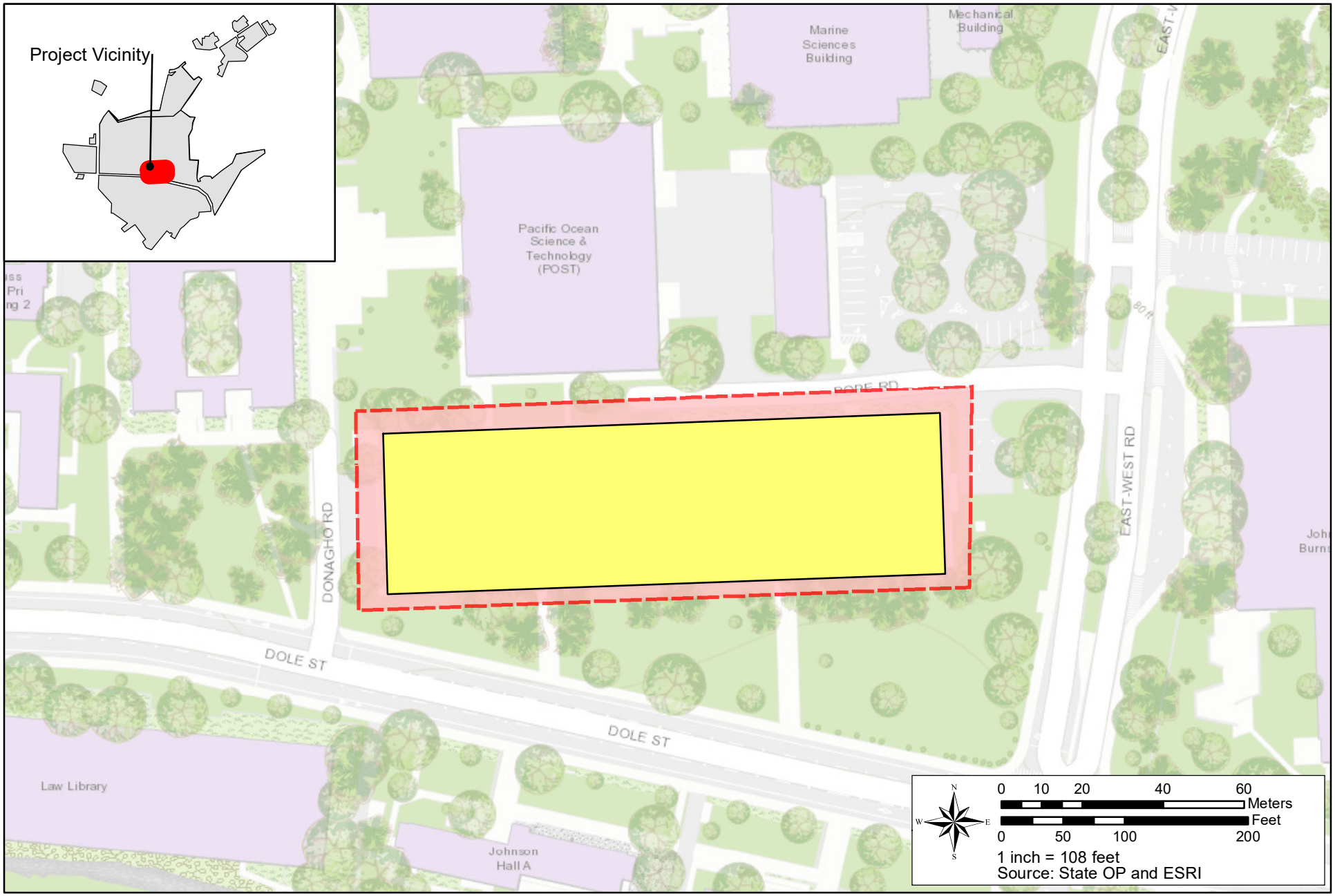


FIGURE 2-10

HOLMES HALL RENOVATION PROJECT SITE MAP

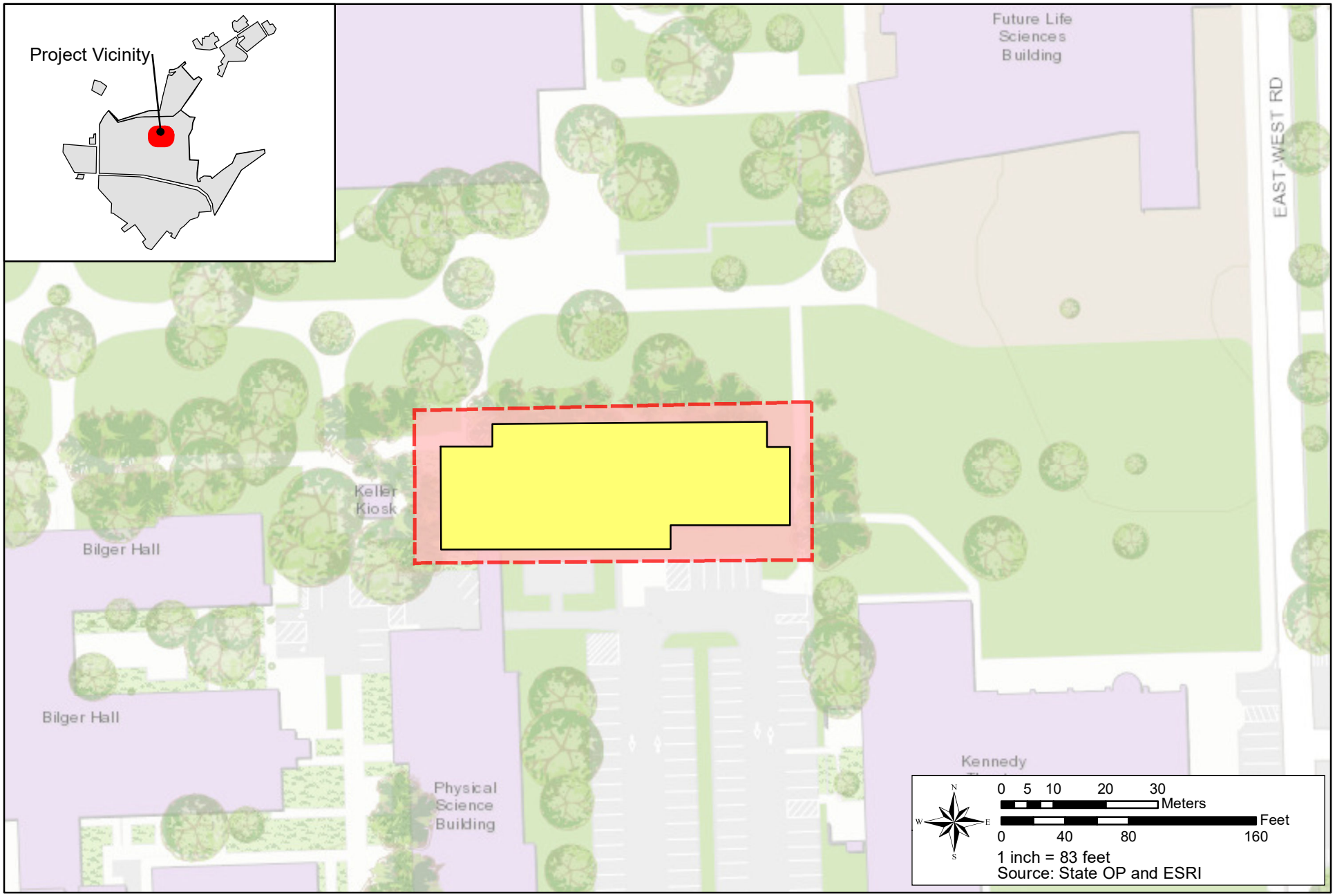


FIGURE 2-11

KELLER HALL RENOVATION PROJECT SITE MAP

Improvements will include relocation of non-load bearing partitions, upgrades to electrical, mechanical, and plumbing systems to improve energy and resource performance. The building envelope will not be modified substantially other than as required to ensure building performance. The project will also include landscaping work around the building exterior to improve the overall beauty of the UHM campus. Should the renovation cost due to building condition exceed the cost to replace, a building replacement project will be considered of equal or less square footage.

2.2.2.5 Hamilton Library Renovation

Hamilton Library is the main research library for the UH and is an approximate 310,100 SF five-story building built in 1968 and named after Thomas Hale Hamilton. Hamilton Library also includes the Hamilton Library Addition, which is an approximate 104,776 SF five-story building built in 2001 for added occupancy. Hamilton Library supports the UHM’s land-,sea-, and space-grant status, as well as the various campus programs and researchers from across the globe.

Hamilton Library provides a world class collection related to Hawai'i, Oceania, and the Pacific Islands, as well as China, Japan, Korea, Okinawa, the Philippines, Russia, South Asia, and Southeast Asia with more than 3.2 million print volumes, as well as archives and manuscripts, maps, rare books, audiovisuals, art, and millions of digital resources.

It should be noted that in 2004, a flash flood occurred in Mānoa Valley and significantly damaged the ground floor of the Hamilton Library, destroying the Library & Information Science Program as well as thousands of government documents, map collections, systems and cataloging and acquisitions services. All the library file servers were also lost during the 2004 flood. Hamilton Library has since recovered, however, many valuable sources of information were lost due to the 2004 flood.

The Hamilton Library Renovation Project is a partial interior renovation of the facility to repurpose existing open stack book storage space as open study and workspace for students, faculty, and staff (See Figure 2-12). Improvements will include limited relocation of non-load bearing partitions, upgrades to electrical, mechanical, and plumbing systems to improve energy and performance and ensure code compliance. The building envelope will not be modified. The project will also include landscaping work around the building exterior to improve the overall beauty of the UHM campus.

2.2.2.6 Student Success Center: Sinclair Library Renovation

Sinclair Library is an approximate 116,353 SF four-story building constructed in 1956 situated at 2425 Campus Road.

The existing Sinclair Library is constructed of reinforced concrete, brick, glass, and sandstone featuring an exterior running bond pattern of painted red brick, glass windows, horizontal bands of concrete, an open floor plan that enables flexibility in use, and multiple lanai on the first, second, and third floors. The Sinclair Library is considered significant as it is an example of the use of international style of architecture.

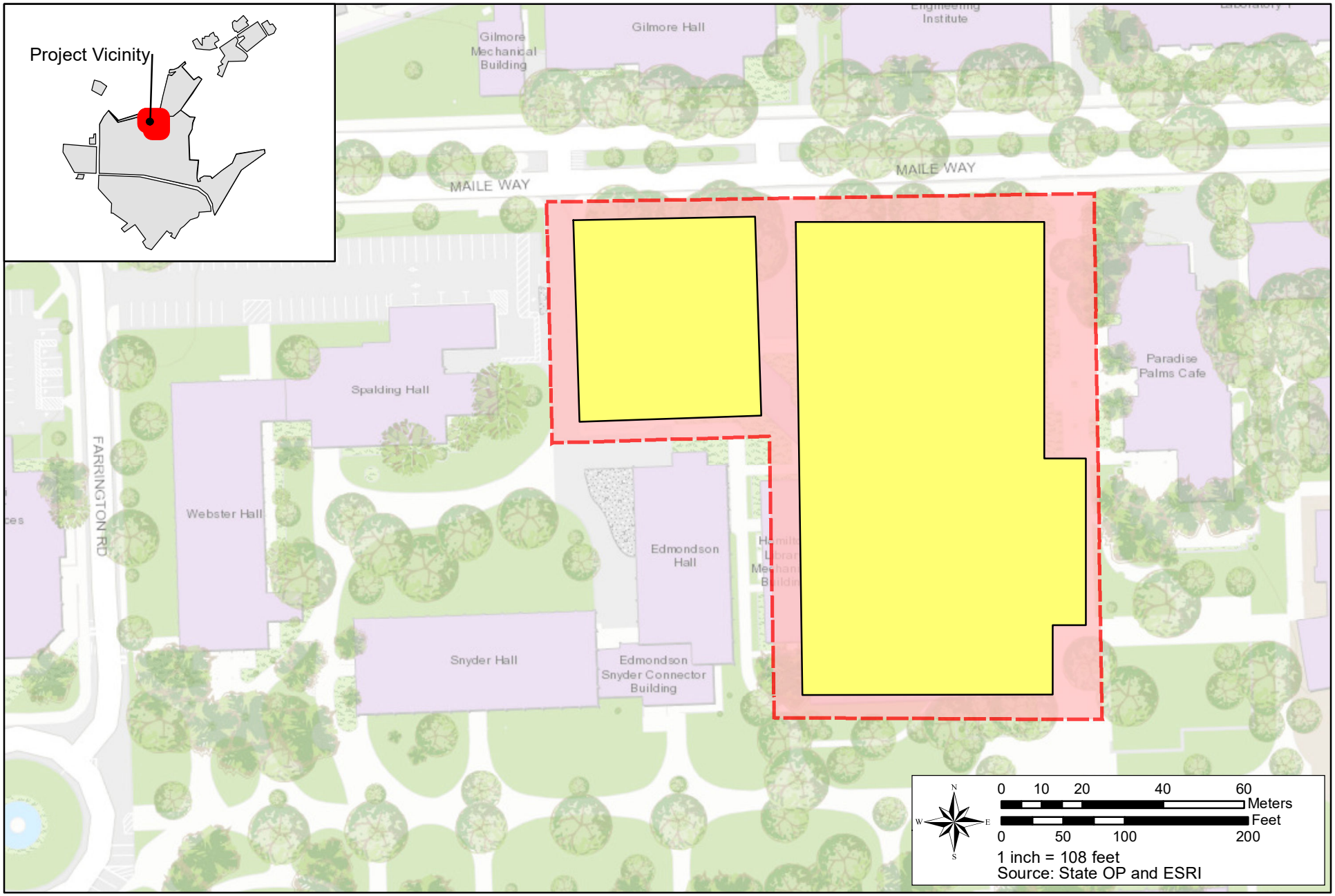


FIGURE 2-12

HAMILTON LIBRARY RENOVATION PROJECT SITE MAP

UNIVERSITY OF HAWAI'I AT MĀNOA LONG RANGE DEVELOPMENT PLAN

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The renovation of the existing Sinclair Library will convert the book-centric library into a 21st century student success center. The renovation will upgrade Sinclair Library's infrastructure, improve occupant safety, and repurpose underutilized spaces for counseling, knowledge sharing, technology support, and community building (See Figure 2-13). Improvements will include relocation of non-load bearing partitions, and upgrades to electrical, mechanical, and plumbing systems to improve energy and resource performance. The project will also improve landscaping around the exterior of Sinclair Library to improve the overall beauty of the UHM campus and to improve usage of the outdoor space between Sinclair, Hemenway Hall, and Campus Center.

2.2.2.7 Temporary Building Demolition Program

As part of the consolidation effort identified in the UH Mānoa Framework for the Future Plan, the LRDP anticipates the consolidation of programs to the Central Campus and, with the construction of the new facilities described above, the outdated and inefficient portable buildings on the UHM campus are anticipated to be demolished. Faculty, staff and students in the portables within the six zones identified and described below will be relocated to other facilities on the UHM campus.

Following the completion of the anticipated demolition program, the campus will realize a reduction of approximately 157,300 SF of building space, increasing the open space availability on campus. The zones are identified in Figure 2-14 which include:

- Lincoln Hall Annex Portable Building Demolition
    - Situated between the Center for Korean Studies and the Hale Laulima Dormitory are the Lincoln Hall Annex Portable Building which consists of four temporary portable buildings identified as 1179A Lincoln Hall Annex 1, 1179B Lincoln Hall Annex 2, 1077A Maile-East Building A, and 1077B Maile-East Building B (See Figure 2-15). As noted above, these portable buildings are anticipated to be demolished, resulting in an approximate net reduction of 14,500 SF. Occupants will be relocated to existing underutilized facilities and new facilities.

- Zone 1- Administrative Zone Portable Building Demolition
    - Scattered across the Central Campus portion of UHM are the Administrative Annex Portable Buildings that make up Zone 1 (See Figure 2-16). These buildings consist of 1125 Kuykendall Annex, 1024C Bachman Annex 2, 1046T Krauss Annex 19, 1046U Krauss Annex 7, 1103A Bachman Annex 9, 1103B Bachman Annex 10, 1103C Bachman Annex 11, 1103D Bachman Annex 12, 1103E Bachman Annex 13, 1133A Sinclair Annex 1, and 1133 B Sinclair Annex 2.

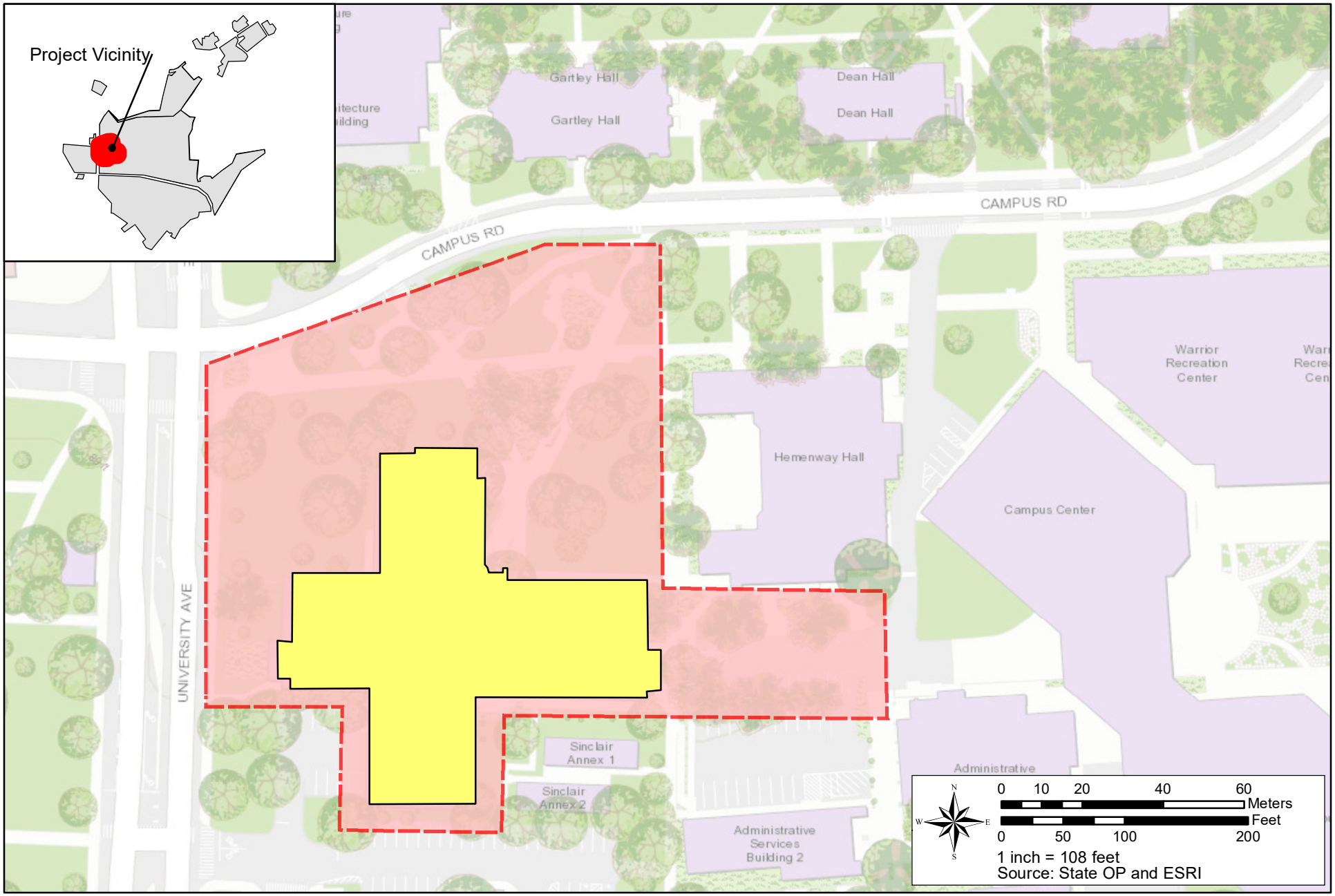

FIGURE 2-13

STUDENT SUCCESS CENTER: SINCLAIR LIBRARY RENOVATION PROJECT SITE MAP

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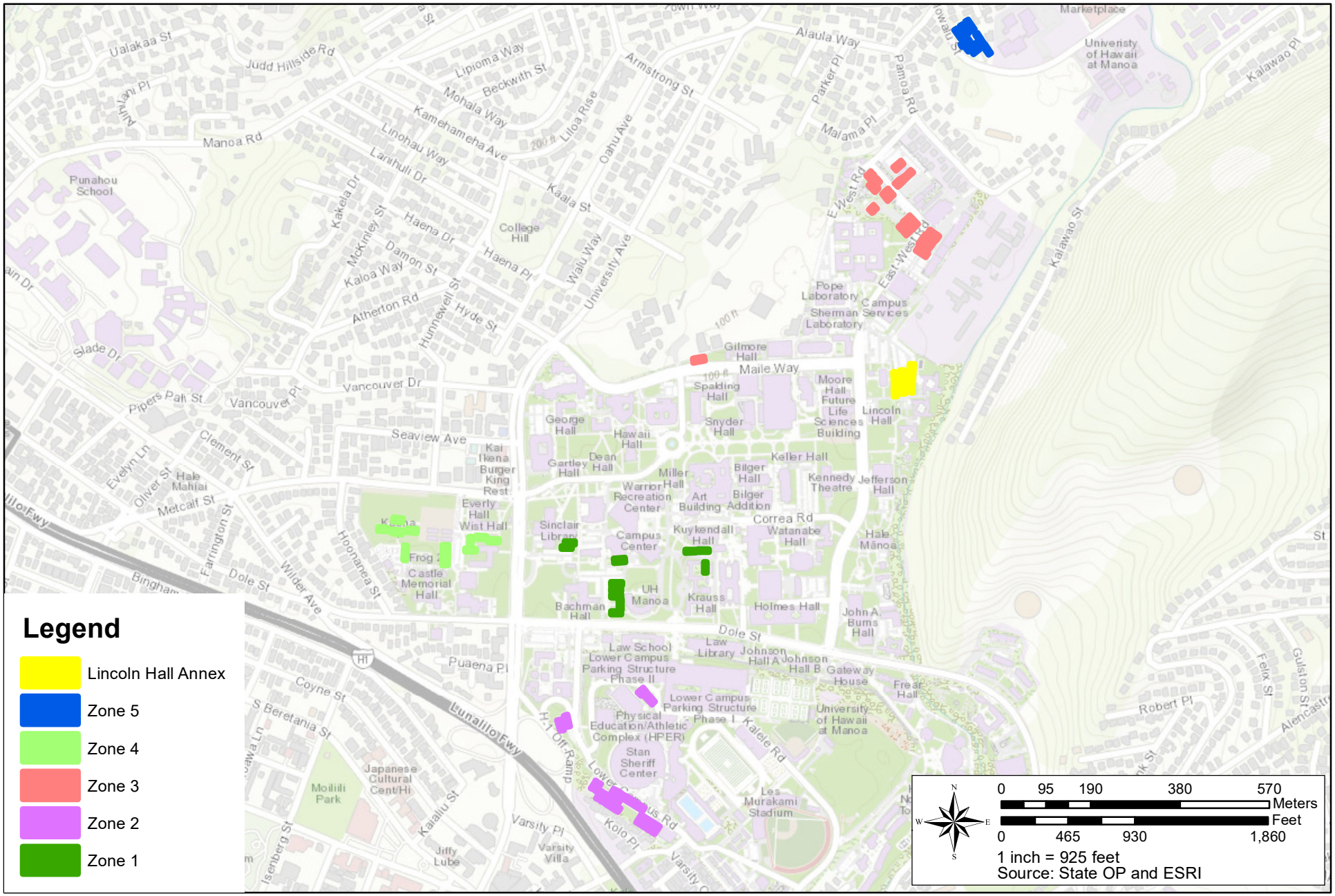

FIGURE 2-14

TEMPORARY BUILDING DEMOLITION PROGRAM MAP MAP



FIGURE 2-15

LINCOLN HALL ANNEX PORTABLE BUILDING DEMOLITION PROJECT SITE MAP

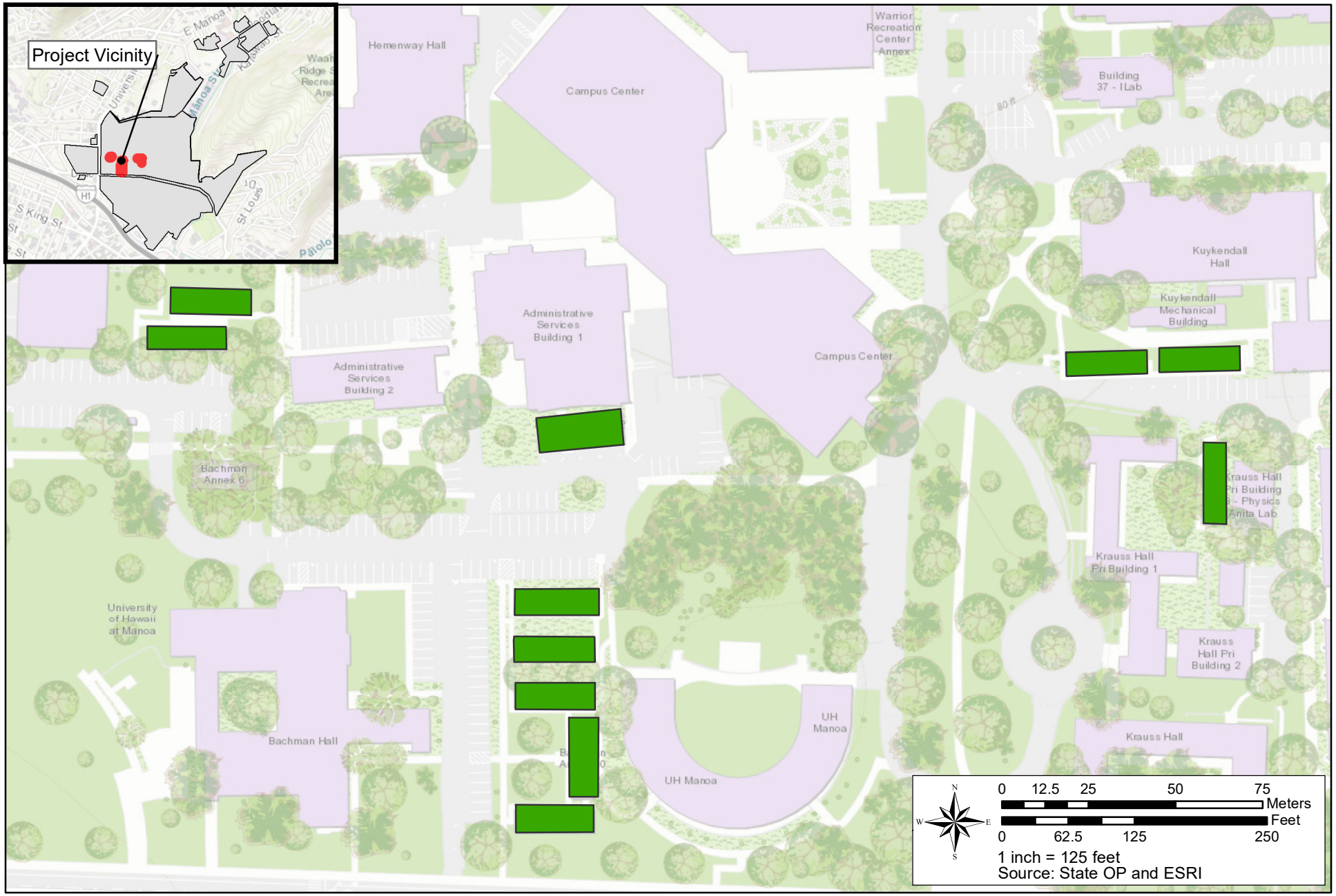

FIGURE 2-16

ZONE 1: ADMINISTRATIVE ZONE PORTABLE BUILDING DEMOLITION PROJECT SITE MAP

As noted above, these portable buildings are anticipated to be demolished, resulting in an approximate net reduction of 21,700 SF. Occupants will be relocated to existing underutilized facilities and new facilities.

- Zone 2- Fiscal Management Portable Building Demolition
  - Located on the UHM Lower Campus are the Fiscal Management Annex Portable Buildings which make up Zone 2 (See Figure 2-17). These buildings consist of 1092F Lunalilo Building 1, 1092I Lunalilo Building 2, 1108G Klum Annex 2, 1152E Varsity Annex 1, 1171A Varsity Building A, 1171B Varsity Building B, 1171C Varsity Building C, 1171E Varsity Building E, 1171G Varsity Building G, 1171H Varsity Building H, 1171L Varsity Building L, 1171M Varsity Building M, 1171N Varsity Building N, 1171 Varsity Building P, 1174A Lower Campus 1, 1174B Lower Campus 2, 1174C Lower Campus 3, 1174D Lower Campus 4, 1108A Air Force ROTC 1, 1108B Air Force ROTC 2, 1108C Army ROTC 1, 1108O Makai Campus 10, 1108P Makai Campus 11, 1108Q Makai Campus 12, 1108R Makai Campus 13, 1108S Makai Campus 14, 1108T Makai Campus 15, and 1108U Makai Campus 16. As noted above, these portable buildings are anticipated to be demolished, resulting in an approximate net reduction of 52,400 SF. Occupants will be relocated to existing underutilized facilities and new facilities.

- Zone 3- Transportation/Facilities Services Portable Building Demolition
  - Situated near the northeastern boundary of the UHM campus, adjacent to the Biomedical Sciences Building, are the Transportation/Facilities Services Annex Portable Buildings which make up Zone 3 (See Figure 2-18). These buildings consist of 1025B Maile Way Building 2, 1132A Physical Plant Building, 1132C Transportation Services, 1132E Transportation Services, 1149A Pamoa Building A, 1149B Pamoa Building B, 1149C Pamoa Building C, 1193 Physical Plant Building, 1193A Physical Plant Building 1, 1193B Physical Plant Building 2, 1200 Environmental Protection Facility, 1202A Mālama 1, 1202B Mālama 2, 1202C Mālama 3, 1202D Mālama 4, and 1172F Biomedical Mechanical Building. As noted above, these portable buildings are anticipated to be demolished, resulting in an approximate net reduction of 32,000 SF. Occupants will be relocated to existing underutilized facilities and new facilities.

- Zone 4- University Lab School Portable Building Demolition
  - The University Lab School has several portable annex buildings that make up Zone 4 (See Figure 2-19). These buildings consist of 1038A University Avenue Building 1, 1038B University Building 2, 1038C University Building 3, 1038D University Building 4, 1064A Kukahi 1, 1064B Kokoolua 2, 1064C Waikolu 3, 1064D Kauna 4, 1170A University Lab School – Batting Cage, and 1040 Wist Hall Annex 1.

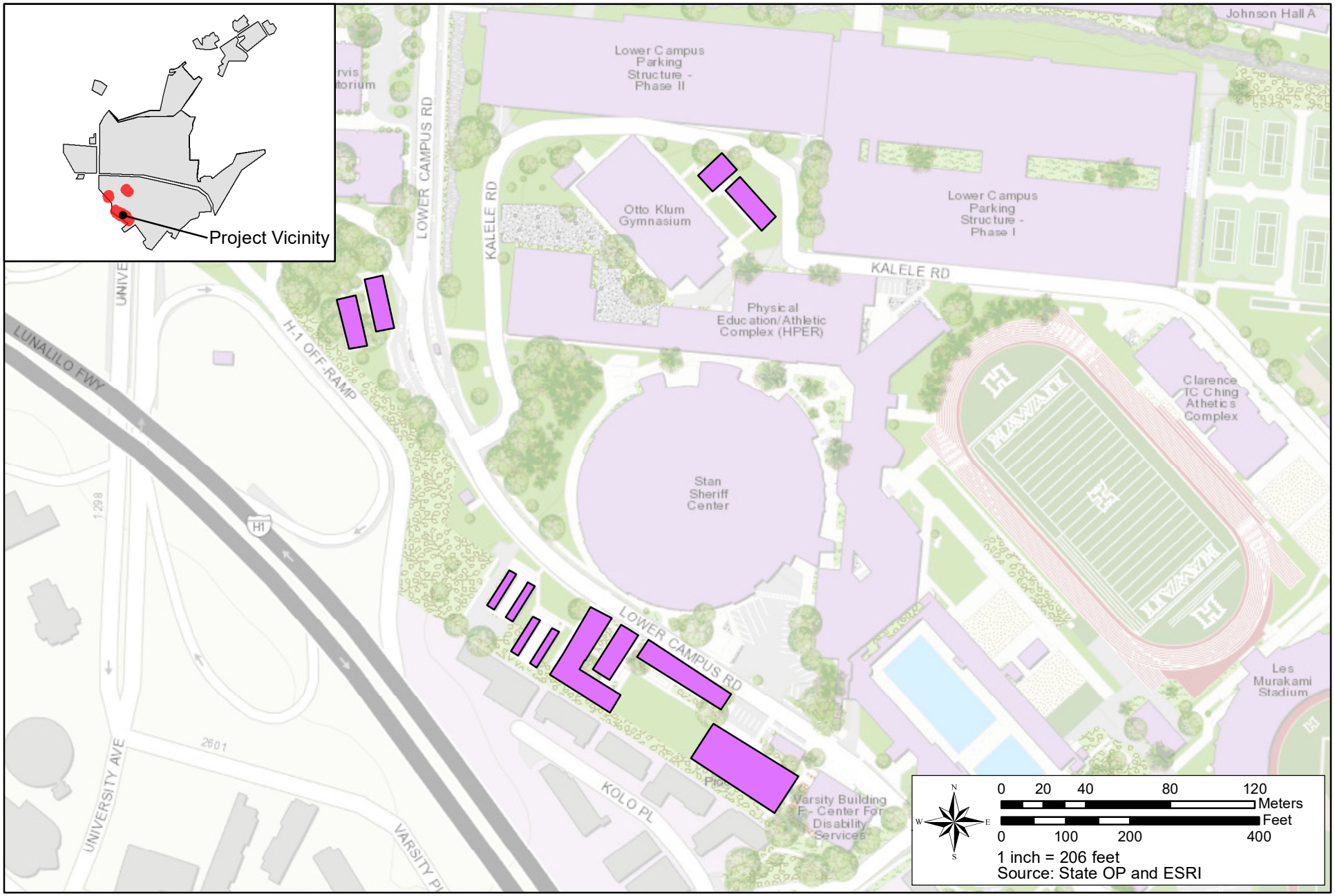

FIGURE 2-17

ZONE 2: FISCAL MANAGEMENT PORTABLE BUILDING DEMOLITION PROJECT SITE MAP



FIGURE 2-18

ZONE 3: TRANSPORTATION/FACILITIES SERVICES PORTABLE BUILDING DEMOLITION PROJECT SITE MAP

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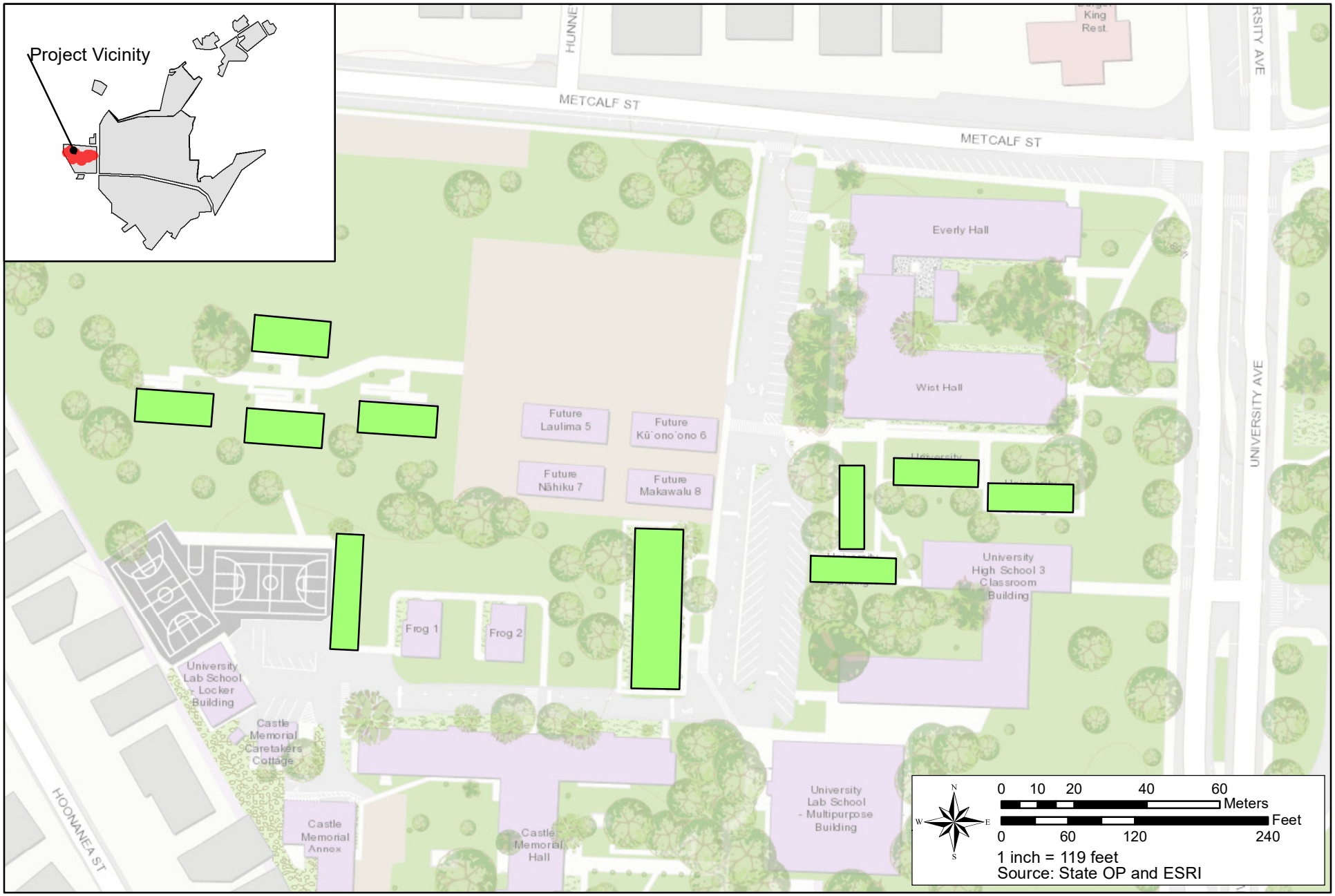

FIGURE 2-19

ZONE 4: UNIVERSITY LAB SCHOOL PORTABLE BUILDING DEMOLITIONPROJECT SITE MAP

As noted above, these portable buildings are anticipated to be demolished, resulting in an approximate net reduction of 22,800 SF. Occupants will be relocated to existing underutilized facilities and new facilities.

- Zone 5- UH Press Portable Building Demolition
  - Situated in Mānoa Valle on Woodlawn Drive are the UH Press Portable Buildings that make up Zone 5 (See Figure 2-20). These building consist of 1011A Woolawn1, 1011B Woodlawn 2, 1011C Woodlawn 3, 1011D Woodlawn 4, 1011E Woodlawn 5, 1011F Woodlawn 6, 1011G Woodlawn 7, and 1011H Woodlawn H. As noted above, these portable buildings are anticipated to be demolished, resulting in an approximate net reduction of 13,900 SF. Occupants will be relocated to existing underutilized facilities and new facilities.

2.2.3 Repair and Maintenance of Existing Structures and Infrastructure

This category includes any and all repair and/or maintenance of existing structures, facilities, infrastructure or equipment involving negligible or no expansion or change of use beyond that previously existing. These projects are normally covered as exemptions under Chapter 343, HRS and are excluded from the LRDP document as they consist primarily of routine repair and maintenance projects and they do not typically require DPP consultation for compliance with the PRU.

2.2.4 P3 Projects (Undergone Separate 343, Hawai'i Revised Statutes Processes)

One of the key elements of the UH Mānoa Framework for the Future Plan is to provide a campus living that supports the community and its well-being. This includes improving the on-campus experience and student retention by increasing the total housing stock to support current and future demands, and providing ancillary support facilities such as shops, restaurants, childcare, and other services and amenities that help keep the UHM community on campus. This endeavor also aids in achieving the goal of reducing the amount of vehicular trips to and from the UHM campus and increasing multi-modal activity on the campus proper.

Since State legislative funding is limited, the UHM actively explores the use of public-private-partnerships (P3) as a financing option to deliver new facilities. While the financing and deal structure of a P3 project vary, in general, they result in a project whereby a developer builds, finances, operates, and maintain the facilities for a long-term period, helping reduce the cost of construction, operation, and maintenance for the UHM.

Thus, while the UH works closely with a developer during the planning, entitlement, design, and construction phases of a P3 project, the developer is ultimately responsible for securing all the necessary entitlements and permits for the P3 project.

The UHM is currently working with developers on two separate P3 projects: the Mixed-Use Affordable Housing Project and the UHM Innovation Center & Residences For Innovative Student Entrepreneurs which are described further below in the subsequent subsections.



FIGURE 2-20

ZONE 5: UH PRESS PORTABLE BUILDING DEMOLITION PROJECT SITE MAP

Overall, the two P3 projects are moving forward, and have undergone their own review (including Chapter 343, HRS), entitlement, and permitting processes.

2.2.4.1 Mixed-Use Housing Project (NOAA Property)

The proposed Mixed-Use Housing P3 Project is situated on a 2.21-acre site located at 2570 Dole Street, further identified by TMK [1] 2-8-023:009, which was the former home for the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (See Figure 2-21). The UHM entered a P3 with Greystar Development Services, LLC to design, build, finance, operate, and maintain a multi-family mixed-use rental housing project for UHM students and junior faculty. The Mixed-Use Housing P3 project is intended to provide a “live, work, play” environment for UHM students and residents while supporting the UH’s long-term sustainability and connectivity goals by reducing vehicular trips to the campus and increasing the UHM’s housing inventory.

The Mixed-Use Housing Project will demolish the three existing structures on the 2.21-acre site and construct a new structure consisting of two adjoining towers, a makai tower that will be approximately 12 stories in height and a mauka tower that will be approximately 18 stories in height, which will be connected by a two-story podium. In total, the Mixed-Use Housing Project will include up to 320 individual housing units with a mix of studio, one-, two-, three-, and four bedroom units. The bottom floor of the facility is anticipated to be dedicated to childcare, retail, circulation, and gathering spaces. The childcare facility on the ground floor will replace the existing UHM Children’s Center located at 2320 Dole Street which served over 100 children pre-COVID. It should be noted that the Mixed-Use Housing P3 Project was subject to its own Chapter 343, HRS process and published its Final EA/Finding of No Significant Impact (FONSI) in March 2021. The Mixed-Use Housing Project was also subject to the City and County’s PRU Minor Modification Permit, which was successfully approved January 2022. Construction of the project is anticipated to commence by Spring 2023 and end by Summer 2025, starting operations for the Fall 2025 semester.

2.2.4.2 University of Hawai‘i at Mānoa Innovation Center & Residences For Innovative Student Entrepreneurs

The UH partnered with the UH Foundation and Hunt Development Group to design, build, finance, operate, and maintain the UHM Innovation Center & Residences For Innovation Student Entrepreneurs P3 Project (herein referred to as the “Innovation Center”). The Innovation Center will be situated in lower Mānoa at 1810 University Avenue, further identified by [1] 2-8-016:001, at the former site of the Atherton YMCA Branch which was an alternative dormitory option for UHM students (See Figure 2-22). The Innovation Center P3 Project is envisioned to bring an integrated, live, learn, work, innovation center supporting the innovation and entrepreneurship community at UHM.

The project is anticipated to consist of approximately 98,682 SF, with programming that will include student housing and residential common area, the innovation and entrepreneurship center, project service areas, retail space, and on-site parking.

The site was previously occupied by two main structures: the 47,425 SF Charles Atherton House and the 15,645 SF Mary Atherton Richards House.

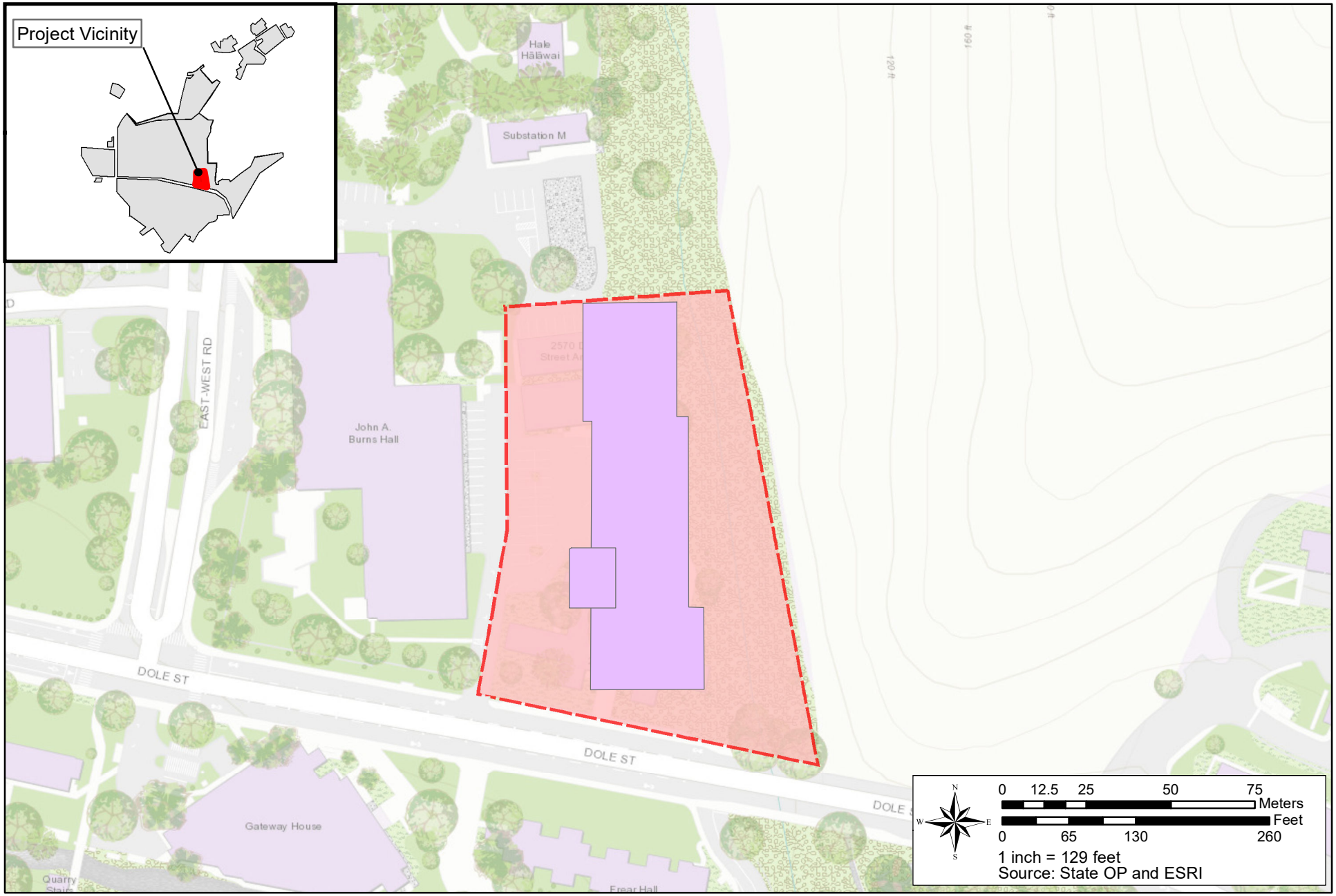

FIGURE 2-21

MIXED-USE HOUSING PROJECT (NOAA PROPERTY) SITE MAP

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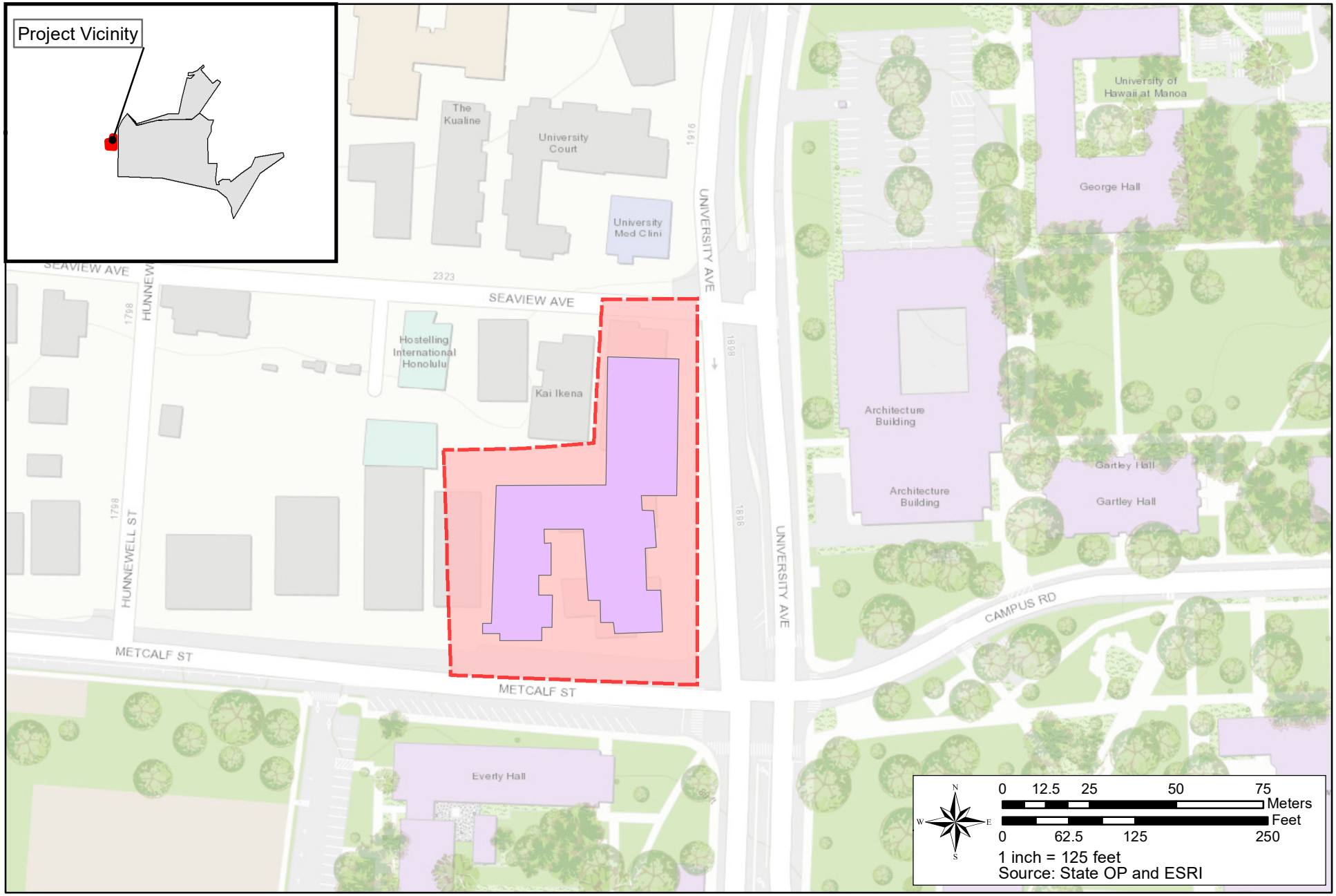


FIGURE 2-22

UNIVERSITY OF HAWAIʻI AT MĀNOA INNOVATION CENTER &
RESIDENCES FOR INNOVATIVE STUDENT ENTREPRENEURS PROJECT SITE MAP

UNIVERSITY OF HAWAIʻI AT MĀNOA LONG RANGE DEVELOPMENT PLAN

WILSON OKAMOTO CORPORATION

The project involves the demolition of the Mary Atherton Richards House and the erection of the Innovation Center. The Charles Atherton House will be retained and repurposed.

Examples include the installation of upgrades and new sewer, water, and drainage, electrical and telecommunications improvements, along with the installation of renewable energy systems (including roof-mounted photovoltaic panels and photovoltaic installations over parking facilities and associated improvements).

2.2.5 General infrastructure Improvements

The UH contracted R.M. Towill Corporation (RM Towill) to conduct Sewer, Water, and Drainage Master Plans (See Appendix B, C, and D respectively) for the UHM campus to assess the impacts of the proposed development encompassed within latest LRDP Update on the sewer, water, and drainage infrastructure. The existing conditions of the infrastructure systems and the anticipated impacts the projects within the latest LRDP update are more fully described in the respective sections of Chapter 3 of this EA.

2.2.5.1 UHM Photo Voltaic (PV) Power Plant

In support of 304A-199, HRS which requires that UH establish a collective goal of becoming net-zero with respect to energy use (producing as much energy as the system consumes across all campuses by the year 2035), the UHM has prepared a comprehensive campus master plan for the proposed photovoltaic (PV) systems (See Appendix E). The UHM PV Power Plant Project includes a study which identifies baseline conditions of UHM facilities, explores the feasibility of installation of PV components on all potential surfaces on campus (including on building rooftops and elevations, walkways, courtyards, parking lots, roadways, and unrestricted landscape areas), and considers the use of PV components in all available forms (including standard panels or via Building Integrated PV units such as roof tiles, atriums, canopies, window glazing & siding, etc.).

The study presents and evaluates three alternate scenarios (see Section 5.4 for more details) for PV on campus, to provide UHM stakeholders a range of PV options from which a comparative review and evaluation could be made to arrive at an optimal PV design and battery storage approach that is documented as the Preferred Scenario (See Figure 2-23). From the PV Preferred Scenario, a detailed list of PV projects has been developed and projects which are likely to be constructed within the timeframe are incorporated into the EA. At this time, PV projects that are assessed in the EA primarily focus on building rooftops and in areas above parking lots and parking facilities.

Table 2-1 PV Preferred Scenario	
Number of Individual PV Systems	178
Total PV Capacity (MW)	38.7.0 MW
Total Annual Energy Production (kWh)	67,096,403 kWh
% Net-Zero Energy	56%

PV System Types	# of sites	Kw_dc
PREFERRED BIPV FINAL	18	3,026
ATRIUM	6	81
GROUND MOUNT ARRAY	7	2,997
GROUND MOUNT - COMPLEX, UTILITY SCALE	2	5,580
HIGH GROUND MOUNT CANOPY	10	3,995
PARKING CANOPY-GROUND "T"-"L"	26	3,543
PARKING CANOPY- GROUND 4-POST	7	3,896
PARKING CANOPY-PKG STRUCT	3	2,566
ROOFTOP	42	3,164
ROOFTOP SUPERSTRUCTURE	56	9,398
WALKWAY	1	428
TOTAL	**178**	**38,674**

PV LAYOUT PREFERRED SCENARIO

- BIPV PREFERRED SCENARIO

PV SYSTEM TYPES

- ATRIUM
- GROUND MOUNT ARRAY
- GROUND MOUNT - COMPLEX, UTILITY SCALE
- HIGH GROUND MOUNT CANOPY
- PARKING CANOPY-GROUND "T"-"L"
- PARKING CANOPY-GROUND 4-POST
- PARKING CANOPY-PKG STRUCT
- ROOFTOP
- ROOFTOP SUPERSTRUCTURE
- WALKWAY
- BUILDING FOOTPRINTS

0 300 600 Feet

Figure 2-23: UHM PV Power Plant Preferred Scenario

Source: G70, UH Mānoa PV Power Plant Project

In order for the UHM to achieve its resiliency goals, all energy generated from the PV systems installed must be utilized (if the % Net Zero Energy is equal or less than 100%). As such, at any given time when the PV systems' energy production may exceed the campus' energy use, such excess energy must be stored. In such cases, energy storage system(s) must be incorporated onto the UHM electrical system to store such excess energy for use by the UHM campus at a later time (e.g., during peak shaving application or overnight energy use).

The PV system installation is anticipated to be accomplished over phases, likely spanning several years. As such, the energy storage build-out would be designed to match the PV phased installation, installing energy storage only at such phase where it is either required to match the PV phased installation, installing energy, or becomes cost-beneficial due to a peak-demand or utility rate arbitrage scenario.

UHM's planning efforts recognize that many types of energy storage technologies exist, such as battery energy storage, compressed air energy storage, and flywheel energy storage, and pumped storage hydropower. The various storage technologies are each at different stages of maturity, or technical and manufacturing readiness, that may range from commercially viable and readily available, to proof-of-concept, to R+D. It is anticipated that the general efficacy and meta, so to speak, of employable technologies, may rapidly change as time advances.

For the purposes of the UHM PV Power Plant Project study, the battery energy storage system was selected for the PV Preferred Scenario as being the most cost-effective and commercially viable option and practical application at the time of this writing. However, this is not to say that future advances of other battery or storage technologies may not become more viable. As the implementation of the UHM's Net Zero Energy initiative may span many years, it is prudent to reevaluate technologies at future project implementation phases.

2.2.5.2 Sewer Lift Station

At this time, Lower Campus sewer improvements are anticipated to include:

1) Reconfiguring the lower campus sewer system to optimize the gravity sewer system.

2) Providing a new pressure and gravity sewer system to discharge added sewer flow to the Dole Street Sewer collection system. This alternative has already been approved by the City DPP WWB. This alternative includes design of a sewage pump station (wet well, dual redundancy pumps, and alarm), gravity sewer system, and sewer force main. Gravity flow from the stadium will flow to a future sewage pump station that is anticipated to be located on the east side of the Ching Complex. Once in the sewage pump station, additional flows would be pumped via sewer force main into an existing Sewer Tunnel Manhole located within Dole Street.

2.3 Development Schedule

The LRDP, which reflects the UH Mānoa Framework for the Future Plan, outlines projects proposed for the 2019-2029 timeframe. It is anticipated that the Proposed Action described

herein will be completed by 2030 whereby it is anticipated that a new LRDP would be developed to guide the UH at that point in time.

2.4 Project Costs

Overall project costs are undetermined currently as the detail and accuracy for projecting such costs are largely contingent upon final design, as well as the conditions of the market as it relates to materials and labor. Hence, it is not possible to put a dollar figure for the likely cost of construction for the various projects at this time as the LRDP projects are anticipated to be built over the next 10 years.

Chapter 3:

Description of Existing Environment, Impacts, and Mitigation Measures

CHAPTER 3: DESCRIPTION OF EXISTING ENVIRONMENT, IMPACTS, AND MITIGATION MEASURES

3. DESCRIPTION OF EXISTING ENVIRONMENT, IMPACTS, AND MITIGATION MEASURES

This chapter describes the existing physical environment within the UHM campus which can be distilled into the four general regions: Lower (Makai) Campus, Central Campus, Upper Central Campus, and the Mauka (Magoon) Campus as discussed in Section 1.3. This chapter also evaluates the potential impacts to various resource categories associated with the implementation of the Proposed Action within these different regions and, where appropriate, provides mitigation measures to address the potential environmental impacts. Each section is organized to provide an integrated discussion of the existing environmental conditions; potential environmental affects (direct and indirect impacts as appropriate); and measures to reduce the effects, where feasible, related to the construction and operation of the Proposed Action.

As required by Section 11-200.1-18(d), this EA identifies and focuses on the direct and indirect physical environment effects of the Proposed Action. It evaluates both short-term and long-term effects. Short-term effects are generally those associated with construction, and long-term effects are generally associated with the operation of the Proposed Action. The following technical, economic, social, cultural, historical, and environmental resource topics are addressed in this chapter:

- Section 3.1, Climate, Greenhouse Gas Emissions, and Climate Change
- Section 3.2, Geology and Topography
- Section 3.3, Soils
- Section 3.4, Hydrology
- Section 3.5, Natural Hazards
- Section 3.6, Natural Environment
- Section 3.7, Historic and Archaeological Resources
- Section 3.8, Cultural Resources and Practices
- Section 3.9, Air Quality
- Section 3.10, Noise
- Section 3.11, Hazardous Materials
- Section 3.12, Traffic and Transportation
- Section 3.13, Visual Resources
- Section 3.14, Socio-Economic Characteristics
- Section 3.15, Public Services and Facilities
- Section 3.16, Infrastructure and Utilities Systems

Sections 3.1 through 3.16 follow the same general format:

- The “Environmental Setting” section presents the existing environmental conditions within the UHM campus and in the surrounding area/region as appropriate. The geographic extent of the environmental setting area evaluated differs among the resource categories depending on the locations of where potential impacts would be expected. This section will also discuss the applicable laws, regulations, plans, and policies as appropriate that are relevant to the resource category.

- The “Environmental Impacts and Mitigation Measures” section identifies the potential impacts that could result from the implementation of the Proposed Action, both short-term and long-term. If there are potential impacts, this section will also describe any feasible mitigation measures that could avoid, minimize, rectify, reduce, or compensate for identified impacts.

3.1 Climate, Greenhouse Gas Emissions, and Climate Change

The climate of O‘ahu is relatively moderate throughout most of the year and is characterized as semi-tropical with two seasons. The summer period runs from May through September and is generally warm and dry, with predominantly northeast trade winds. In contrast, the winter season runs from October through April and is associated with lower temperatures, higher rainfall and less prevalent trade winds.

The UHM campus is situated in lower Mānoa which is generally within the greater region of urban Honolulu that can be characterized as having a climate typically associated with the leeward coastal lowlands on O‘ahu. The climate of the region is characterized by abundant sunshine, persistent trade winds, relatively constant temperatures, moderate humidity, and the infrequency of severe storms. Northeasterly trade winds prevail throughout the year although its frequency varies.

Average daily minimum and maximum temperatures typically range from the mid-60s (degree Fahrenheit) to the mid-80s, depending on the time of the day and the season. Northeasterly trade winds prevail much of the time throughout the island of O‘ahu. These trade winds vary in frequency. Often times they last for weeks on end. Other times they are virtually absent. This is the general result due to the location of the North Pacific high-pressure system. During the spring and summer months, this system is larger, stronger and shifts farther to the north and produces stronger, more persistent trade winds. In the fall and winter months, this high-pressure system degrades and shifts to the southeast, at which time the general wind patterns become weaker and more variable. Typical wind velocities range between 8 and 15 miles per hour.

Rainfall throughout Mānoa Valley varies considerably between the upper and lower areas; therefore, the upper-most and lower-most districts of the UHM campus receive different amounts of rainfall. On average, annual precipitation values of approximately 30 inches can be expected, with most rainfall occurring in conjunction with discrete winter storms between December and April. However, during the spring and summer months, moisture-laden trade winds regularly produce passing showers that contribute significantly to the annual rainfall total.

In recent years it has become widely acknowledged and accepted that the State of Hawai‘i is being impacted by a myriad of climatic changes through rising sea levels, an increase in ocean acidity, changing rainfall patterns, a decrease in stream base flow, changing wind and wave patterns, and changing habitats and species distribution. There is no consensus, however, about the exact nature, magnitude, and timing of how these changes will occur. Generally, there is an expectation of a rise in air and sea surface temperatures, a decrease in the prevailing northeasterly trade winds, a decline in average rainfall resulting in the continued decline in stream base flow, an increase in ocean acidity, and sea level rise (SLR) (discussed in further detail in Section 3.5.1) (UH Sea Grant, 2014).

The rate of warming air temperature in Hawai‘i has quadrupled in the last 40 years to over 0.3°F (0.17°C) per decade. This warming could cause thermal stress for plants and animals, and heat-related illnesses in humans as well as expand the ranges for pathogens and invasive species. Increasing temperatures could lead to changing habitat ranges for various species of wildlife. Global mean temperature is projected to increase by at least 2.7°F (1.5°C) by the end of the century for intermediate to high future scenarios also referred to as representative concentration pathways. The difference between the nightly low and daytime high temperature, an important factor for many terrestrial species, is decreasing more rapidly in Hawai‘i than the global mean (Safeeq et al., 2012). Hawai‘i is projected to continue warming, with a range of +4-5°F (2.2-2.8°C) for high emissions scenarios by the year 2085 (Keener et al., 2013). Endemic bird species, such as the Hawaiian honeycreeper, could decline in population due to the warming of high-elevation forests where risk of avian disease transmission was previously low (Benning et al., 2002).

The strongest ocean warming is projected to be felt in tropical and Northern Hemisphere subtropical regions, with increases up to 3.6°F (2.0°C) in the upper ocean levels above 650 ft. (200 m) by the end of the century. As an island, O‘ahu has both a heavy economic and cultural dependency on the ocean. Sea surface temperatures have warmed between 0.13°F and 0.41°F (0.07°C and 0.23°C) per decade in the Pacific for the last 40 years. This trend is projected to accelerate, warming by 2.3°F to 4.9°F (1.3°C to 2.7°C) before the end of the century. This warming can influence ocean circulation and nutrient distribution having major impacts on ocean habitats such as coral reefs.

Coral reefs are a vital part of the ecosystem and provide a similar niche to the global ecosystem as do plants and trees. The coral reefs have the ability to absorb carbon dioxide and produce oxygen. Although as the water around Hawai‘i continues to warm, rising temperatures harm the algae that live inside the coral. The algae are the main source of nutrients for the coral, a loss of algae weakens the coral and eventually kills them. This process is known as “Coral Bleaching”, because the loss of algae causes the coral to turn white. Events of mass coral bleaching are becoming more frequent throughout Hawai‘i and the rise of sea temperatures has also been linked to coral disease outbreaks. Along with the damaging effects of rising sea temperatures, the increase of ocean acidity also threatens the coral reefs. As ocean acidity increases, corals and shellfish that depend on the minerals in the water weaken. The acidity of the Pacific Ocean has increased by about 25 percent in the past three centuries and is likely to increase another 40 to 50 percent by 2100.

Rainfall in Hawai‘i varies dramatically both temporally and spatially based on trade winds, topography, mid-latitude weather systems, storms and cyclones, El Niño-Southern Oscillation and Pacific Decadal Oscillation phases and much more (Schroeder, 1993). Climate change, natural variability, complex topography, land uses, and other factors combine to present a challenge to the accurate projection of future rainfall and runoff patterns. Trends and projections vary from island to island, and even valley to valley. The overarching past trend across the islands has been a decrease in total rainfall. The projections show a potential increase in frequency of extreme rain events. These projections have implications for stormwater infrastructure, sustainable yield from aquifers, and runoff into coastal waters. Hawai‘i’s total annual average rainfall, represented by the Hawai‘i Rainfall Index, has decreased over the last century (Chu, 1995; Chu and Chen, 2005). Streamflow records also show a decline in base flow by 20-70% over the last century depending on the watershed suggesting a decrease in groundwater levels. Rainfall has become less intense for the western islands (O‘ahu and Kaua‘i) over the last 60 years but more intense for the island of Hawai‘i (east). High intensity rainfall can cause flash flooding, which is common in Hawai‘i due

to the steep terrain and concrete stream channels and has occasionally resulted in multimillion dollars of damage to infrastructure. It can also affect nearshore ecosystems. Hawai‘i has experienced longer droughts in recent years, as all the populated islands show an increasing trend in length of dry periods during 1980-2011, as compared with 1950-1970 (Chu et al., 2010). Prevailing northeasterly trade winds, which drive orographic precipitation on windward coasts, have decreased in frequency since 1973 in Hawai‘i (Collins et al., 2010; Tokinaga et al., 2012; Garza et al., 2012).

It is projected from coarse global models that the southerly main Hawaiian islands (Hawai‘i and Maui) may become wetter towards the end of the 21st century while those in the north (Kaua‘i and O‘ahu) become slightly drier, though rainfall projections for Hawai‘i are still quite uncertain (Keener et al., 2013). Timm et al., 2014 applied a statistical downscaling method described by Timm and Diaz, 2009, in order to find a connection between the large-scale atmospheric circulation over the Pacific with the rainfall over Hawai‘i. It is concluded from the six-model ensemble that the most likely scenario for Hawai‘i by the late 21st century is a 5%-10% reduction of the wet-season precipitation and a 5% increase during the dry season, as a result of changes in the wind field. Other models suggest that summer dry months will become wetter while winter wet months become drier in Hawai‘i. (Lauer et al., 2013; Takahashi et al., 2011). It is still uncertain how this will translate over highly variable terrain in Hawai‘i. If drought events continue to increase, dry areas could see more fire and problems with stressed water supplies.

Research indicates that two centuries of unabated greenhouse gas (GHG) emissions, which includes carbon dioxide, methane, nitrous oxide, and fluorinated gases, from anthropogenic sources is responsible for increases in global atmospheric temperatures and ocean warming over the past century GHGs absorb and “trap” solar radiation instead of reflecting it back into space. The main sources of GHG emissions resulting from human activity are from the following economic sectors, in order from most emissions to least: electricity and heat production; agriculture, forestry and other land-use activities; industrial activity; transportation; other energy production processes; and buildings (IPCC, 2014). In 2014, the United States was responsible for approximately 15 percent of global carbon dioxide emissions (Boden & Anders, 2017).

As assessed by the City and County of Honolulu’s (CCH) Climate Change Commission in June 2018, the State of Hawai‘i’s contribution to GHGs consists of the following:

- In 2007, Hawai‘i’s total greenhouse gas emissions were 24 million metric tons of CO_2 equivalent.
- Total CO_2 emissions have slightly declined in the last decade, largely due to energy efficiency gains in the electricity sector.
- On O‘ahu, 20.8 percent of net sales of electricity from sources were classified as renewable in 2017; the law requires 100 percent by 2045.
- Fossil fuel use for transportation continues to increase.
- Hawai‘i’s CO_2 emissions are 20 percent lower than the national average.
- United States CO_2 emissions per capita are over three (3) times the world average and Hawai‘i’s are approximately twelve (12) times larger than other Pacific Islands.
- Passed in 2018, HB 2182 established a GHG Sequestration Task Force and sets a 2023 deadline for crafting a plan to meet a zero emissions target by 2045.
- Also passed in 2018, HB 1986 directs the State Office of Planning to work with the task force to create a carbon offset program.

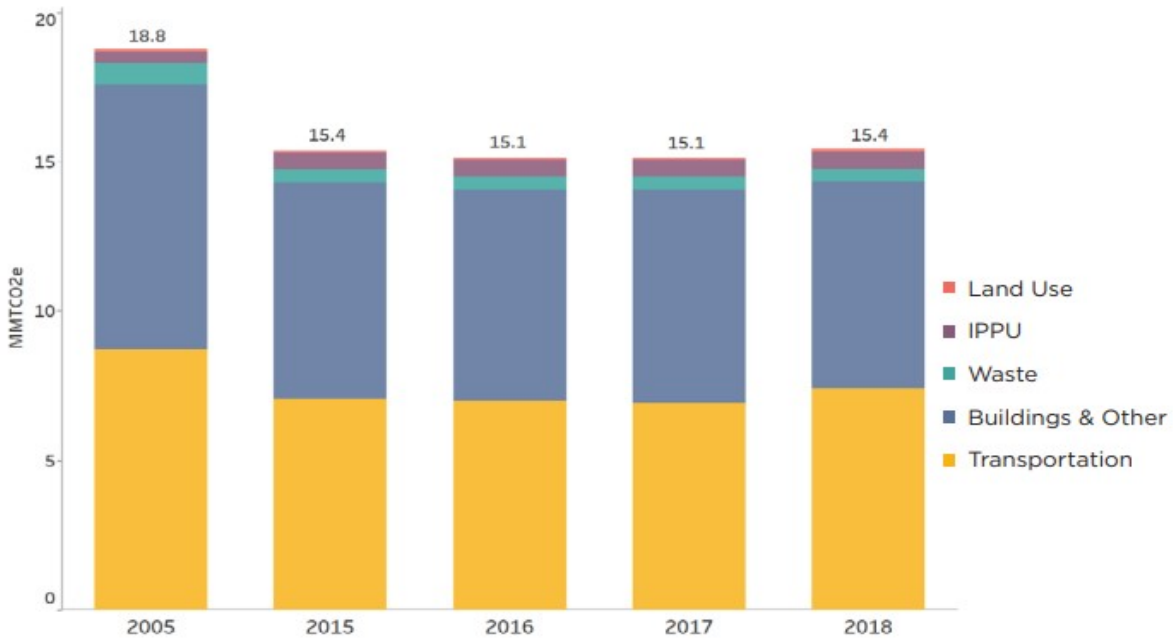
Planning for climate change is challenging as climate change is defined by constantly changing and largely unknown or undefined factors. The risks of climate change, as discussed earlier, include changes in rainfall intensity, SLR, temperature, groundwater levels, saltwater intrusion, and impacts from storm hazards.

The CCH has taken steps to plan for the impacts of climate change as outlined in the CCH's Climate Change Commission's Climate Change Brief which establishes the factual basis and impacts of climate change for the CCH. In July of 2018, the Mayor of CCH issued Directive 18-02, which requires each CCH department and agency to:

- Consider the need for both climate change mitigation and adaptation as pressing and urgent matters;
- Take a proactive approach in both reducing GHG and adapting to impacts caused by SLR; and
- Align programs whenever possible to help protect and prepare the infrastructure, assets, and citizens of the CCH for the physical and economic impacts of climate change.

In June 2021, the CCH City Council passed its first-ever Climate Action Plan (CAP). The CAP is a science-based, community-driven strategy for O'ahu to combat climate change and eliminate GHG emissions. The CAP outlines that the CCH's GHG emissions have declined nearly 18% between 2005 and 2018. However, there was an increase from 2017 to 2018 due to transportation-related GHG emissions. Figure 3-1 below represents the CCH's GHG emissions by sector, which includes Land-Use, Industrial Processes and Product Use (IPPU), Waste, Buildings & Other, and Transportation.

Figure 3-1: CCH's GHG Emissions by Sector For 2005, 2015-2018



**The analysis and forecasting for the CAP was done before the availability of 2018 figures and is therefore based on 2005, 2015, 2016, and 2017 figures.*
**Source: Climate Action Plan (CAP). June 2021.*

In summary, CAP outlines a detailed list of programs, policies, and actions that the CCH can implement, alongside with State and Federal actions, to reduce GHG emissions by 45% over the next five years and reach the CCH's goal to be carbon neutral by 2045.

Impacts and Mitigation Measures

No significant impacts on climate at the Project Site or greater region are anticipated to result from the construction or operation of the Proposed Action. The various improvements associated with Proposed Action will be appropriately designed to take into consideration the context of the surrounding environment and are not anticipated to significantly influence or affect temperatures, wind, or rainfall levels at the Project Site or within the areas abutting the Project Site. The Proposed Action is intended to take advantage of the current climate conditions by creating more open space plazas and transforming the UHM from a commuter campus to a pedestrian-centered campus. Moreover, the Proposed Action is also intended to create more vibrant gathering spaces, both indoors and outdoors, as well as activating the existing natural landscape at the UHM. Hence, the current climatic conditions are beneficial to the Proposed Action

Moreover, the Proposed Action will not exacerbate the impacts associated with climate change at the Project Site, greater region, or State from the development and operation of the Proposed Action. In the short-term, it is anticipated that the various construction activities associated to the Proposed Action will result in the irrevocable release of GHGs. Construction related emissions include tailpipe emissions from construction equipment, delivery trucks, and workers commuting to and from the construction site. It is anticipated that the quantities of GHGs released from construction related activities will be negligible and usage of each piece of equipment would be sporadic and not simultaneous. Moreover, the contractors for the construction of the applicable projects will be required to prepare a dust control plan compliant with the provisions of Chapter 11-60.1, HAR, Air Pollution Control.

In the long-term, it is anticipated that the Proposed Action will provide beneficial impacts to the climate with regards to emissions generated by the UHM campus. As noted in Section 2.1, the UHM seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. The first step for the UHM to achieve its resiliency goals, the Proposed Action incorporates the UHM PV Power Plant Project which explores the feasibility of installation of PV components on all potential surfaces on campus (including on building rooftops and elevations, walkways, courtyards, parking lots, roadways, and unrestricted landscape areas), and considers the use of PV components in all available forms (including standard panels or via Building Integrated PV units such as roof tiles, atriums, canopies, window glazing & siding, etc.) as discussed in Section 2.2.5.2 of this EA. As noted by Table 2-1, the UHM PV Power Plant Project Preferred Scenario would achieve 56% of the Net-Zero Energy goal for the campus.

However, it is acknowledged that the exact nature of how the climate will change in the coming years is unknown. On a broader policy level, new information will continually need to be incorporated within future assessments to identify where efforts should be focused when developing adaptation strategies to climatic changes. It is anticipated that the Proposed Action will be flexible in order to conform with guidance set forth by best practices outlined by policies and research based on the best scientific data at the time as climate change science, technology, and policies evolve over time.

3.2 Geology and Topography

The island of O‘ahu is a volcanic doublet formed by the Wai‘anae Range to the west and the younger Ko‘olau Range to the east. Both are remnants of shield volcanoes, but the term “range” indicates that they have lost most of their original shield outlines and are now long, narrow ridges shaped largely by erosion. Later post-erosional eruptions sent lava down the valleys and resulted in the formation of volcanic cones such as Diamond Head and Tantalus.

The UHM Campus is situated at the mouth of Mānoa Valley on the southeastern slopes of the extinct Ko‘olau Volcano. The geology under the UHM campus is influenced by three post-erosional volcanic vents associated with the larger Honolulu Volcanic Series: Puʻu ʻUalakaʻa (Round Top), Puʻu Kākea (Sugarloaf), and Puʻu ʻŌhiʻa (Tantlus). The Honolulu Volcanic Series did not occur rapidly and at one instance. All three vents are cinder cones derived from Strombolian-type eruptions. The approximately 67,000-year-old flow from Puʻu Kākea spreads out along Mānoa’s valley floor creating a broad and nearly flat surface upon which the UHM was construction (Macdonald, 1983).

The regional topography of the UHM campus gently slopes at approximately 5% between the Mauka and Upper Central Campus areas and the Central and Lower Campus areas. However, in some locations abutting Mānoa Stream, on the lower slope of Waʻahila Ridge, and descending into the Lower Campus (former quarry site), slopes are much steeper (See Figure 3-2). The majority of the Lower Campus is situated within a former quarry that was once mined for construction rock material. The quarry walls are approximately 40 feet above the athletic practice fields situated on Lower Campus. The elevation of the athletic practice fields is approximately 15-21 feet above mean sea level.

Impacts and Mitigation Measures

No significant impacts on geology or topography are anticipated to result from the construction or operation of the Proposed Action. The Proposed Action’s construction will not involve any major land disturbing activities involving mass grading or significant revisions to site contours. The majority of the UHM campus has already been subject to a substantial amount of the development which may have required profuse grading activity to relatively undeveloped areas in the past. In the short-term, relatively minor grading activities may be required at the sites for the New Construction/Replacement of Existing Structures (Net Increase) Projects. However, all necessary permits will be obtained, and all applicable conditions to minimize any potential impacts related to geography and topography will be followed.

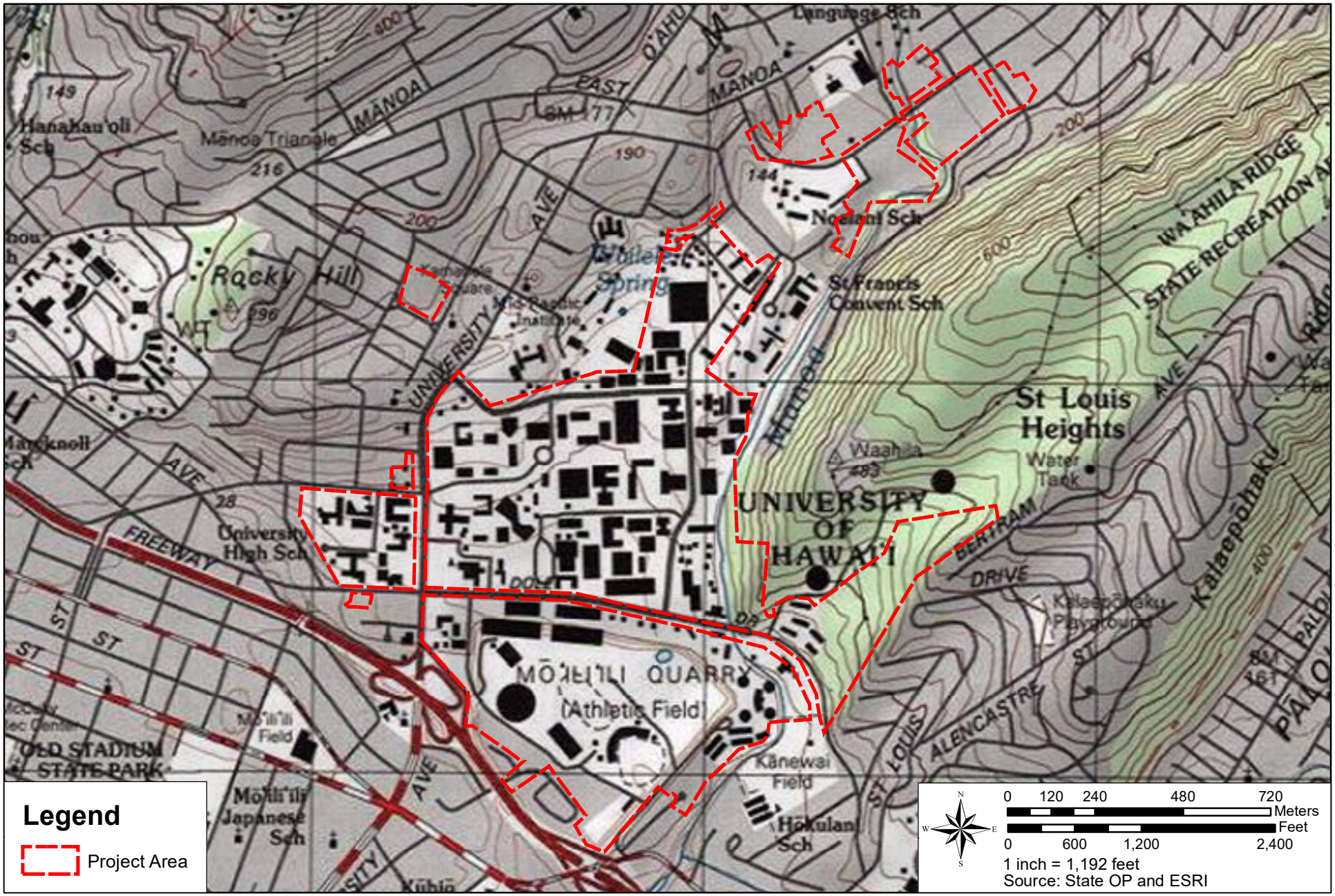


FIGURE 3-2

TOPOGRAPHY MAP

3.3 Soils

Soil information at the UHM campus was gathered from the U.S. Department of Agriculture (USDA) (2001) Soil Survey Geographic (SSURGO) database and soil survey data gathered by Foote et al. (1972) and is discussed by each campus region below.

Lower Campus
Approximately 66-acres of soils within the Lower Campus area is classified as Quarry (QU). The remainder of Lower Campus soils encompass Makiki Stony Clay Loam (MIA), Kawaihapai (KIA), Ewa Silty Clay Loam (EmA), and Kaena Very Stony Clay (KanE) as shown by Figure 3-3.

Central Campus
The predominant soil type for Central Campus is Makiki Stony Clay Loam (MIA). Other portions of Central Campus are characterized by Pamoa Silty Clay (PID), Kaena Very Stony Clay (KanE), Rock Land (rRk), and Tantalus Silty Clay Loam soils as shown on Figure 3-4.

Upper Central Campus & Mauka Campus
Similar to the Central Campus, the predominant soil type for both the Upper Central Campus and Mauka Campus is Makiki Stony Clay Loam (MIA) with other portions characterized by Hanalei Silty Clay (HnA) and Tantalus Silty Clay Loam (TCC) as shown on Figure 3-5 and Figure 3-6.

The soils found at the UHM campus are generally described as follows:

Makiki Stony Clay Loam, 0 to 3 percent slopes (MIA) is well drained and has moderately rapid permeability. This soil is very fine, very hard, very sticky, and very plastic. MIA commonly to underlies urban development.

Rock Land, 0 to 70 percent slopes (rRK), is well drained and has a rapid run-off rate. Rock Land soil is very sticky, very plastic, and has a high shrink swell potential. This type of soil is often found to underlie urban development.

Ka‘ena Very Stony Clay, 10 to 35 percent slopes (KanE), has slow permeability and a moderate to severe erosion hazard. Ka‘ena Very Stony Clay is very sticky, very plastic, and has a high shrink swell potential.

Kawaihāpai Clay Loam, 0 to 2 percent slopes (KIA), is well drained and has moderate permeability. This soil is sticky, plastic, and often found in stream valleys and on alluvial fans.

Tantalus Silty Clay Loam, 8 to 15 percent slopes (TCC), consists of moderately deep, well drained soils. These soils are formed in material weathered from volcanic ash and cinders. They are moderately sloping to very steep.

Hanalei Silty Clay, 0 to 2 percent slopes (HnA), is formed in alluvium from basic igneous rock. The soil is commonly found on bottom lands and low terraces along streams.

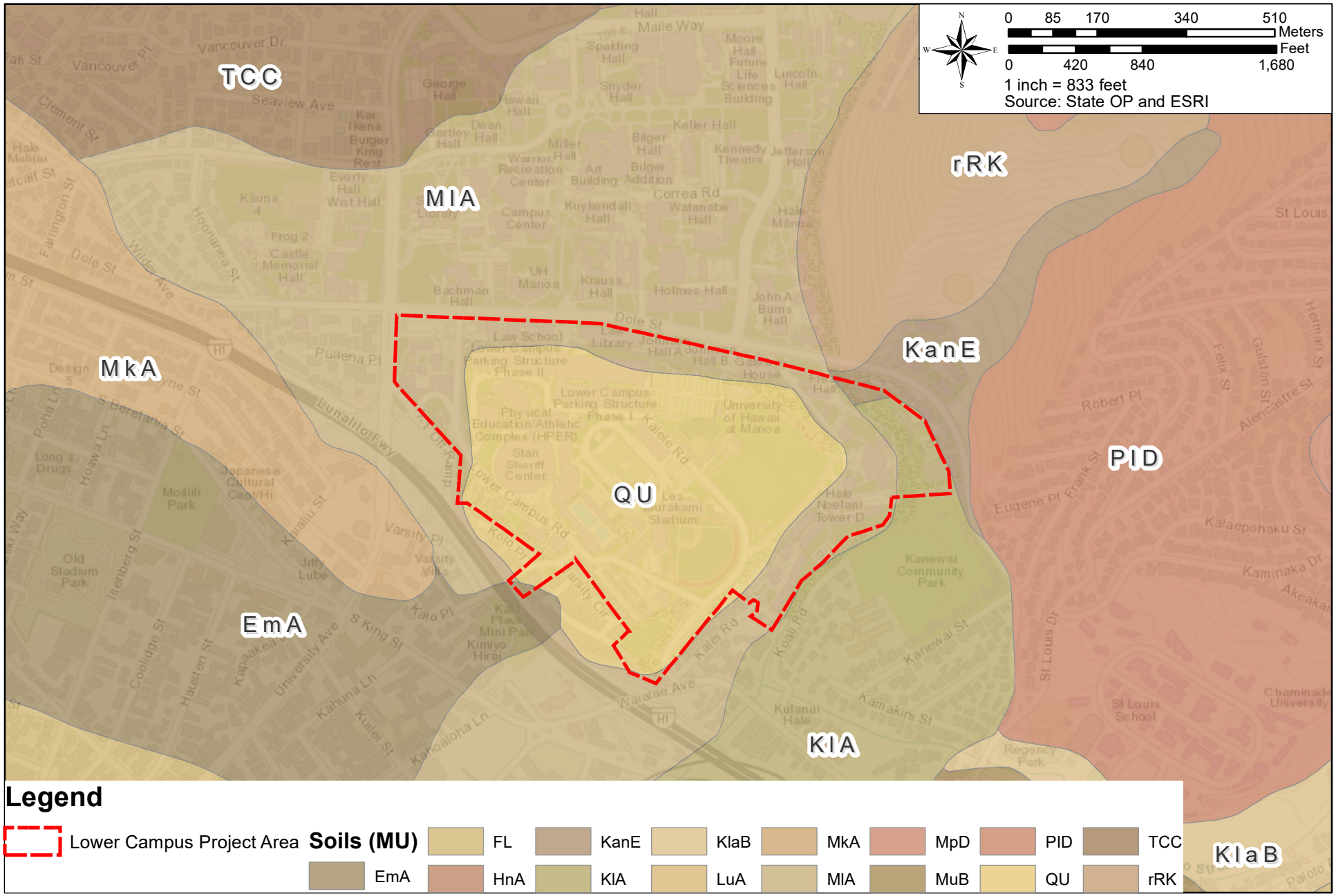


FIGURE 3-3

LOWER CAMPUS SOILS MAP

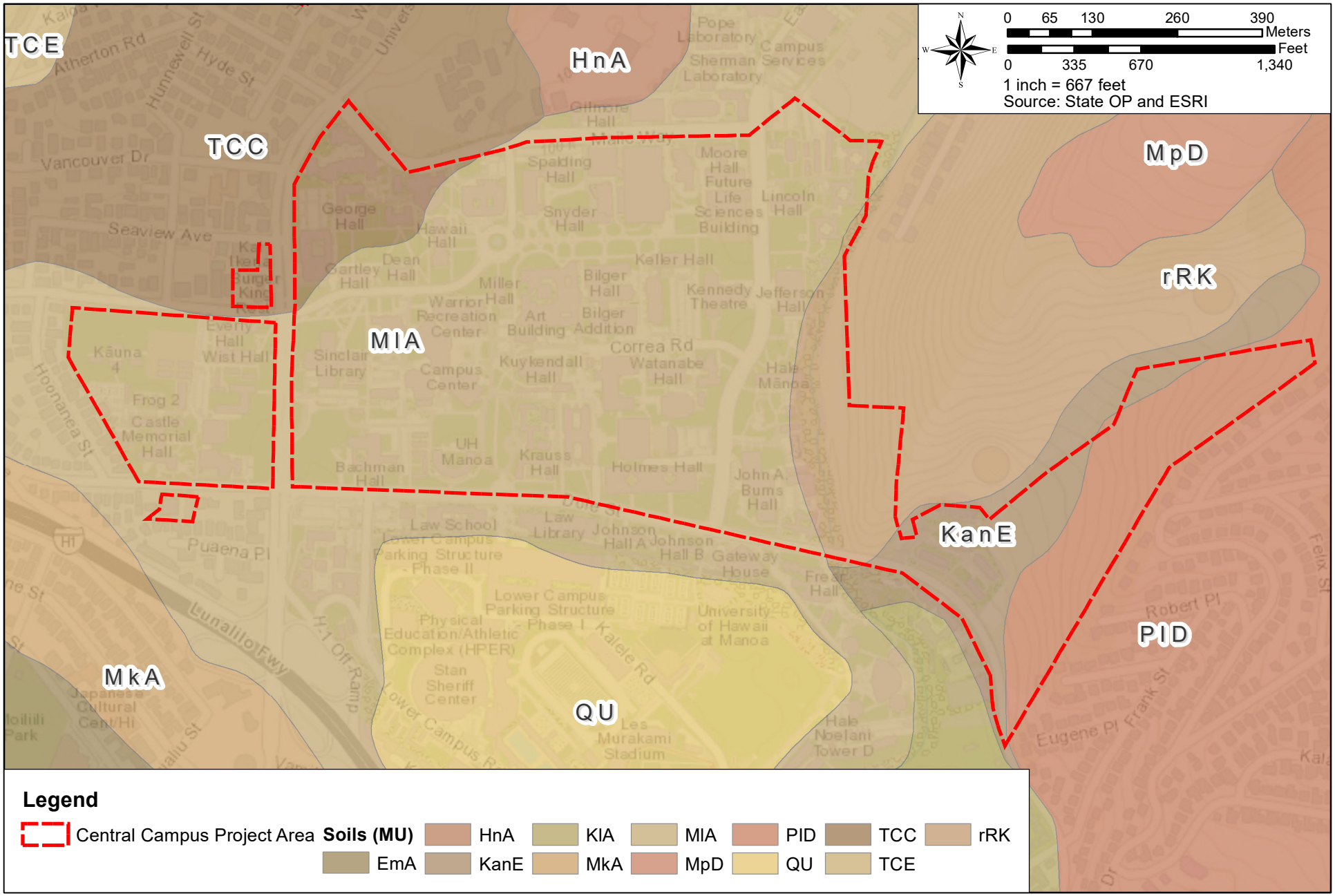


FIGURE 3-4

CENTRAL CAMPUS SOILS MAP

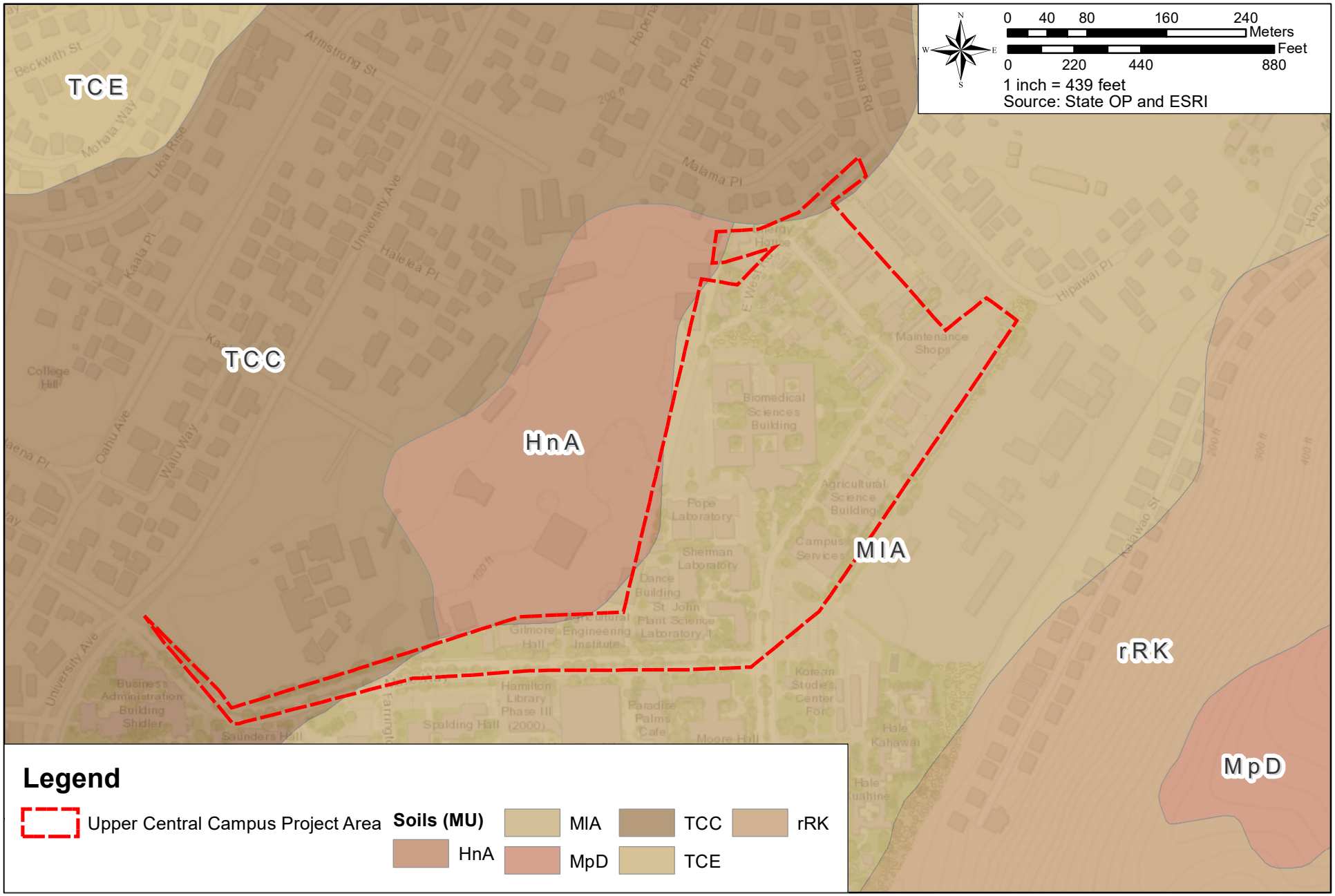


FIGURE 3-5

UPPER CENTRAL CAMPUS SOILS MAP

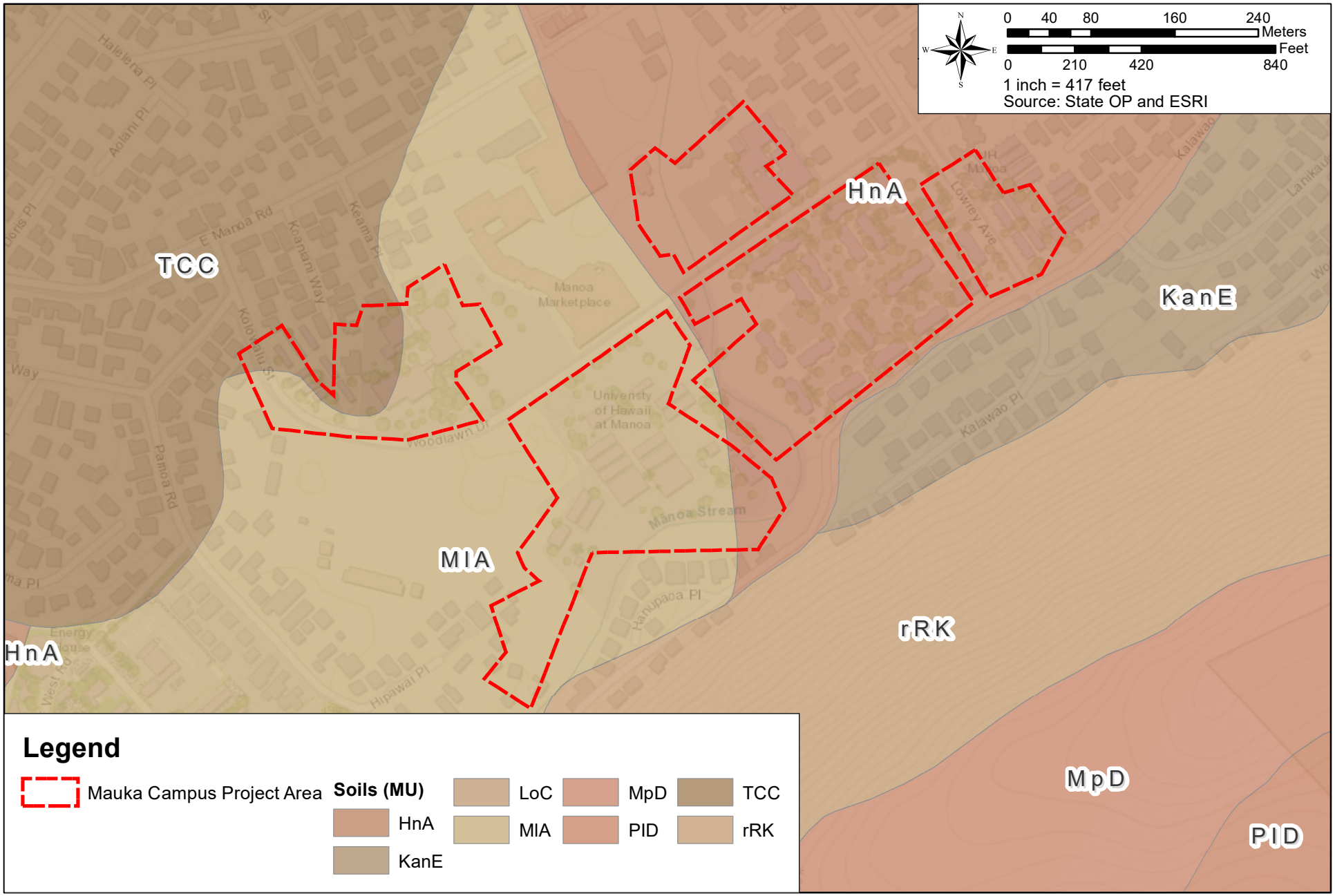


FIGURE 3-6

MAUKA CAMPUS SOILS MAP

Impacts and Mitigation Measures

No significant impacts on soils are anticipated to result from the construction and operation of the Proposed Action. The majority of the UHM campus has already been subject to a substantial amount of the development which may have required profuse grading activity to relatively undeveloped areas in the past. Hence, major land disturbing activities involving mass grading or significant revisions to site contours will not be required.

The construction of the Proposed Action and the various projects is anticipated to implement construction and planting phases to limit the amount of surface disturbance during construction activities. Relatively minor grading activities may be required at the sites for the New Construction/Replacement of Existing Structures (Net Increase) Projects. Earthwork or grading will be proposed to accommodate elevation or finishes requirements such as building sites, roadways, walkways, driveways, planting areas, landscape areas, etc. The design will determine earthwork quantities on excavation or embankment for export or import materials. At that time, geotechnical investigation and recommendation should be available. Coordination will be undertaken with the appropriate agencies during permitting and construction in order to ensure that the Proposed Action will not result in significant impacts with regard to soils and erosion. A National Pollutant Discharge Elimination System (NPDES) permit for stormwater runoff from construction activities would be required as individual and/or cumulative soil disturbances in a project area should it exceed one acre of land area. Any discharges related to the Proposed Action’s construction or operation activities will comply with applicable State Water Quality Standards as specified in HAR, Chapter 11-54 and 11-55 Water Pollution Control, State Department of Health (DOH). All excavation and grading activities will be regulated by applicable provisions of the CCH’s grading ordinances (Chapter 14, Articles 13-16, HAR). Excavation and grading activities will incorporate erosion control best management practices to preserve existing conditions including, but not limited to, 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. Planting of landscaping and stabilization measures will be done as soon as possible on completed areas to help control erosion in the long-term.

3.4 Hydrology

3.4.1 Surface Waters

Mānoa Stream traverses through portions of the Mauka Campus, Central Campus, and Lower Campus. Mānoa Stream runs from the highest point on the Koʻolau Mountain at 3,105 ft., through Mānoa Valley, and discharges into the Ala Wai Canal before entering Māmala Bay (See Figure 3-7). About 60% of the middle and lower reaches of Mānoa Stream have been altered for flood control through the creation of earthen- or concrete-shaped banks and fully concrete-lined channels (AECOS, 2016).

The middle and lower reaches of Mānoa Stream, which encompasses the UHM Campus, are classified pursuant to Section 11-54-03, HAR, as Class 2 inland waters. The objective of Class 2 inland waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation. This includes the protection and propagation of fish, shellfish, and wildlife.

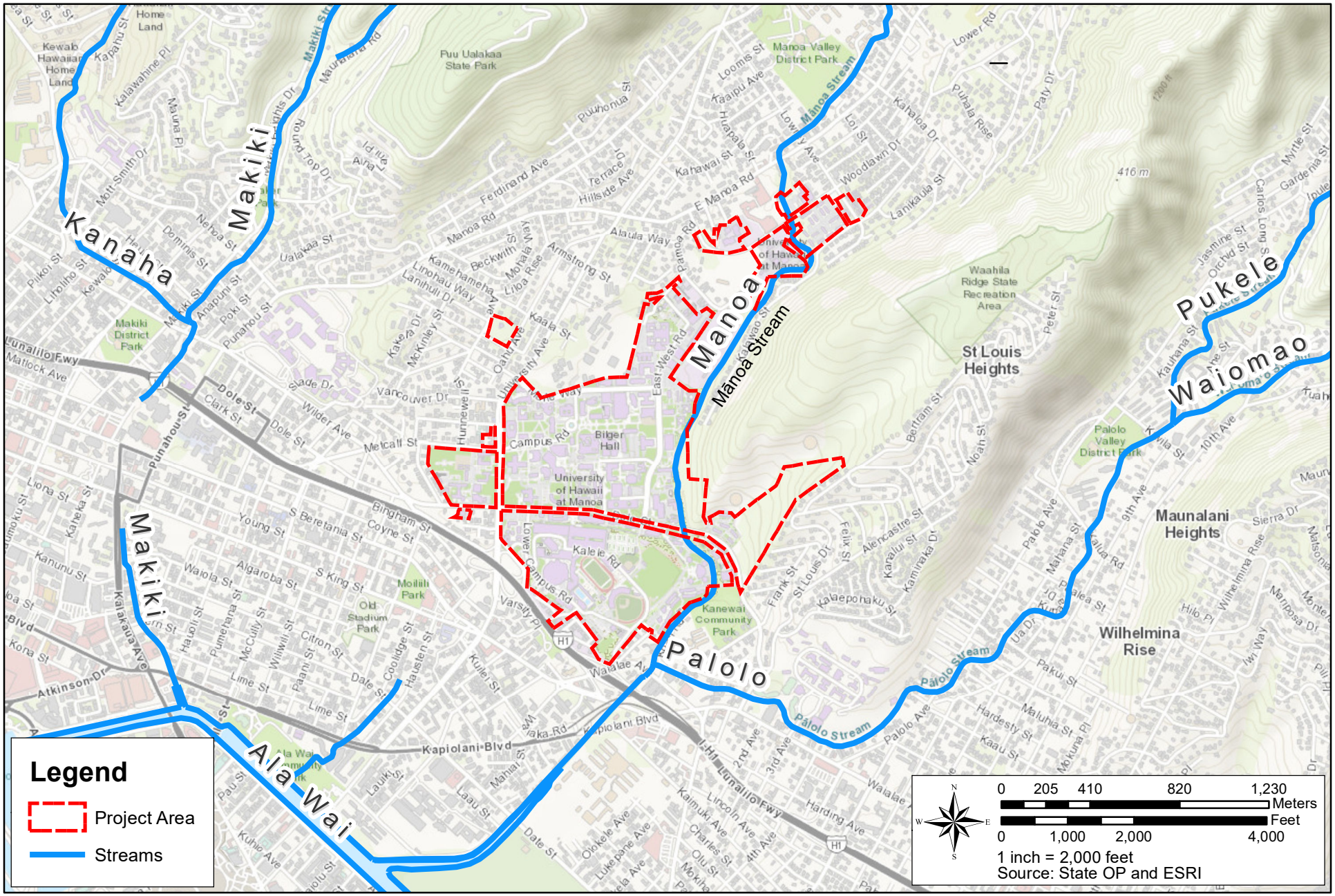


FIGURE 3-7

STREAMS

These waters are banned from receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class of water. Data from the 2014 State of Hawai‘i Water Quality Monitoring and Assessment Report (DOH, 2014) 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 Section 303(d) list.

Lower Campus

On the Lower Campus, Mānoa Stream runs underneath Dole Street and traverses through the Ka Papa Loʻi ʻo Kānewai which is situated at the Kamakakūokalani Center for Hawaiian Studies and runs adjacent to the UHM student housing dormitories. Mānoa Stream is actively used by the Kamakakūokalani Center for Hawaiian Studies for instruction, workshops, and community events to teach Hawaiian culture and perspectives which is discussed more in Section 3.8 below. The stream also separates the UHM campus from the adjacent neighborhood and Kānewai Park to the east.

Central Campus

On the Central Campus, Mānoa Stream runs adjacent to the eastern boundary and traverses through the East-West Center’s facilities at the Jakuan Teahouse and Japanese Garden, which promotes East-West Center’s goal to foster a deeper awareness of Japanese culture and international understanding. The stream eventually runs underneath Dole street before entering Lower Campus, adjacent to the site for the Mixed-Use Housing P3 Project.

Upper Central Campus

No portion of Mānoa Stream runs through Upper Central Campus.

Mauka Campus

On the Mauka Campus, Mānoa Stream runs through the Magoon facilities used for students in the TPSS program at the UHM learn how to manage land, water, crops, and agricultural systems, and portions of the faculty Kauʻiokahaloa Nui Apartment Complex.

Impacts and Mitigation Measures

No significant impacts on surface waters are anticipated to result from the construction and operation of the Proposed Action. Majority of the projects under the Proposed Action are not in proximity to the stream. However, the Mixed-Use Housing P3 Project is adjacent to Mānoa Stream. It should be noted that this project has undergone its own environmental review process, which was determined to have no significant impacts, including impacts to surface waters.

The Mixed-Use Housing P3 Project will adhere to stringent best management practices during construction and operation to preserve surface water resources. Best management practices include, but are not limited to, 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. Planting of landscaping and stabilization measures will be done as soon as possible on completed areas to help control erosion and runoff that could potentially enter the stream in the long-term. There will not any encroachments on any waters of the United States (U.S.), and therefore additional permitting with the Army Corps of Engineers is not required for the Mixed-Use Housing P3 Project. Any discharges related

to the construction or operation of the Proposed Action would comply with applicable State Water Quality Standards as specified in Sections 11-54 and 11-55, HAR. Moreover, an NPDES permit for stormwater runoff from construction activities would be required as individual and/or cumulative soil disturbances in a project area should it exceed one acre of land area. The developer for the Mixed-Use Housing P3 Project also intends to coordinate closely with the Kamakakūokalani Center for Hawaiian Studies and monitor water quality to mitigate any potential impacts that would disrupt the operations of the Ka Papa Loʻi ʻo Kānewai. Moreover, the State of Hawai'i Department of Land and Natural Resources Division of Aquatic Resources should be notified to assess impacts should any event occur during construction that could negatively impact aquatic resources. Examples of this type of event include, but are not limited to, discharge of water contaminated with sediment or liquids, such as oil or gas, into adjacent streams.

3.4.2 Coastal Waters

The nearest coastal water offshore of the UHM campus is Waikīkī Beach at Māmala Bay, located approximately 1.3 miles to the south (See Figure 3-8). Mānoa Stream discharges into the Ala Wai Canal before entering Māmala Bay. The Ala Wai Canal also receives waters from the Palolo and Makiki Streams prior to entering Māmala Bay. Pursuant to Section 11-54, HAR, Water Quality Standards, DOH, the marine waters are classified as Class A, open coastal waters. " Class A waters can be used for "recreational use and aesthetic enjoyment," among other allowable uses compatible with protecting the natural resources in these waters. Section 11-54, HAR, also states that these waters shall not act as receiving waters for any discharge that has not received the best degree of treatment or control compatible with the criteria established for this class.

Impacts and Mitigation Measures

No significant impacts on coastal waters are anticipated to result from the construction and operation of the Proposed Action. The UHM campus is approximately 1.3 miles away from the nearest coastal body water. Mānoa Stream does, however, discharge into the Ala Wai Canal which flows into Māmala Bay.

As noted in Section 3.4.1 above, the Proposed Action will adhere to stringent best management practices during construction and operation to preserve surface water resources, which will ensure that coastal waters are not impacted from the Proposed Action. Best management practices include, but are not limited to, 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. Planting of landscaping and stabilization measures will be done as soon as possible on completed areas to help control erosion and runoff that could potentially enter the stream and flow towards Māmala Bay in the long-term.

3.4.3 Groundwater

The State Department of Land and Natural Resources (DLNR) Commission on Water Resource Management (CWRM) has established a groundwater hydrologic unit and coding system for groundwater resource management. The UHM campus is located within the Honolulu Sector Area which is comprised of six aquifer system areas identified as Waiʻalae – East, Waiʻalae – West, Pālolo, Nuʻuanu, Kalihi and Moanalua.

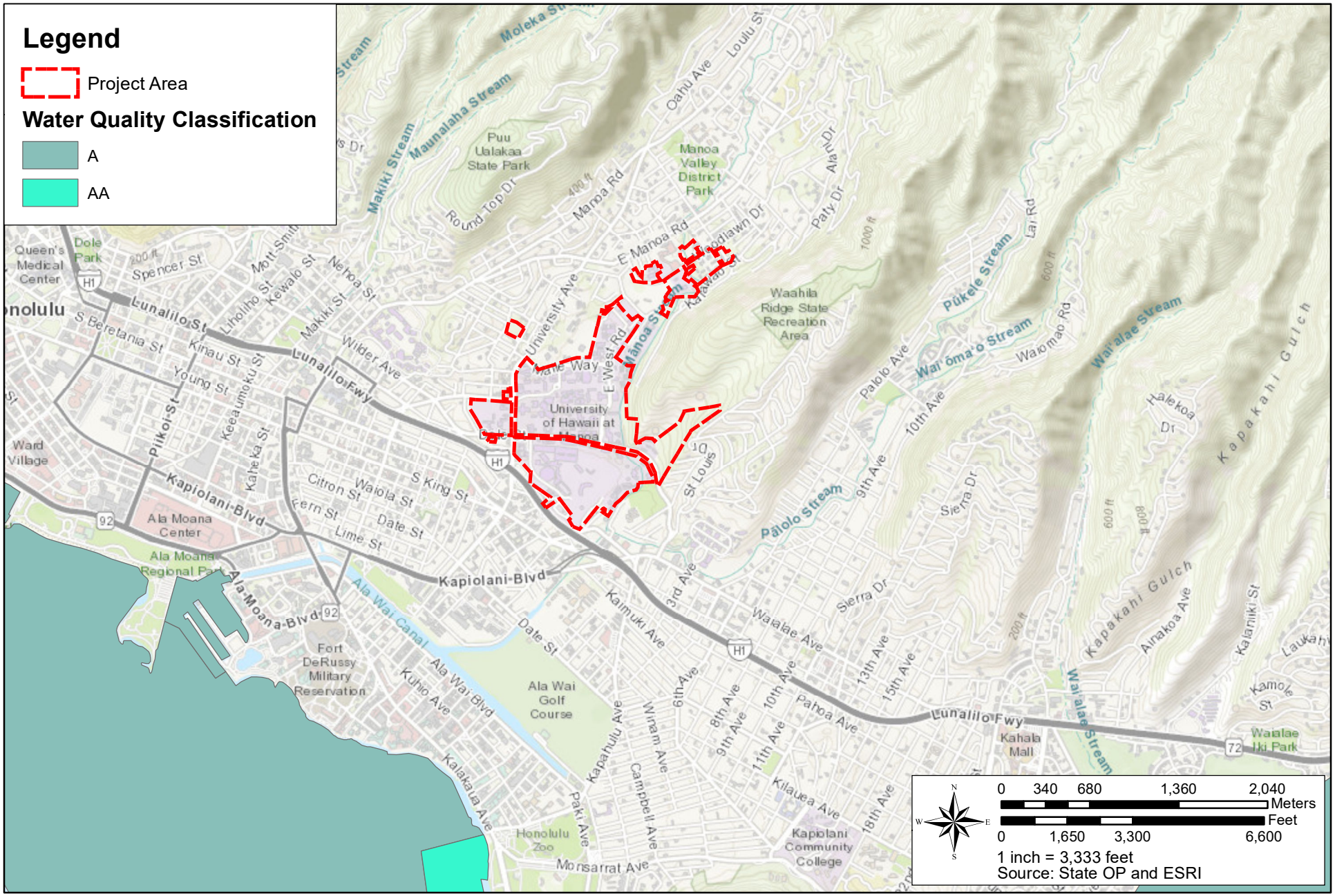


FIGURE 3-8

COASTAL WATER CLASSIFICATION MAP

WILSON OKAMOTO CORPORATION

The majority of the UHM campus is, more specifically, located within the Pālolo Aquifer System (Code-30101) area which has an estimated yield of 5 million gallons per day (mgd) while small portions of the UHM campus are within the Nu'uanu Aquifer System (Code-30102) area which has an estimated yield of 14 mgd (See Figure 3-9). Water demand for the Proposed Action is discussed in detail in Section 3.16.1.

Impacts and Mitigation Measures

No significant impacts on groundwater are anticipated to result from the construction and operation of the Proposed Action. The majority of the UHM campus lies just mauka of the Underground Injection Control Line and the Honolulu Board of Water Supply's No Pass Zone Line, both of which demarcate areas where wastewater disposal facilities would potentially adversely affect potable water supplies in the underlying aquifers. However, the Proposed Action will not include any wastewater injection wells that could result in adverse impacts to the groundwater.

In the short-term, construction activities are not likely to introduce to, nor release from the soils, any materials that could adversely affect the underlying groundwater. Any materials or wastes produced during the operation of the Proposed Action would be handled in compliance with the necessary City and State regulatory requirements.

3.5 Natural Hazards

The Disaster Mitigation Act of 2000 (FEMA, 2000), 44 Code of Federal Regulations, Hazard Mitigation Planning, required States and Counties to have approved hazard mitigation plans as of November 1, 2004 to receive Pre-Disaster Mitigation funding. The development of State and local hazard mitigation plans is critical for maintaining eligibility for future Federal Emergency Management Agency (FEMA) mitigation and disaster recovery funding.

Given Hawai‘i's vulnerability to natural hazards and history of disasters, the State has maintained and implemented a comprehensive, multi-hazard mitigation strategy to reduce loss of life and property damage. This strategy is embodied in the *2018 State Multi-Hazard Mitigation Plan*. The 2018 State Hazard Mitigation Plan identifies the major natural hazards that affect the State, assesses the risk that each hazard poses, analyzes the vulnerability of the State's population, property and infrastructure to the specific hazard, and recommends actions that can be taken to reduce the risk and vulnerability to the hazard. The State Hazard Mitigation Plan also contains a description of programs, policy, statues and regulations applicable to hazard mitigation. It should be noted that the 2023 update to this plan has begun and is expected to be released at the end of 2023.

The CCH also maintains a Local Hazard Mitigation Plan, that the State of Hawai'i Emergency Management Agency reviews in accordance with The Disaster Mitigation Act of 2000 (FEMA, 2000), 44 Code of Federal Regulations and coordinates with the CCH to ensure compliance with the federal regulations.

The identified major natural hazards that could affect the State, as well as the CCH are Climate Change Effects (including SLR/coastal erosion), floods, tsunamis, strong windstorms/hurricanes, earthquakes, landslides/rockfalls, wildfires, and volcanic hazards.

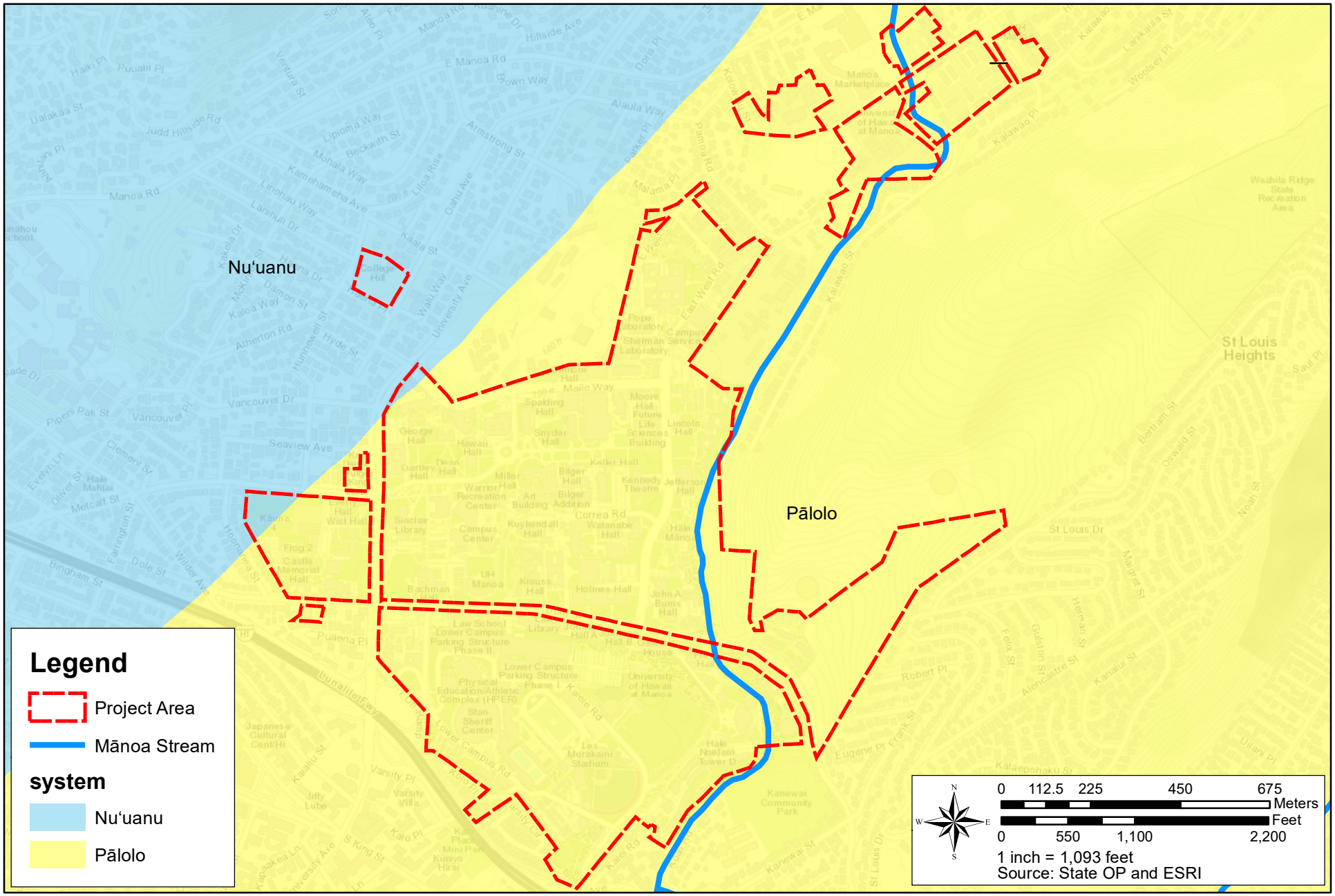


FIGURE 3-9

AQUIFER MAP

3.5.1 Sea Level Rise

Climate change and its impacts are discussed in detail in Section 3.1 above. This section will focus on SLR and coastal erosion impacts.

The island of O‘ahu is susceptible to flooding and SLR as it is home to the State's most populous city, Honolulu, which also serves as the State’s capital. With approximately one million residents, O‘ahu accounts for approximately 70% of the State’s entire population. Thus, O‘ahu also possesses many of the State’s critical resources, infrastructure, and services. A major impact from SLR on O‘ahu could reverberate and result in major economic and social impacts for the islands and communities throughout the State.

Elevated water levels in the spring and summer of 2017 provided a glimpse of the near future when coastal flooding events are expected to occur more frequently and severely with continued SLR. Findings by the UH Sea level Center showed that the 2017 anomalously high-water levels resulted from an unprecedented combination of Pacific wide climate and ocean variability. The water levels in 2017 presented record highs. The rise in sea level caused localized flooding and coastal erosion throughout the State during the spring and summer of 2017.

Although coastal erosion is a naturally occurring event, as sea level continues to rise, the rate at which coastal erosion occurs is increasing which will have more severe impacts. Over the next 30 to 70 years, as sea level rises, homes and businesses located on or near the shoreline throughout the State will become exposed to chronic flooding.

Sea level is rising at increasing rates due to global warming of the atmosphere and oceans and melting of the glaciers and ice sheets. Rising sea level and projections of stronger and more frequent El Niño events and tropical cyclones in water surrounding Hawai‘i indicate a growing vulnerability to coastal flooding and erosion. The Hawai‘i Sea Level Rise Vulnerability and Adaptation Report (2017) modeled exposure to chronic coastal flooding and erosion using projections from the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report (IPCC, 2014) where the high-end scenario was up to 3.2-ft of sea level rise by the end of the century (Courtney et al., 2020). For O‘ahu, the exposure area (SLR-XA) with 3.2 ft. of SLR is based on modeling passive inundation, coastal erosion, and annual high wave runup. According to a recent National Oceanic and Atmospheric Administration (NOAA) report, global SLR in the range of 6.4 ft. (2.0 m) to 8.8 ft (2.7 m) is “physically plausible” by the end of this century (Sweet et. al, 2017). The CCH Climate Commission issued SLR guidance for the County to use for areas exposed to 3.2 ft. of SLR as a planning benchmark for most developments, with consideration of 6 ft. of SLR as a planning benchmark for critical infrastructure with long expected lifespans and low risk tolerance (Climate Change Commission, 2018). The UHM campus is not located within the 3.2 ft. or 6 ft. SLR exposure areas (See Figure 3-10).

Impacts and Mitigation Measures

No significant impacts on climate at the UHM campus or greater region are anticipated to result from the construction or operation of the Proposed Action. The UHM campus is approximately 1.3 miles away from the nearest shoreline and is not within the predicted SLR exposure areas. However, much of the critical resources, infrastructure, and services that serve the UHM campus, are within the exposure areas.

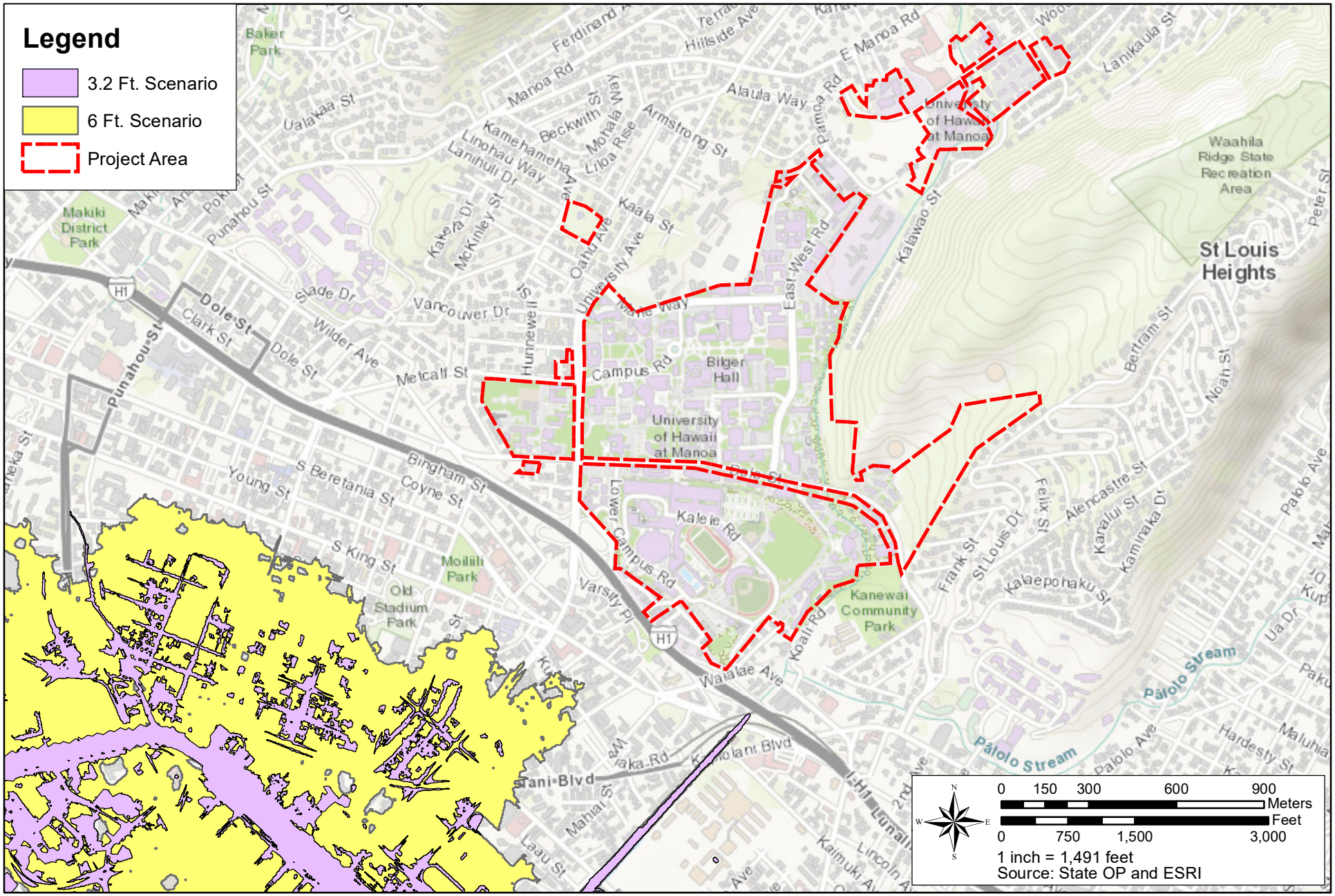


FIGURE 3-10

SEA LEVEL RISE EXPOSURE MAP

In general, the consensus of the scientific community and from the studies mentioned above it is generally accepted that unless drastic measures are taken by governments on a global scale, sea-level will continue to rise as a result of climate change. On a broader policy level, new information will continually need to be incorporated within future assessments to identify where efforts should be focused when developing adaptation strategies to SLR impacts. It is anticipated that the Proposed Action will be flexible in order to conform with guidance set forth by best practices outlined by policies and research based on the best scientific data at the time as climate change science, technology, and policies evolve over time.

3.5.2 Flood and Tsunami Hazard

Floods are the temporary inundation of land from excessive rainfall or other sources. Although floods are caused by natural events, most flood damage is a result of human occupation and development of lands that are susceptible to flooding without adequate protection. The CCH is vulnerable to flooding from storms, storm surge, high surf, and on rarer occasions, tsunamis. Every year flooding causes millions of dollars of damage. In the CCH, from about 1915 to 2018, floods caused by rainstorms, tsunamis, and hurricanes have claimed more than 140 lives and inflicted more than $200 million dollars of direct and indirect damage (DEM, 2020). In fact, as mentioned in Section 2.2.2.5, a flash flood occurred in 2004 in Mānoa Valley and significantly damaged the ground floor of the Hamilton Library, destroying the Library & Information Science Program as well as thousands of government documents, map collections, systems and cataloging and acquisitions services. All the library file servers were also lost during the 2004 flood. According to the *Multi-Hazard Pre-Disaster Mitigation Plan For the City & County of Honolulu*, this flash flood resulted in approximately $85 million dollars (in 1998 dollars) worth of damage. The United States Army Corps of Engineers (USACE) conducted a post-flood, rainfall-runoff and stream hydraulic computer model of Mānoa Stream. The model resuls indicated that Mānoa Stream, between Woodlawn and Kahaloa Drives, had insufficient channel capacity to contain the flood waters caused by the 2004 storm event. Flood damage was also further aggregated by debris clogged at the East Mānoa Road and Woodlawn Drive bridges over Mānoa Stream. Drainage channels have since been improved and repaired so that major flood impacts are not expected to pose imminent threats to the area.

According to the Flood Insurance Rate Maps (FIRM) for the area, prepared by the Federal Emergency Management Agency (FEMA), the majority of the UHM campus, other than the area in proximity to Mānoa Stream, are situated within Zone X, an area determined to be outside of 500-year floodplain (See Figure 3-11). The areas in proximity to Mānoa Stream are situated in Zone AE, a high risk area for flooding determined to be within the 100-year floodplain. However, it should be noted that all projects under the LRDP are within Zone X, and outside Zone AE.

Lower Campus

On the Lower Campus, Mānoa Stream runs underneath Dole Street and traverses through the Ka Papa Loʻi ʻo Kānewai which is situated at the Kamakakūokalani Center for Hawaiian Studies and runs adjacent to the UHM student housing dormitories. Portions of the UHM student housing including the Hale Wainani Apartment Complex, Hale Noelani Apartment Complex, Hale Aloha Towers and Hale Aloha Café, and the the Kamakakūokalani Center for Hawaiian Studies are situated in Zone AE. The remainder of Lower Campus is within Zone X.

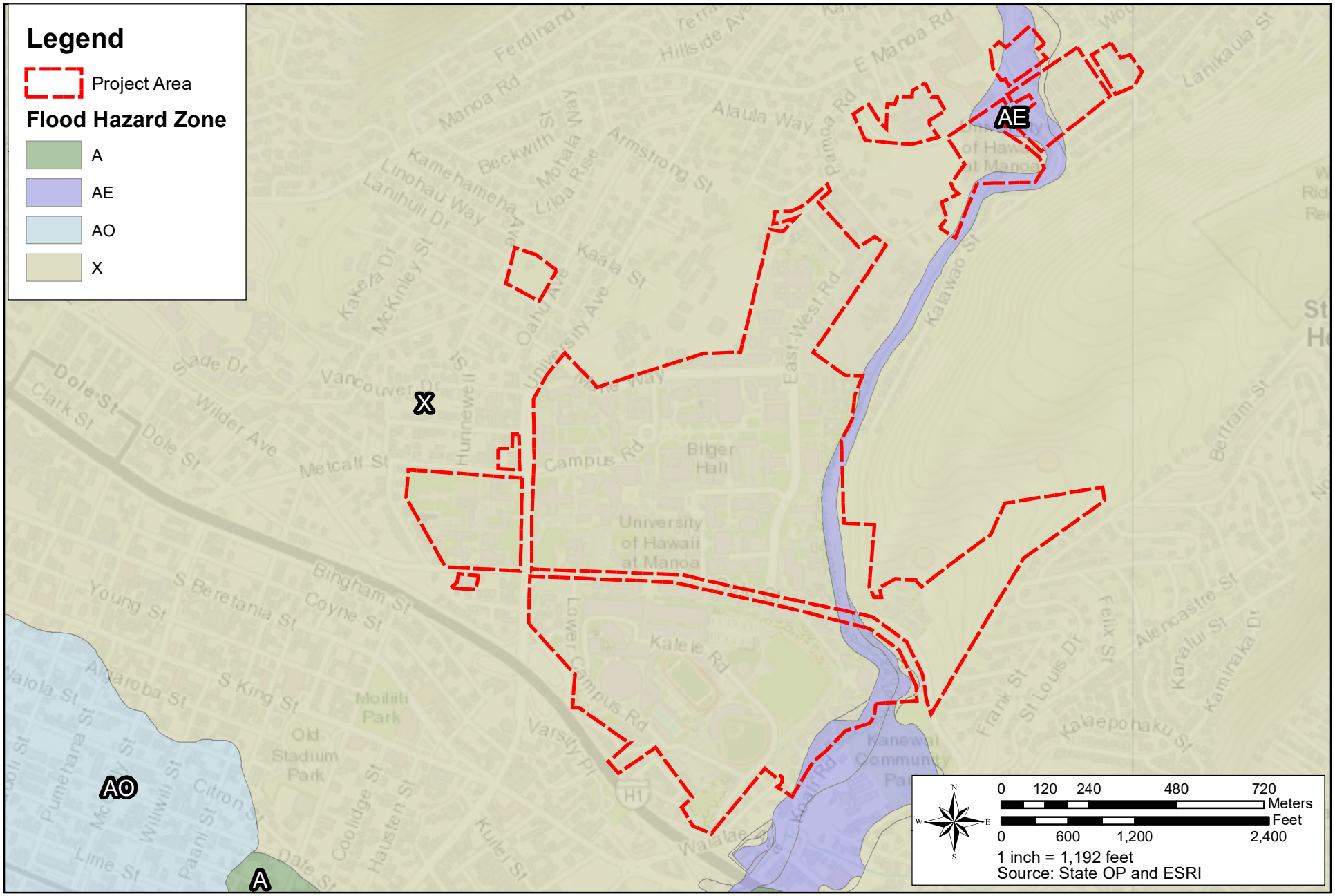


FIGURE 3-11

FLOOD INSURANCE RATE MAP

Central Campus
On the Central Campus, Mānoa Stream runs adjacent to the eastern boundary and traverses through the East-West Center's facilities at the Jakuan Teahouse and Japanese Garden. Portions of the East-West Center's facilities, including Hale Mānoa and the Jakuan Teahouse and Japanese Garden, are within Zone AE. The remainder of Central Campus in within Zone X.

Upper Central Campus
No portion of Mānoa Stream runs through Upper Central Campus. Upper Central Campus is completely within Zone X.

Mauka Campus
On the Mauka Campus, Mānoa Stream runs through the Magoon facilities used for students in the TPSS program at the UHM learn how to manage land, water, crops, and agricultural systems, and portions of the faculty Kauʻiokahaloa Nui Apartment Complex. Portions of these areas are within both the Zone AE and Zone X designations.

With regards the tsunami hazards, the UHM campus is approximately 1.3 miles away from the nearest shoreline and is entirely within the CCH's tsunami evacuation safe zone (See Figure 3-12).

Impacts and Mitigation Measures
No significant impacts on flood hazards at the UHM campus or greater region are anticipated to result from the construction or operation of the Proposed Action. All projects under the LRDP are within Zone X, and outside Zone AE. Hence, no construction activities or operations would occur within Zone AE. In the short-term, applicable best management practices would be implemented including, but not limited to, 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 so that impacts of flooding are not exacerbated from construction. In the long-term, it is anticipated that the New Construction/Replacement of Existing Structures (Net Increase) Projects, including Mixed-Use Housing P3 Project (nearest to Mānoa Stream), will incorporate applicable drainage improvements (discussed in further detail in Section 3.16.3) and appropriate building codes related to flooding impacts. It should also be noted that the projects under the LRDP will not result in an increase of impervious surfaces. All projects being undertaken will occur in already developed areas on the UHM campus. In fact, the demolition projects will result in more open space around the UHM campus, creating more pervious surfaces which can have beneficial impacts with regards to flooding. It should also be noted that during storm conditions, all construction should be halted to prevent impacts to the watershed.

As it relates to tsunami impacts, the UHM campus is approximately 1.3 miles away from the nearest shoreline and is entirely within the CCH's tsunami evacuation safe zone and will not cause impacts to the tsunami evacuation areas nor exacerbate the impacts of a tsunami.

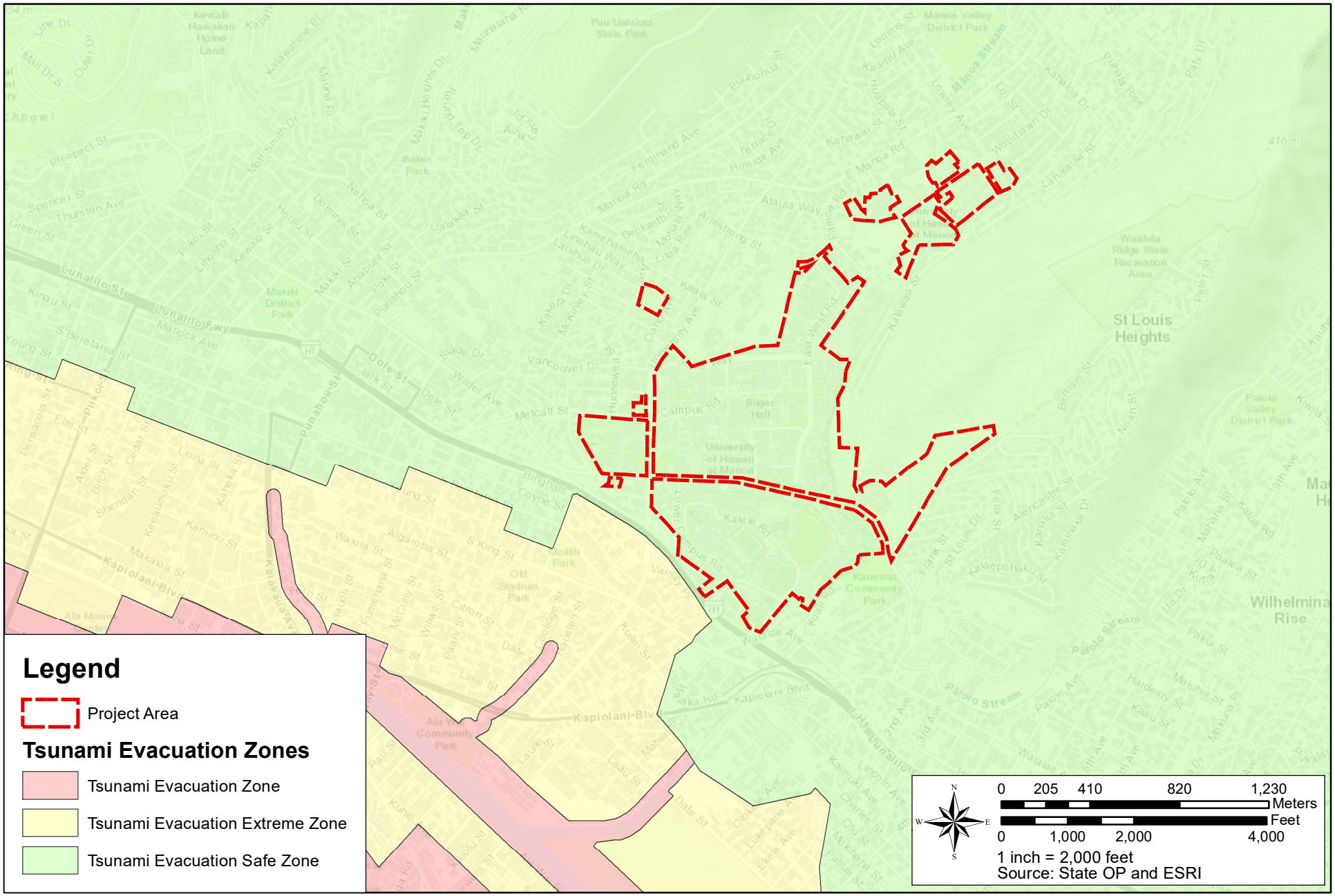


FIGURE 3-12

TSUNAMI EVACUATION ZONES MAP

3.5.3 Hurricane and Wind Hazard

The Hawaiian Islands are seasonally affected by Pacific hurricanes from the late summer to early winter months. The State has been affected twice since 1982 by significant hurricanes, ‘Iwa in 1982 and ‘Iniki in 1992. During hurricanes and storm conditions, high winds caused strong uplift forces on structures, particularly on roofs. Wind-driven materials and debris can attain high velocity and cause devastating property damage and harm to life and limb. Along the coastline, a surge of water, topped by battering waves can move ashore into low lying coastal areas. However, it is difficult to predict how hurricane-induced storm surge may impact a specific location due to differences in atmospheric pressure, tidal stage, coastal topography, and location relative to the eye of the hurricane. It is difficult to predict these natural occurrences, but it is reasonable to assume that future events will occur. The UHM campus is, however, no more or less vulnerable than the rest of the island to the destructive winds and torrential rains associated with hurricanes.

Impacts and Mitigation Measures

The potential for hurricanes, while relatively rare, is present across the State of Hawai‘i. The Proposed Action’s construction activities could potentially exacerbate the effect of hurricanes if loose materials are not secured prior to the event of a storm and become flying debris. To minimize this hazard, construction materials and equipment would be stored properly when not in use, consistent with construction best management practices.

To safeguard against hurricane damage in the long-term, the Proposed Action improvements would be designed in compliance with American Society of Civil Engineers and International Building Code standards for wind exposure.

3.5.4 Earthquake and Seismic Hazards

Seismic hazards are those related to ground shaking. Landslides, ground cracks, rock falls and tsunamis are all considered as seismic hazards. Although difficult to predict, an earthquake of sufficient magnitude causing structural or other property damage may occur in the future. However, except for the island of Hawai‘i, the Hawaiian Islands are not situated in a high seismic area subject to numerous earthquakes (Macdonald et al. 1983). Thousands of earthquakes occur every year in the State of Hawai‘i. Earthquakes in the Hawaiian Islands are associated with volcanic eruptions or tectonic movements. Most of these earthquakes are closely related to volcanic processes and are so small they can only be detected by seismometers. One of the larger and more recent earthquakes occurred offshore of Puakō, Hawai‘i in 2006. The earthquake measured 6.7 on the Richter Scale and caused minor damages to structures and buildings on the island of O‘ahu.

Engineers and other professionals have created a system of classifying seismic hazards on the basis of the expected strength of ground shaking and the probability of the shaking actually occurring within a specified time. The results are included in the International Building Code (IBC) seismic provisions. The IBC classifies the likelihood of seismic activity into zones ranging from 0 to 4. Seismic Zone 0 represents no chance of severe ground shaking and Seismic Zone 4 represents a 10 percent chance of severe shaking in a 50-year interval. The Project Site lies within the region of O‘ahu classified as Seismic Zone 2A under the IBC. Strong shaking is associated with earthquakes in this zone and may result in negligible damage to buildings in good design and construction, slight to moderate damage in well-built ordinary structures, and considerable

damage in poorly built structures. Thus, Mānoa Valley is assessed to have low vulnerability to earthquakes.

Volcanic hazards on O‘ahu are considered minimal due to the extinct status of former volcanoes; however, the effects of earthquakes occurring on the islands of Hawai‘i and Maui may be felt on the island of O‘ahu.

Impacts and Mitigation Measures

O‘ahu has not experienced significant seismic events in the modern era. The development of the Proposed Action would be subject to adherence to strict design requirements, to ensure that all developments of the Proposed Action would comply with geotechnical recommendations for seismic hazards and meet prevailing building codes by incorporating specifications to reduce vulnerability to earthquakes at that time.

3.5.5 Landslides and Rockfall Hazards

A landslide occurs when gravity forces land downward, often due to precipitation, runoff, or ground saturation. Debris flows, sometimes referred to as mudslides, mudflows, lahars, or debris avalanches, are common types of fast-moving landslides and occur in a wide variety of environments. Flows are characterized by shear strains distributed throughout the mass of material. Flows are distinguished from slides by high water content and the distribution of velocities resembles that of viscous fluids. These flows are a form of rapid mass movement in which loose soils, rocks, and organized matter, combined with air and water, form a slurry that flows downslope. These flows generally occur during periods of intense rainfall (3 inches in a peak 6-hour period) (DEM, 2020). Several features on land may be noticeable prior to a landslide including but not limited to: springs, seeps, or saturated ground appears in areas usually not wet; new cracks or unusual bulges in the ground, street pavements, or sidewalks; and soil moves away from foundations.

In 2012, Geolabs, INC. prepared the *Revised Geotechnical Engineering Evaluation Phase III – Rockslide Potential Inspections Rockfall Hazard Rating System Database Update No. 1 Project No. 01154 Various Locations, Oahu, Hawaii* for CCH Department of Design and Construction, which included study areas in Mānoa in proximity to the UHM campus on Dole Street to assess the potential for rockfall events on the roadway (nearest being along Dole between the Kamakakūokalani Center for Hawaiian Studies and the Wa'ahila Faculty Housing Complex). The three areas studied along Dole Street were assessed to have ratings of “A,” “B,” and “B.” Class “A” was considered to have a high potential for rockfall events, while Class “B” was considered to have a moderate potential for a rockfall event.

Impacts and Mitigation Measures

The Proposed Action is not anticipated to have impacts that could result in landslide or rockfall events as the UHM campus is relatively flat and broad. Moreover, the Proposed Action’s construction will not involve any major land disturbing activities involving mass grading or significant revisions to site contours. However, some facilities abut Wa'ahila Ridge which could be impacted from a landslide or rockfall event. The existing hillslope inventory and database should be continually updated to reflect changes in slope that could affect the UHM campus.

3.5.6 Wildfire Hazards

Wildfires can threaten life and property, but they can also harm the environment and threaten important natural resources such as endangered species. While sometimes caused by lightning, nine out of ten wildfires are human-caused. Put simply, "wildfire" is the term applied to any unwanted and unplanned fire burning in forest, shrub or grass regardless of whether it is naturally or human induced (DEM, 2020).

On a global basis, the number of wildfires has significantly increased in the last decades. Such increase can be explained by four key factors:

1. Past fire suppression policies, including one of "total suppression," which allowed for the accumulation of fuel in the form fallen leaves, branches, and excessive plant overgrowth in forest and wild land areas.
2. Increasingly dry, hot weather.
3. Changing weather patterns.
4. Increased residential development in the wild land/urban interface

All the Hawaiian Islands are susceptible to wildfires, especially during prolonged drought and high winds. In recent years, the average annual cost to suppress wildfires in Hawai'i is about $1,100,000 - making it a Statewide risk (DEM, 2020). The greatest danger of fire is where the wildland borders urban areas. Through August, 2018, wildfires in Hawai'i have burned 30,000 acres (about double the annual average). Historically, the majority of these fires have been directly caused by humans, either directly or by negligence. According to a map produced by Trauernicht (2014), Wa'ahila Ridge, abutting the UHM campus is considered to be within a high-risk area for wildfires. In fact several brush fires have occurred in the past along Wa'ahila Ridge, near the UHM campus, with the most recent occurring in 2020. The UHM campus itself is situated within a low-risk area for wildfires.

Impacts and Mitigation Measures

The Proposed Action is not anticipated to have impacts that could result in wildfire events as the UHM campus is relatively well irrigated and is considered to be within a low-risk area. However, the UHM campus abuts Wa'ahila Ridge, a high-risk area for wildfires, which could impact the UHM campus if not properly contained. The State Department of Land and Natural Resources-Division of Forestry and Wildlife (DLNR-DOFAW) has adopted a Fire Management Handbook, which specifies its standards for prevention, pre-suppression, and suppression. The document provides a structured approach in providing for public/firefighter safety and minimizing damage to Hawai'i's environment. Funding for the fire management program is provided by the State's general fund and federal cost share programs through the U.S. Forest Service. These programs include the Rural Community Fire Protection and Rural Fire Protection and Control programs. Additionally, the DLNR-DOFAW is a key agency within the State who can trigger provisions of the Stafford Act (Fire Suppression Assistance) which provides for FEMA funding assistance in situations where forest and grass fires on public or private lands threaten a major disaster to communities and economies. For DLNR-DOFAW to meet its legal fire protection mandate for State-owned lands and honor its partnership with other fire services, DLNR-DOFAW negotiated with its local fire departments and established a cooperative mechanism for prevention, pre-suppression and suppression measures by way of the current Memorandum of Agreements.

3.5.7 Volcanic Hazards

The island of Oʻahu is formed from two principal volcanoes: Waiʻanae and Koʻolau about 2.2 – 3.8 million years and 1.8 – 2.6 million years ago respectively. Oʻahu is also riddled with a number of more recent smaller “rejuvenation” vents such as Diamond Head, Koko head, Punchbowl and many others, which are believed to have occurred between 70,000 and 500,000 years ago. As noted in Section 3.5.4, volcanic hazards on Oʻahu are considered minimal due to the extinct status of former volcanoes.

The Island of Hawaiʻi is composed of five volcanoes, two of which (Mauna Loa and Kīlauea) have been very active in the past 100 years and pose the most immediate threat to life and property. A third volcano, Hualalai, last erupted in 1801 and has the potential to erupt again within our lifetime. The other two are dormant. Mauna Kea last erupted approximately 3,500 years ago and is considered dormant but not extinct. Kohala, considered extinct, is the oldest volcano on the island and last erupted approximately 60,000 years ago. Hawaiian volcanoes are not as explosive as continental margin volcanoes (e.g., Rainier, Mt. St. Helens, Mt. Shasta) and are characterized by relatively quiet outflow of relatively fluid lava, therefore the probability of harmful volcanic rock debris and ashfall on Oʻahu from the volcanoes on Maui and Hawaiʻi is negligible. Consequently, the only credible volcanic hazard on Oʻahu is “VOG,” short for “volcanic gas” or “volcanic smog,” resulting from ongoing eruptions on Hawaiʻi.

VOG is a term used in Hawaiʻi to describe hazy conditions caused by gaseous emissions from Kīlauea Volcano. VOG is created when volcanic gases react with sunlight, oxygen, and moisture. The VOG plumes from Kīlauea contain a variety of compounds, at varying concentrations, that could have adverse impacts on the downwind communities and environment. During slack or southerly winds the entire island chain can be blanked in VOG. The VOG is most prevalent in the winter when Kona winds are most frequent.

Impacts and Mitigation Measures

The Proposed Action will not have an impact on volcanic hazards nor exacerbate the impacts associated with volcanic hazards. Any former volcanoes on Oʻahu are now considered inactive and the probability of eruption on Oʻahu is negligible. Therefore, only neighboring volcanoes on the Island of Hawaiʻi and possibly Haleakalā on Maui, which last erupted in the 1700’s, are expected to have any impact on Oʻahu. The main impact from volcanic hazards on Oʻahu would occur from VOG.

VOG impacts are highly dependent on both proximity of the source to the affected area as well as the day-to-day climatic conditions. During trade-wind weather, VOG is carried from the Kīlauea vents is carried toward the southwest, around the southern tip of the island where some is trapped within an eddy system on the Leeward side of the island. Hence, during normal trade-wind conditions the southern and Kona communities on Hawaiʻi Island are most heavily impacted by VOG. During slack or southerly winds, the entire island chain can be blanked in VOG. However, due to the short half-life of sulfur dioxide (SO_2) and sulfuric acid in the environment, Oʻahu is not expected to experience the elevated SO_2 levels that may be experienced on Hawaiʻi island (DEM, 2020). SO_2 levels are greatly reduced further away or upwind from the vents as the gas disperses and reacts with water to form sulfuric acid and then with ammonia to form ammonium sulfate which is eventually washed or settles out of the atmosphere. The visible “hazy”

appearance of VOG is often intensified when the gases and particulate matter combine with high humidity due to the warmer tropical temperatures when brought up from the south.

Informational resources on VOG distributions can be found at this website, which provides modeled VOG plume trajectories based on current and projected weather conditions:

http://mkwc.ifa.hawaii.edu/vmap/

Other informational resources on VOG and mitigation actions that the public can take to reduce the impacts of VOG can be found at these websites:

https://vog.ivhhn.org/

https://hilo.hawaii.edu/natural-hazards/vog

3.6 Natural Environment

3.6.1 Flora and Fauna

The UHM campus has been subject to intensive human development and utilization over the past century and is situated within the larger primary urban corridor of Honolulu. There are, however, many rare trees, including threatened and endangered species located around the UHM campus. This exceptional collection of tropical and subtropical trees on the UHM campus has long been regarded as a special asset to the UHM for both aesthetic and educational purposes. Many of the campus trees are either designated as a memorial tree or protected by the State of Hawai‘i as an exceptional tree. In 1975, the CCH enacted the Exceptional Tree Law to protect and honor trees in the community. In 2004, the State defined an exceptional tree as a tree, stand, or grove of trees with historic or cultural value because of its age, rarity, location, size, beauty, or endemic status.

In 2008, the Heritage Center of the UH School of Architecture published the *University of Hawai‘i at Mānoa Campus Heritage Report.* The report included a comprehensive list of plants on the UHM campus including their location at the time. The UHM campus contains a vast collection of botanic resources which contribute to the overall beauty of the UHM campus. In 2008, there were approximately 600 UHM-identified exceptional species of plants on the UHM campus. The identification and documentation of campus landscapes, spanning more than 50 years, provided the framework for the Heritage Landscape Inventory included in the University of Hawai‘i at Mānoa Campus Heritage Report (2008). Many of the trees have been labeled with the origin, common, and scientific names. This living collection includes 36 UHM-identified significant trees, seven (7) registered Exceptional CCH trees and 29 UHM Memorial Trees. There are also several other trees of note that contribute to the overall quality of the UHM campus (See Figure 3-13). The exceptional trees are protected by a County-wide ordinance. The seven Exceptional Trees are designated by the CCH Arborist Committee as worthy of preservation “by reason of age, rarity, location, size, aesthetic quality, endemic status or historical and cultural significance.” The majority of significant trees are situated on the Central Campus.

With regards to fauna, the urban character of the UHM campus provides poor habitat for wildlife. The predominant fauna at the UHM campus is introduced species, including rats, mice and feral cats. Typical avifauna includes the common mynah (*Acridotheres tristis*), doves and sparrows.

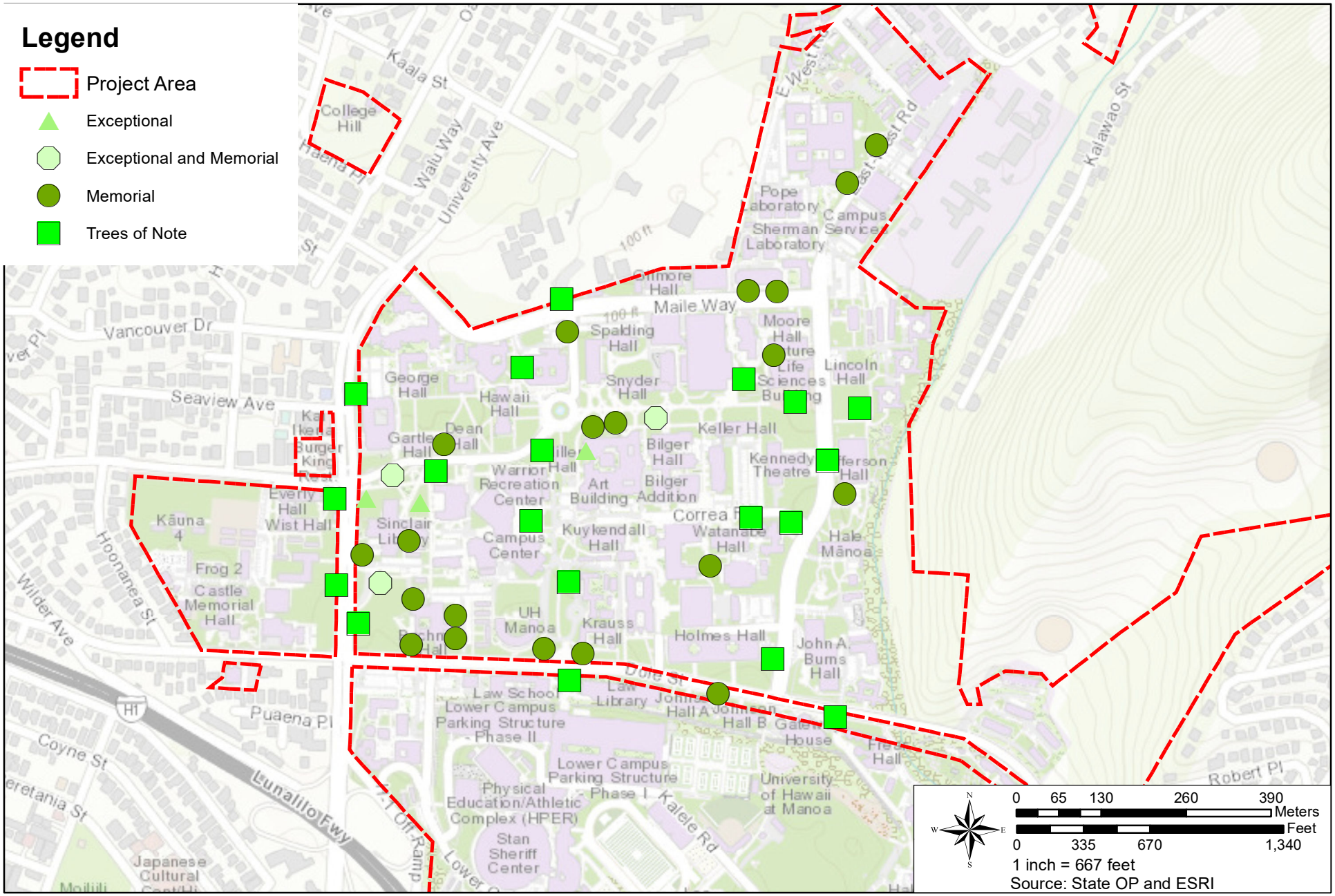


FIGURE 3-13

UHM SIGNIFICANT TREES MAP

It should be noted that SWCA Environmental Consultants conducted a flora and fauna survey in 2020 for the Mixed-Use Housing P3 Project EA which confirmed the conditions at the UHM campus. Observations made during the survey 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*) were observed at the site of the Mixed-Use Housing P3 Project, 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 habitats for all of the observed species protected under the MBTA, including the State-listed white tern, were found at the site of the Mixed-Use Housing P3 Project. White terns are generally known to nest around the UHM campus, but none were observed nesting during the 2020 SWCA Environmental Consultants flora and fauna 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 UHM campus. Suitable habitat for the Federal- and State- listed Hawaiian Stilt (*Himantopus mexicanus knudseni*) was identified at the Papa Lo‘i o Kānewai located on the Lower Campus. None of these listed species were observed during the survey period and are not anticipated to occur at the UHM campus, with the exception of the Hawaiian Hoary Bat.

Moreover, as recommended by the United States Fish and Wildlife Service (USFWS), the USFWS website, Information for Planning and Consultation (IPaC), was used to determine the Federal special status species most likely to occur at the UHM campus. The results coincided with the results of the flora and fauna survey conducted by SWCA Environmental Consultants. The USFWS IPaC website concluded that the following faunal species are likely to occur at the UHM campus: Hawaiian Hoary Bat (*Lasirus cinereus semotus*); Band-rumped Storm-petrel (*Oceanodroma castro*), Hawaii Akepa (*Loxops coccineus*); Hawaiian Duck (*Anas wyvilliana*); Hawaiian Common Gallinule (*Gallinula galeata sandvicensis*); Hawaiian Coot (*Fulica americana alai*); Hawaiian Stilt (*Himantopus mexicanus knudseni*); and the Newell’s Townsend’s Shearwater (*Puffinus auricularis newelli*). It should be noted however, that the UHM campus is not encompass or in the vicinity of a critical habitat.

Lower Campus

Based on the Heritage Landscape Inventory (2008), Lower Campus possesses three significant trees; two trees of note and one memorial tree. All of these trees are Monkey Pod (*Samanea saman*) trees contributes to the cohesive colonnade of trees near situated near the Law School and Johnson Hall and along University Avenue.

Central Campus

Based on the Heritage Landscape Inventory (2008), Central Campus possesses nearly 40 significant trees, including all of the Exceptional Trees. Details on the significant trees are included in Table 3-1 below.

Table 3-1: Central Campus Significant Trees		
Tree	**Location**	**Notes**
Banuyo (*Wallaceodendron celebicum*) (#411)	Between Sinclair Library and Campus Road	This tree is native to Indonesia and the Philippines. It is a relative of the Monkey Pod, producing similar flowers and foliage. The tree is also a memorial to Joseph Rock.
Baobab Tree (*Adansonia digitata*) (#66)	Located near the Art Building	This tree is one of the largest on campus. Native to Africa, it dominates the landscape with its enormous trunk. Many useful products can be created from this tree. From the fruit comes an exotic drink and from the roots, a red dye. The bark, can be made into rope and medicine
Cannonball Tree (*Couroupita guianensis*) (#82)	Makai side of Sinclair Library	Planted in 1933 by the playwright Thornton Wilder, the Cannonball tree is nearing extinction in the wild. Native to northeastern South America, the tree is named for the dozens of round, rust-colored grapefruit-like ‘cannonballs’ clustered around the trunk, which crash down to the ground when ripe, releasing a pungent unpleasant odor. When first in bloom, highly fragrant salmon-colored flowers emerge in clusters around the trunk of the tree. These bloom for only one day before transforming into the ‘cannonballs,’ which takes about 18 months to mature.

Table 3-1: Central Campus Significant Trees		
Tree	**Location**	**Notes**
Hutu (*Barringtonia asiatica*) (#84)	Located on McCarthy Mall near Bilger Hall	This tree has broad leaves, large woody fruits, and white flowers that resemble shaving brushes. In some areas of the Pacific, the seed is crushed, mixed with water and thrown into tidal pools or quiet streams to stun fish for easier catching
Indian Rubber Tree(*Ficus elastica*) (#591)	Located between Sinclair Library and Campus Road	The Indian Rubber tree is native to the areas between northeast India and south Indonesia. It is a memorial to David Starr Jordan.
Jack-in-the-box Tree (*Hernandia ovigera*) (#21)	Located between Sinclair Library and Campus Road	The waxy lantern-like fruits give this tree its name
Skunk Tree (*Sterculia foetida*) (#64)	Located on the ‘ewa-mauka corner of the Quadrangle	Native of the tropics, the wine-red, orange and yellow flowers of this tree emit a strong unpleasant odor. The tree was planted in 1928 in honor of the eminent horticulturist and botanist, Liberty Hyde Bailey, who was a world-renowned authority on palms. it has an unusual fruit with black seeds resembling olives.
Hong Kong Orchard (*Bauhina blakeana*) (#347)	Mauka side lawn of the Art building	Planted in 1990 , in memorial of Dianne Goldenberg
Autograph Tree (*Clusia rosea*) (# 58)	Diamond Head side of Bachman Hall	Planted on April 2, 1951 n memorial of Daniel L. Marsh.
Indian Rubber Tree (*Ficus elastica*) (#392)	Between Sinclair Library and Hemingway Hall	Planted on May 4, 1956 in memorial of J.E. Wallace Sterling
Chaulmoogra (*Hydnocarpus*) (#85)	Bachman Hall	Originally planted near Farrington Hall for King Prajadhipok of Siam in 1935, the tree was relocated to

Table 3-1: Central Campus Significant Trees		
Tree	**Location**	**Notes**
		Bachman Hall in 2000, and dedicated to Alice Ball, who did research on the tree-oil effectiveness to cure leperosy
Sun Sapote (*Licania platypus*) (#105)	Makai of Sinclair Library	Planted on March 25, 1957 in honor of the 50th Anniversary of UHM campus.
Phoenix Palms (grove) (*Phoenix roebelinii*) (#479)	Along Dole Street and Krauss Hall	Planted in 1985 in honor of the 40th Anniversary of the United Nations.
Plumeria (*Plumeria*) (#386)	Diamond Head side of the Queen Lili‘uokalani	Planted in 1933 in memorial of Mary Ku‘ulei Kuikainahaole
Ponga/Indian Beech (*Milletia pinnata*) (#464)	Makai of Bachman Hall	Planted on March 25, 1955 in memorial of Harry David Gideonse
Gold Tree (*Tabebuia donnell-smithii*) (#251)	1. Life Sciences Building 2. Bachman Hall 3. Three trees near HIG Building 4. Mauka of Hamilton Library	1. Planted in 1994 in memorial of David Quinn 2. Planted in 1959 in memorial of the Extension Directors F.G. Krauss, H.H. Warner, H.S. 3. Wadsworth, and Y.B. Goto. 4. Planted in 1978 in memorial of Gary Niemeyer, Bob Harvey, and Mike Allen 5. Planted in memorial of Joyce Watson
Pink Tecoma (*Tabebuia heterophylla*) (#329)	Gartley Hall	Planted in 1991 in memorial of Herbert B. Weaver.
Pink Trumpet Tree (*Tabebuia impetiginosa*) (#255)	Near Art Building	Planted in 1994 in memorial of Martin Luther King. Original tree was a Clitorea, which blew down in 1933.

Table 3-1: Central Campus Significant Trees		
Tree	**Location**	**Notes**
Teak (*Tectona grandis*) (#229)	Near Andrews Outdoor Theater	Planted in 1947 in memorial of Harlow Shapley
Baker's Shower Tree (C*assia bakeriana*) (#405)	Located at the entrance of Hamilton Library	This is an ornamental tree from Asia. Once in danger, this tree has been petitioned by a group of students and supported by the Chancellor for its preservation.
Bo Tree (*Ficus Religiosa*) (#35)	Queen Lili‘uokalani	Once designated as an exceptional tree, the Bo specimen on campus suffered from extensive pruning to accommodate the construction of the Student Services Building. It was removed from the list of exceptional trees. Although no longer an official exceptional tree, it remains on the Campus Heritage list as a reminder of the importance of proper maintenance procedures.
Chinese Banyan (Ficus macrocarpa) (grove, #33)	Near Andrews Outdoor Theatre, around Kennedy Theater, and throughout the East-West Center	This is one of the few fig trees in Hawai‘i that produce viable seeds. Specific pollinating wasps were imported by Harold Lyon into Hawai‘i to allow this fig to spread readily into deforested hillsides. This effort was so successful that now this tree is considered an invasive species in Hawaiian forests. When a seed sprouts in the crevice of another tree, the Chinese banyan grows aggressively, eventually strangling its host

Table 3-1: Central Campus Significant Trees		
Tree	**Location**	**Notes**
Banyan (*Ficus sp.*) (#544)	Near the Student Health Building	This Banyan suffered from a poor pruning and maintenance. The canopy spans nearly a 100 foot diameter. It is part of Joseph Rock’s original arboretum.
Banyan (*Ficus Rumphii*) (#435)	Located between Hemmengway Hall and Campus Road	This tree, an original Rock planting, is notable for its large buttressing trunks and willow-like canopy
Gold Tree (*Tabebuia donnell-smithii*) (#251)	Makai of Henke Hall on the Diamond Head side of McCarthy Mall	This tree aligns with the east-west axis of the planted Monkey pods of the Mall
Gold-fruit Benjamin Fig (*Ficus benjamina*) (#435)	Holmes Hall	Notable for its large, artistic-like branches
Rainbow Shower Trees (*Cassia x nealiae*) (#121)	Down the middle of East-West Road is the “Queen’s Hospital White.” Down the median of Maile Way is the “Whilhelmina Tenney.” The third, with yellow flowers, is the “Lunalilo Yellow.”	These trees burst into bloom to remind the campus that spring has arrived. The Rainbow Shower Tree is a hybrid produced in Hawai‘i between the Cassia javanica (#119) and the Cassia fistula (#120).
Sausage Tree (*Kigelia pinnata*) (#526)	Alongside Miller Hall	This tree can be identified by its sausage-like fruit. Native to Africa, the 'sausages' hang like pendulums from long stems. They may reach three feet in length, weigh up to 15 pounds, and can be made into a black dye. At night, reddish purple flowers bloom and emit an unpleasant odor. (Belknap 1982: 59). This is an original Rock planting that appeared on old University postcards.

Upper Central Campus

Based on the Heritage Landscape Inventory (2008), Upper Central Campus possesses four memorial trees. Table 3-2 below discusses each tree.

Table 3-2: Upper Central Campus Significant Trees

Tree	Location	Notes
Kukui/candle nut tree (*Aleurites moloccana*) (#157)	Diamond Head side	N/A
Giant Crape-Myrtle (*Lagerstroemia speciosa*) (#134)	Two at St. John Building	Planted in memorial of James Wildern
Lunalilo Yellow Shower Tree (*Cassia x nealiae*) (#353)	Makai of BioMed Building	Planted by the wife of the University President at the time. The date and person recognized are unknown

Mauka Campus

There are no identified significant trees within the Mauka Campus.

Impacts and Mitigation Measures

No significant impacts on flora and faunal resources are anticipated to result from the construction and operation of the Proposed Action. The UHM campus is situated within a high altered urban environment in the primary urban corridor of Honolulu.

Regarding fauna, in the short-term, construction activities may temporarily disrupt the behavior of common faunal species that are known to occur or frequent the UHM campus, but will not result in permanent displacement, or adversely affect the regional distribution. Based on the flora and fauna survey conducted by SWCA Environmental Consultants for the Mixed-Use Housing P3 Project, the White Tern may utilize the landscaped plants found at the UHM campus, namely the monkeypod trees. White Terns nest year-round, but with a marked peak between January and April, with March having the greatest nesting activity. A species pair lays and tends to one egg, not in a nest, but rather setting the egg in a tree limb crotch, depression, or other location where it will not be easily dislodged. The concentration of monkeypod trees may provide a suitable nesting habitat for this seabird. Any trees targeted for removal or trimming should be surveyed by a qualified biologist following the DLNR-DOFAW protocol.

There is the potential that several native and special status species may overfly or occur at the UHM campus during nesting seasons, such as the Hawaiian Coot (*Fulica americana alai*), and Hawaiian Common Gallinule (*Gallinula galeata sandvicensis*). It is against State law to harm or harass these species. If any Federal or State listed bird species are present during construction activities, then all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work may continue after the bird leaves the area of its own accord. If a State listed bird nest is discovered at any point, the UH should contact the O‘ahu DLNR-DOFAW Office at (808) 973-9778. It should be noted that nocturnally flying seabirds, especially fledglings on their way to sea in the summer and

fall, can become disoriented by exterior lighting that can result in collision with man-made artifacts or grounding of birds. Thus, these seabirds flying over the UHM campus could be temporarily impacted by construction lighting if used during nighttime construction. It is anticipated that the construction of the Proposed Action would primarily occur during typical daytime construction hours, approximately from 7 a.m. to 6 p.m., Monday through Friday, and 9 a.m. to 6 p.m., and sometimes Saturdays. Hence, overhead construction lighting would not be a concern or threat to seabirds potentially flying over the UHM campus at night. Therefore, construction of the Proposed Action would have minor adverse short-term impacts to these avian faunal species. However, any nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. It is recommended to protect seabirds that may overfly the UHM campus, that all overhead lights installed be fully shielded downward to prevent casting light beams directly into the sky to mitigate long-term impacts that may result due to operation of the Proposed Action.

Regarding mammalian species, it is anticipated that the Proposed Action will not result in any significant adverse impacts. As noted above, it is possible that the Hawaiian hoary bat may overfly the UHM campus on a seasonal basis. The principal potential impact of the Proposed Action to bats involves the removal of vegetation. Removal of trees within the UHM campus may temporarily displace individual bats using a tree as a roosting location. However, this species of bat uses multiple roosting locations within its home territory, so the disturbance associated with removal of vegetation would be minimal. An exception might be during pupping season because females carrying pups may be less able to rapidly vacate a roost as a tree is removed. Further, adult female bats sometimes leave their pups in the roost tree when they forage. Very small pups may be unable to flee a tree that is being felled. To mitigate potential impacts to roosting bats it is recommended that no woody vegetation taller than 4.6 m (15 ft.), be removed between June 1 and September 15, the period in which roosting bats are potentially at risk from vegetation clearing, and without first consulting with the DLNR-DOFAW. Moreover, barbed wire should be avoided for any construction because bat mortalities have been documented as a result of becoming ensnared by barbed wire during flight. Based on these measures, it is anticipated that the Proposed Action will not create significant adverse impacts. There is the presence of nonnative predators such as feral cats, rodents and mongoose. There is the potential for these predators, which are characterized as scavengers, to be drawn to the UHM campus. These nonnative predators also have the ability to harm vulnerable bird species. To mitigate the potential impacts associated with these predators it is recommended that the following best management practices be followed which include but are not limited to removal of feral cats; implementation of bait stations for rodents and mongoose and provide covered trash receptacles throughout the UHM campus.

Regarding flora, it is anticipated that the Proposed Action will not result in any adverse impacts. The Exceptional Trees at the UHM campus are protected by the Hawai‘i State Legislature Act 105, which designates an Exceptional Tree as “a tree or stand or grove of trees with historic or cultural value, by which reason of its age, rarity, location, size, aesthetic quality, or endemic status has been designated by the county committee as worthy of preservation.” Through this act, the Hawai‘i State Legislature recognizes that “beyond their aesthetic worth and cultural significance, trees perform an important role in maintaining ecological balance, in increasing soil conservation and natural oxygen production, as windbreaks for necessary plant species, and in retarding flooding, erosion,

siltation, lateral distribution of air pollution, and noise." Moreover, where the New Construction/Replacement of Existing Structures (Net Increase) Projects are sited to occur, there are no Exceptional Trees in the immediate vicinity. Hence, the Exceptional Trees situated on the UHM campus will remain and will not be impacted by the Proposed Action. With regards to the UHM significant trees and trees of note, it is also anticipated that these trees will not be impacted at this time. In fact, as a part of this Proposed Action, a Landscape Master Plan is being developed for the subsequent PRU Permit. The UHM's landscape is one of its distinctive attributes and the UHM's goal is to celebrate its unique natural assets. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources. Thus, it is anticipated that any significant plants or landscapes that may need to be removed or altered to implement the Proposed Action would be returned to existing conditions to the extent feasible or enhanced. Additionally, soil disturbing construction related activities may unearth soil and plant material that potentially contains invasive fungal pathogens vertebrate and invertebrate pests (e.g. Little Fire Ants, Coconut Rhinoceros beetles), or invasive plant parts that could harm Hawai‘i's native species and ecosystems. In general, to reduce potential impacts, the following mitigation measures are recommended:

- Regularly clear equipment, materials and personnel of excess soils and debris;
- Consult the O‘ahu Invasive Species Committee at (808) 266-7994 in planning, design, construction and operation of the project to learn of any high-risk invasive species in the area and ways to mitigate spread.
- 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.

3.7 Historic and Archaeological Resources

A Cultural Resources Report (Archaeological Literature Review and Cultural Assessment) (ARCA) was prepared for the Proposed Action assessing its potential impact on historic and cultural resources and, at a minimum, describe: 1) any valued cultural, historic, or natural resources at the UHM campus in question, including the extent to which traditional and customary Native Hawaiian rights are exercised in the area; 2) the extent to which those resources – including traditional and customary native Hawaiians rights – will be affected or impaired by the Proposed Action; and, 3) the feasible action, if any, to be taken to reasonably protect Native Hawaiian rights if they are found to exist (See Appendix F). The ARCA gathered historic cultural information from stories and other oral histories about the affected area to provide a cultural foundation; inventory as much information as can be identified about as many known cultural,

historic, and natural resources, including previous archeological inventory surveys, cultural impact assessments, etc. that may have been completed for the UHM campus; and, update the information with interviews or lineal descendants or other knowledgeable cultural practitioners. The ARCA also identifies impacts to the identified resources and develops reasonable mitigation measures to reduce the potential impacts. Section 3.7 will focus historic and archeological resources, while Section 3.8 will focus on cultural resources and practices.

Methodology

Background research for the ARCA was conducted using materials obtained from the State Historic Preservation Division (SHPD) library in Kapolei and the Honua Consulting LLC. report library. On-line materials consulted included the Ulukau Electronic Hawaiian Database (www.ulukau.com), Papakilo Database (www.papakilodatabase.com), the State Library on-line (http://www.librarieshawaii.org/ Serials/databases.html), and Waihona ‘Āina Māhele database (http://www.waihona.com). Hawaiian terms and place names were translated using the on-line Hawaiian dictionaries (Nā Puke Wehewehe ‘Ōlelo Hawai‘i) (www.wehewehe.com), *Place Names of Hawai‘i* (Pukui et al. 1974), and *Hawai‘i Place Names* (Clark 2002). Historic maps were obtained from the State Archives, State of Hawai‘i Land Survey Division website (http://ags.hawaii.gov/survey/map-search/), UHM maps, aerial photographs, and GIS (MAGIS) website (http://guides.library.manoa.hawaii.edu/magis). Maps were geo-referenced for this report using ArcGIS 10.3. GIS is not 100% precise and historic maps were created with inherent flaws; therefore, geo-referenced maps should be understood to have some built-in inaccuracy.

The ARCA’s primary resources included, but were not limited to: land use records, including the Hawaiian Land Commission Awards (LCA) records from the Māhele ‘Āina (Land Division) of 1848; the Boundary Commission Testimonies and Survey records of the Kingdom and Territory of Hawai‘i; and historical texts authored or compiled by: David Malo (1987); Samuel M. Kamakau (1964, 1991, 1992); records of the American Board of Commissioners of Foreign Missions (1820–1860); Charles Wilkes (1845); Alexander & Preston (1892–1894); Abraham Fornander (1916–1919); and many other native and foreign writers. The ARCA also includes several native accounts from Hawaiian language newspapers (primarily compiled and translated from Hawaiian to English by K. Maly), and historical records authored by nineteenth century visitors, and residents of the region.

Historical and archival resources were located in the collections of the Hawai‘i State Archives, Survey Division, Land Management Division, Survey Division, and Bureau of Conveyances; the Bishop Museum Library and Archives; the Hawaiian Historical Society and the Hawaiian Mission Children‘s Society Library; UH Hilo Mo‘okini Library; the National Archives and Records Administration (NARA), Maryland; the Library of Congress, Washington D.C.; the NOAA National Library, Maryland; the Smithsonian Institution Natural History and National Anthropological Archives libraries, Washington, D.C.; the Houghton Library at Harvard; the United States Geological Survey (USGS) Library, Denver; the Paniolo Preservation Society and Parker Ranch collections; private family collections; and in the collection of Kumu Pono Associates LLC.

Traditional Background of Mānoa

The UHM campus is located in the ‘ili of Mānoa within the ahupua‘a of Waikīkī. Traditionally, Waikīkī was a dense population center with extensive agricultural fields and a fertile fringing reef. Waikīkī is translated to “spouting water”, said to be named for the swampland that once covered the lowlands (Pukui et al. 1974). Multiple streams flowed from the valleys of Makiki, Mānoa, and Pālolo which provided fresh water to feed irrigated taro fields (lo‘i), bananas, and sugarcane in

the lowlands and makai (seaward) areas. The coastal areas were drier than inland zones and therefore the irrigation systems provided the means for wetland agricultural complexes. The coast of Waikīkī had coconut groves, fishponds, abundant marine resources, and excellent surfing. Inhabitants of Waikīkī lived near the coast, on the fringes of lowland fields, and in the inland valleys. Waikīkī was a favored residence for Hawaiian ali‘i (royalty) (Beckwith 1970, Fornander 1998).

Behind Waikīkī, the Ko‘olau Mountain Range caught the warm moist air driven by the trade winds. Mānoa, translated as “vast”, runs from a projecting spur of the mountain range at the head of the valley called ‘Aka‘aka to the ocean (Nakuina 1907, Pukui et al. 1974). Two additional mountain peaks along the Ko‘olau were named for twin children, a boy named Kahaukani representing Mānoa wind, and a girl named Kauahuahine (or Kauakuahine) signifying the Mānoa rain (Kalākaua 1887, Thrum 1891). It is said that Mānoa Valley was divided for chiefs and commoners. 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 (Pukui 1943 quoted in Sterling and Summers 1978).

The environment of Mānoa was ideal for taro (*Colocasia esculenta)* lo‘i and it was known to contain a vast spread of taro land (Handy and Handy 1972, Pukui et al. 1974). Mānoa Valley had much well-watered level land which was better adapted to terracing than that of Nu‘uanu. In the upper valley all the bottom land was terraced. In 1931 much of this land was abandoned, covered with grass; now it is mostly in residences. In 1931, however, 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 (Handy and Handy 1972).

The largest watercourse of the valley, Mānoa Stream, flows through the UHM campus and also feeds the lo‘i at Kamakakūokalani Center for Hawaiian Studies.

The presence of freshwater springs or pūnāwai throughout Mānoa is associated with the exploits of Kāne and Kanaloa. The gods are said to have lived on Kōnāhuanui (“large fat innards”), the highest peak of the Ko‘olau (Pukui et al. 1974). They are said to have created multiple freshwater springs including those at Kānewai (currently the Kānewai Cultural Garden), Wailele (located under property of Mid-Pacific Institute), and Punahou or Kapunahou; as well as several other springs such as Hualani, Ka‘aipū (“the eating together”), Wa‘aloa (“long canoe”), and Waiakeakua (“water of the gods”) (Pukui et al. 1974). Of these springs, the closest to the UHM campus is Wailele.

Wailele (“waterfall”) was named for the pūnāwai found on the grounds of Mid-Pacific Institute (Pukui et al. 1974). Those waters are believed to originate from the heights of Pu‘u Kākea under the stewardship of the mo‘o, or water lizard, named Kākea. When petitioned by the children Kauawa‘ahila and Kauaki‘owao, who were hiding from their mean stepmother, Kākea diverted the waters of Wailele Spring so that half flowed to Kanawai (likely Kānewai) and half flowed to Ka-punahou for the benefit of the children (Thrum 1907).

Punahou or Kapunahou (“new spring”) was described as the following:

> There was a famous terrace area below Punahou School, which was watered by the spring from with the school takes its name. Nakuina gives the following note

> about this area: …Kauawaahila afterwards made some kalo patches, and people attracted by the water and consequent fertility of the place came and settled about…More and more kalo patches were excavated and the place became a thriving settlement. The spring became known as Ka Punahou [The New Spring], and gave its name to the surrounding place. (Handy 1940 quoted in Sterling and Summers 1978)

There are several other mo'olelo (story or history) associated with Kāne and Kanaloa throughout Mānoa, as well as other myths and mo'olelo regarding people, places, and events that took place within Mānoa. This includes the myth of the Princess of Mānoa and the story of Kahalaopuna; Kauiomānoa, a large rock in Mānoa Valley; and, 'Ualaka'a, the rolling sweet potato.

History of Mānoa

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.

After the Māhele, urbanization in the late 19th and early 20th 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. As discussed throughout, located on the Lower Campus, 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.

Previous Archeology

Due to 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. Table 3-3 below (depicted as Figure 12 in Appendix F) summarizes the previous archeological studies conducted at the UHM campus or in the vicinity of the UHM campus and their findings.

Table 3-3: Listing of Previous Archeological Studies in the Vicinity of the UHM Campus

Author(s)	Type of Study	Location	Findings (SIHP #50-80-14)
Thrum 1906a	List of Heiau	Mānoa	4 heiau listed, Kawapōpō, Hakika, Hipawai, and Kūkaʻōʻō
Nakuina 1907b	Heiau descriptions	Mānoa	Describes two heiau, Kaualaʻa and Kauwalomaile near Mid-Pacific Institute
McAllister 1933	Island-Wide Survey	Oʻahu	Identified 3 sites in the vicinity of the project area: Site 63 (Hipawai Heiau), Site 64 (Kūkaʻōʻō Heiau), Site 65 (Mānoa Valley)
Ching 1968	Archaeological Investigation	UHM, North bank of Mānoa Stream, 2-8	Possible house site, burial or heiau identified, no site number assigned
Luscomb 1975	Archaeological Investigation	2626 Avenue Street, TMK: [1] 2-9-020:022	Site determined to be the likely location of Kawapōpō Heiau, no site number assigned
Barrera 1985	Preliminary Archaeological Study	Mānoa Hillside Subdivision, TMK: [1] 2-9-024	No sites recorded
Rosendahl 1987	Archaeological Reconnaissance Survey	Waʻahila Reservoirs Project Area, TMK: 2-5-56: por. 1, por. 2	No sites recorded
Kawachi 1988	Archaeological Field Check	St. Francis High School, TMK: [1] 2-9-004:001	Inspected a boulder and retaining wall, no site numbers assigned
Pietrusewsky 1989	Report on Faunal Remains	2462 East Mānoa Road, TMK: [1] 2-9-010:040	Identified cremated remains of two cats and one dog, likely over 50 years of age; no site number assigned
Douglas 1990	Report on Human Skeletal Remains	UHM, Keller Hall, TMK: [1] 2-8-023:003	Documentation of incomplete human skeletal remains found near Keller Hall (SIHP # -4191)
Hammatt and Shideler 1991	Investigation of Human Remains	Dole St. Near Kānewai Park	Identified human remains of 18 individuals (SIHP # -4266)

Author(s)	Type of Study	Location	Findings (SIHP #50-80-14)
Kennedy 1991, Cleghorn and Anderson 1992, Tomonari-Tuggle 1998a	Archaeological Investigation, Inventory Survey & Preservation, and Historic Background Pertaining to Kāka‘ō‘ō Heiau	Charles Cooke, Jr. residence	Kāka‘ō‘ō Heiau (SIHP # -064) and the Charles Montague Cooke, Jr. residence (SIHP # -1368, NR #85003402)
Burtchard 1992a and 1992b, Burtchard 1994, Liston and Burthcard 1996	Archaeological Data Recovery (Phase I), (Phase II), (Final)	Ka Papa Lo‘i ‘o Kānewai, UHM, TMK: [1] 2-8-029:001	Ka Papa Lo‘i ‘o Kānewai (SIHP # -4498)
Jones et al. 1994	Archaeological Monitoring Report (AMR)	School of Architecture Building, UHM, TMK: [1] 2-9	No sites recorded
Wolforth and Haun 1996	Archaeological Inventory Survey (AIS)	Transmission Line, Upper and Lower Mānoa valley, TMK: [1] 2-7, 2-8, 2-9, 3-2, 3-3, and 3-4	Remnants of a former community park, Site 1726.1 (No SIHP number assigned); SIHP # -5463 (terraces and walls); SIHP # -4266 (a former cemetery); and an ‘auwai associated with SIHP # -4498 (Ka Papa Lo‘i ‘o Kānewai)
Tomonari-Tuggle 1998b	Historical Research and Archaeological Assessment	Southwest Fisheries Science Center, Honolulu Laboratory, TMK: [1] 2-8-023:009	No site recorded
McIntosh and Cleghorn 2007	Archaeological Monitoring Report (AMR)	Old Quandrangle Chilled Water Loop, UH- Mānoa, TMK: [1] 2-8-023:003	No sites recorded

Author(s)	Type of Study	Location	Findings (SIHP #50-80-14)
O’Hare et al. 2007	Archaeological Literature Review and Field Inspection (LRFI)	Kamehameha Schools University Parcels, and Varsity Theater, TMKs: (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	Agricultural areas identified, no sites recorded
Dey and Hammatt 2008	AMR	Punahou Water Systems, TMK: [1] 2-8-014, -015, -016, -017, -020, -021, and -022:various	No sites recorded
Groza et al. 2008	LRFI	Mānoa Public Library, TMK: [1] 2-9-023:025	No sites recorded
Groza et al. 2009	AMR	Mānoa Public Library TMK: [1] 2-9-023:025	No sites recorded
Shideler and Hammatt 2008 / Monahan and Ka‘uhane 2008	LRFI, Cultural Impact Assessment (CIA)	UHM Long Range Development Plan, TMK: [1] 2-8, 2-9, 3-3, and various other parcels	Identified Koana Cave (No SIHP #), SIHP # -063 (Hipawai Heiau), SIHP # -1352 (UH-Mānoa campus), and SIHP # -4498 (Ka Papa Lo‘i ‘o Kānewai)

Author(s)	Type of Study	Location	Findings (SIHP #50-80-14)
Loynaz and Hammatt 2009	Burial Site Component of an Archaeological Data Recovery Plan	2826 Mānoa Road, TMK: [1] 2-9-016:052	One native Hawaiian burial documented (SIHP # -7056)
Hunkin and Hammatt 2009	AMR	UHM, Bachman Hall, TMK: [1] 2-8-023:003	No sites recorded
Hammatt and Shideler 2010	LRFI	UH Quarry	No sites recorded
O’Hare et al. 2010a and b	Cultural Resources and Ethnographic Studies (Volume I and Volume II)	Ala Wai watershed project, Makiki, Mānoa, and Pālolo Ahupua‘a, TMK: [1] 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, and 2-9; [1] 3-1, 3-2, 3-3, and 3-4	Kanewai lo‘i (SIHP # -4498) noted, and possible agricultural terrace (SIHP # -6729)
Hammatt and Shideler 2013	Archaeological Literature and Cultural History Review and Field Inspection	UHM, Football practice field video platforms, Soccer practice field bleachers, TMK: [1] 2-8-029:001	No sites recorded
Mintmier et al. 2014	AMR	Intersection of University Avenue and Metcalf Street, TMK: [1] 2-8-015:001, 2-8-016:001, and 2-8-023:003	No sites recorded
McElroy and Duhaylonsod 2016	AIS, Archaeological Assessment (AA Report)	UHM, William S. Richardson School of Law, TMK: [1] 2-8-029:001 por.	No sites recorded

Author(s)	Type of Study	Location	Findings (SIHP #50-80-14)
Raff-Tierney et al. 2017	AIS	First Hawaiian Bank, East Mānoa Road, TMK: [1] 2-9-013:036 and 2-9-022:025	Recorded SIHP # -7957, two human burial pits (with four individuals), a charcoal and ash enriched pit feature, and a possible pig burial
Thurman and Thetford 2019	End of Fieldwork Report	Kamānele Park, TMK: [1] 2-9-003:006	Heiau and site complex (SIHP # -8768)

The previously identified archeological and historic sites, as well as their type, within the UHM campus and in the vicinity are represented in Figure 3-14.

Impacts and Mitigation Measures

It is acknowledged that the results of the ARCA indicate that there are archeological historic properties that exist on the UHM campus and there is the potential for more to be identified. While the UHM campus has been altered to a large extent over the past century through agricultural practices, quarry activities, and the development of the existing UHM campus, it remains possible that subsurface archeological resources may exist at the UHM campus. Thus, there is a potential for temporary and permanent impacts to occur to as-yet unidentified archeological and historic properties that could result from construction activities including, but not limited to, open trenching, microtunneling and horizontal drilling, and demolition and construction of structures. Open trenching has the potential to result in the greatest impact to archeological and historic resources as it involves linear areas of disturbance in the layers of soil and subsoil that typically hold cultural materials associated with subsurface archeological sites. Tunneling, microtunneling, and horizontal drilling all involve less disturbance of the soils closer to the surface that may contain cultural materials; these would primarily result in impacts from the construction of shafts, which represent a smaller footprint of ground disturbance than open trenching. 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 prior to any ground disturbing construction activities in consultation with SHPD;
- Construction monitoring may also be necessary, depending upon the findings of the AIS; and,
- In addition, construction contractors would be required to adhere to standard best management practices regarding the protection of archeological resources, including identification, stop work, and notification measures. Should archeological resources be discovered, all appropriate measures would be adhered to for their protection; and as a result, long-term impacts to archeological resources would be expected to be minor as irreversible ground disturbance has the potential to impact archeological sites permanently.

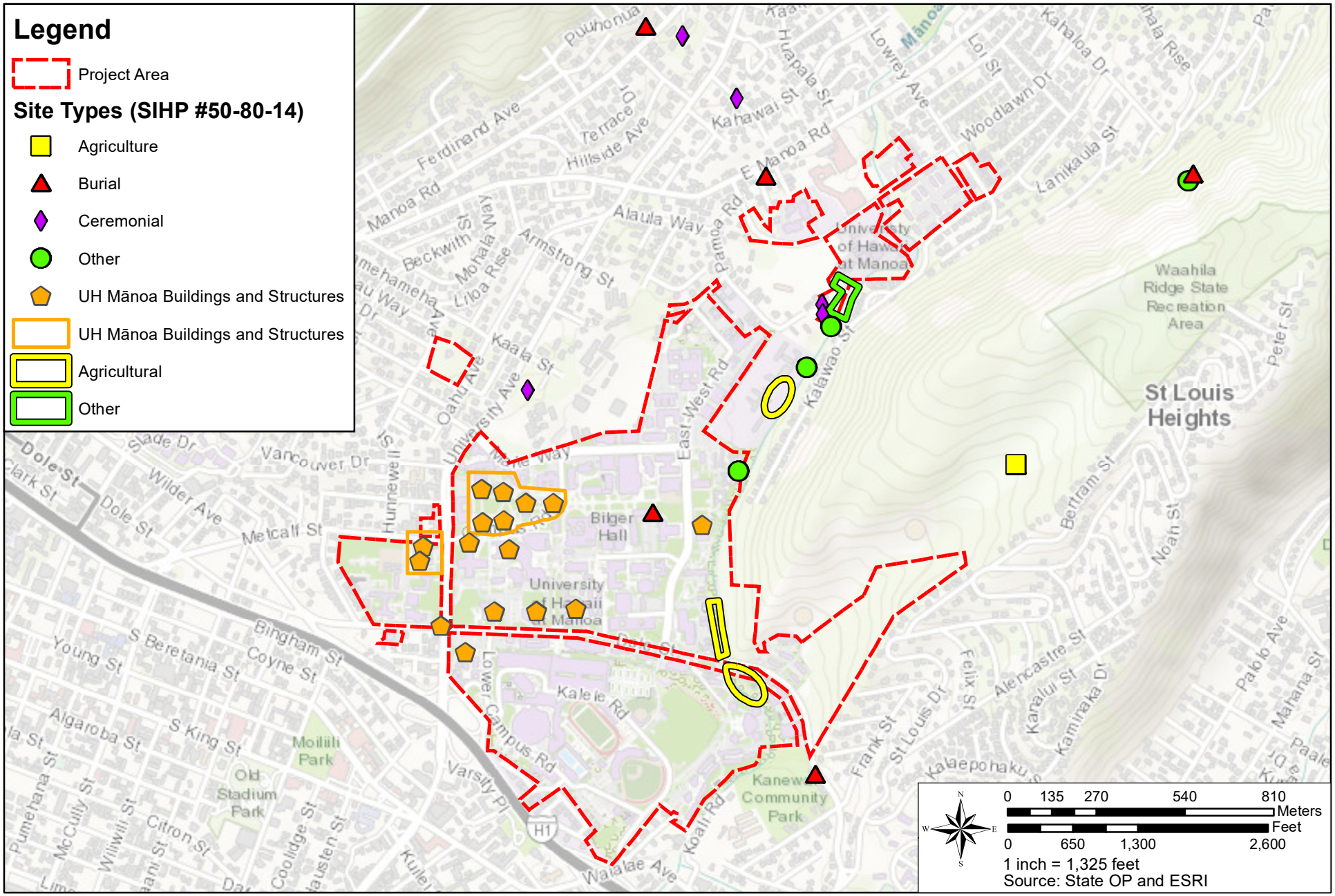


FIGURE 3-14

PREVIOUSLY IDENTIFIED ARCHEOLOGICAL SITES AT THE UHM CAMPUS AND ADJACENT LANDS MAP

With regards to any renovation work being conducted as part of the Proposed Action that could potentially impact buildings considered historic (e.g., Sinclair Library), a historic review is recommended to be conducted prior to any alteration of identified buildings.

3.8 Cultural Resources and Practices

As noted in Section 3.7, an ARCA was prepared for the Proposed Action assessing its potential impact on historic and cultural resources and practices.[1] Cultural resources are defined for the purposes of this EA as those associated with cultural practices and traditions. Cultural practices are activities imbued with cultural or spiritual meaning; they can be traditional or modern. They may include traditional Hawaiian practices, but also the cultural practices of other communities and ethnic groups.

Articles IX and XII of the State Constitution, other State laws, and the courts of the State require government agencies to protect and preserve cultural beliefs, practices, and resources of Kānaka ‘Ōiwi (Native Hawaiians) and other ethnic groups. To assist decision makers in the protection of cultural resources, Chapter 343, HRS and HAR Section 11-200.1 rules for the environmental impact assessment process require project proponents to assess proposed actions for their potential impacts to cultural properties, practices, and beliefs.

This process was clarified by the Act 50, Session Laws of Hawai‘i (SLH) 2000. Act 50 recognized the importance of protecting Native Hawaiian cultural resources and required that EAs include the disclosure of the effects of a proposed action on the cultural practices of the community and State, and the Native Hawaiian community in particular. Specifically, the Environmental Council suggested that cultural impact assessments (CIA) should include information relating to practices and beliefs of a particular cultural or ethnic group or groups. Such information may be obtained through public scoping, community meetings, ethnographic interviews, and oral histories.

It is important to note that while similar in their areas of studies, archaeological surveys and CIAs are concerned with distinct and different foci. Archaeological studies are primarily concerned with historic properties and tangible heritage, whereas CIAs look at cultural practices and beliefs, which can be associated with a specific location, but also often intangible in nature.

The present analyses of archival documents, oral traditions (oli (chants), mele (songs), and/or hula (dance)), and Hawaiian language sources including books, manuscripts, and newspaper articles, are focused on identifying recorded cultural and archaeological resources present on the landscape, including: Hawaiian and non-Hawaiian place names; landscape features (ridges, gulches, cinder cones); archaeological features (kuleana parcel walls, house platforms, shrines, heiau (places of worship), etc.); culturally significant areas (viewsheds, unmodified area’s where gathering practices and/or rituals were performed); and significant biocultural resources. The information gathered through research helped to focus interview questions on specific features and elements within and in the vicinity of the UHM campus. Interviews with lineal and cultural descendants are instrumental in procuring information about the UHM campus’ transformation through time and changing uses. Interviews were conducted with recognized cultural experts and summaries of those interviews are summarized below.

[1] Information and discussions presented in Section 3.7 was not repeated in this section and discussion to avoid repetition.

Place Names

Historical documents that contain traditional knowledge embedded in place names which reveals the history of place, people, and the depth of their traditions. Although fragmented, the surviving place names describe a rich culture. On these lands are found many place names that have survived the passing of time. The occurrence of place names demonstrates the broad relationship of the natural landscape to the culture and practices of the Hawaiian people. In ancient times, named localities served a variety of functions, telling people about: (1) places where the gods walked the earth and changed the lives of people for good or worse; (2) heiau or other features of ceremonial importance; (3) triangulation points such as ko‘a (ceremonial markers) for fishing grounds and fishing sites; (4) residences and burial sites; (5) areas of planting; (6) water sources; (7) trails and trail side resting places (o‘io‘ina), such as a rock shelter or tree shaded spot; (8) the sources of particular natural resources/resource collections areas, or any number of other features; or (9) notable events which occurred at a given area. Through place names knowledge of the past and places of significance was handed down across countless generations. There is an extensive collection of native place names recorded in the mo‘olelo (traditions and historical accounts) published in Hawaiian newspapers.

Several Hawaiian place names are known for features of the Mānoa region and environment. Table 3-4 below lists place names in the vicinity of the UHM campus, a description of the locations, and their English translations. Early historic maps of Mānoa include many of these place names.

Table 3-4: Listing of Place Names in the Vicinity of the UHM Campus

Place Name	Description	Meaning
‘Aka‘aka	Projecting spur of mountain range at the head of Mānoa valley	Laughter
Awāwaloa (Mount Olympus)	Old name for Mount Olympus peak on Ko‘olau mountain range, separates Honolulu from Ko‘olaupoko	
Hipawai	Street and area in lower Mānoa; a heiau near here where human sacrifices were offered had this name	Water foolishness
Ka‘ahaloa	‘ili ‘āina (land division whose chief pays tribute to chief of the ahupua‘a, rather than to the king)	
Kamookahi		
Kāneloa	Road and land area in Waikīkī	Tall Kāne
Kānewai	Current Kānewai Cultural Garden	Water of Kāne
Kauiomānoa	A large rock in the middle of Mānoa Valley, the dwelling place of Kauiomānoa	
Kauwala‘a or Kauala‘a	‘ili kū (independent ‘ili of the ahupua‘a, pays tribute directly to the ruling chief)	

Place Name	Description	Meaning
Kolowalu	Ridges on the east side of upper Mānoa; a trail along the ridge begins near the summit of St. Louis Heights and descends into Woodlawn, Mānoa, another branch leads to Mt. Olympus	Eight creeping
Kōnāhuanui	Highest peaks of the Ko‘olau Mountain Range, separates Honolulu from Ko‘olaupoko	Large fat innards
Makiki	A street, land section, stream, and valley, likely named after a type of stone weight used for octopus lures	
Mānoa	A land section, stream, waterfall, valley, field, and elementary school, location of the project area	Vast
Paliluahine	East side of Mānoa, Hakika Heiau is said to reside there	
Pālolo	A land section, homesteads, stream, valley, avenue, elementary school and field	Clay
Pāmoa	Site of St. Francis Convent, Mānoa; name of a street passing the convent	Chicken enclosure
Pilipili	‘ili‘āina (land division)	
Puahia	‘ili kū	Spry, quick; hazy or gray
Punahou or Kapunahou	A street and private school established by Hiram Bingham in 1841 on property given by Queen Ka‘ahumanu for the education of the children of missionaries and chiefs	New spring
Pu‘u Kākea (Sugar Loaf)	Cinder cone on the Ko‘olau Mountain Range on west side of Mānoa Valley, named for a storm wind of Mānoa	
Pu‘u Lepalepa	Peak at the crest of the Ko‘olau Mountain Range between Mānoa and Pālolo valleys	
Pu‘u o Mānoa (Rocky Hill)	Old name for Rocky Hill, Punahou	Hill of Mānoa
Pu‘u Ōhi‘a (Tantalus)	Mount Tantalus, behind Honolulu	Ōhi‘a tree hill
‘Ualaka‘a (Round Top)	The old name for Round Top, also a street, state park, believed that	Rolling sweet potato

Place Name	Description	Meaning
	Kamehameha I planted sweet potatoes there	
Waikīkī	A land division, chiefess, beach, park, elementary school, tennis center, named after the swamps drained after construction of the Alā Wai canal, ahupua‘a in which the UHM campus is located	Spouting water
Wa‘ahila	Former land section, faculty housing at the UHM campus, and ridge separating Mānoa and Pālolo valleys	
Wailele or Kawailele	Under the property of the Mid-Pacific Institute	Waterfall

The place names provide details regarding the physical environment and the abundance of resources in the region.

Cultural-Historical Narratives

ARCA compiled cultural-historical narratives which reveal legacy of place-based knowledge and stewardship, that provide access to authentic, accurate and culturally rich information that can be used to enrich the Proposed Action as it progresses in a manner that honors the extraordinary history of this land and its people. As noted in Section 3.7, these narratives several moʻolelo associated with Kāne and Kanaloa throughout Mānoa, as well as other myths and moʻolelo regarding people, places, and events that took place within Mānoa. This includes the myth of the Princess of Mānoa and the story of Kahalaopuna; Kauiomānoa, a large rock in Mānoa Valley; and, ʻUalakaʻa, the rolling sweet potato. These narratives focus on a collection of many notable traditions and histories as well as the diverse history of the land and people of Mānoa, including the period of early Hawaiian residency to the modern day. The nature of Hawaiian history makes it necessary that accounts from neighboring ahupua‘a, larger regions, and even cross-island be cited as well. However, while many place names and primary source historical accounts (from both Hawaiian and English language narratives) are cited within the ARCA, it is impossible to tell the whole story of these lands. A wide range of history, spanning the generations, has been covered. It should be noted that the resources provided within ARCA are a means of connecting people with the history of their communities—that they are part of that history. Knowledge of place will in turn promote appreciation for place and encourage acts of stewardship for the valued resources that are passed on to the future.

Tangible and Intangible Cultural Resources

It is important to note that ARCA’s unique methodology divides cultural resources into two categories: biocultural resources and built environment resources. The ARCA defines biocultural resources as elements that exist naturally in Hawai‘i without human contact. These resources and their significance can be shown, proven, and observed through oral histories and literature. The ARCA defines the built environment resources as elements that exist through human interaction with biocultural resources whose existence and history can be defined, examined, and proven through anthropological and archaeological observation. Utilizing this methodology is critical in

the preparation of cultural studies as many resources, such as those related to akua (Hawaiian gods), do not necessarily result in material evidence, but nonetheless are significant to members of the Native Hawaiian community.

Hawaiian culture views natural and cultural resources as being one and the same: without the resources provided by nature, cultural resources could and would not be procured. From a Hawaiian perspective, all natural and cultural resources are interrelated, and all natural and cultural resources are culturally significant. Kepā Maly, ethnographer and Hawaiian language scholar, points out, “In any culturally sensitive discussion on land use in Hawaii, one must understand that Hawaiian culture evolved in close partnership with its natural environment. Thus, Hawaiian culture does not have a clear dividing line of where culture ends and nature begins” (Maly, 2001).

The *Buke Mele Lahui* (Hawaiian National Songbook), published in 1895, is “the largest number of political and patriotic Hawaiian songs ever printed in one place,” featuring mele that “echo the steadfast resilience of Hawaiians of that time as they weathered the political turbulence of the 1880s and 1890s that completely altered their world” through the overthrow and establishment of a foreign-led provisional government and subsequent annexation to the U.S. (Nogelmeier and Stillman 2003). There are numerous mele and ‘oli composed for and inspired by the region that the UHM campus is situated in.

The ability to travel was essential to Hawaiians and enabled their sustainability. Travel, and the freedom to move throughout different areas, had different names, including huaka‘i, ka‘apuni, or ka‘ahele. Traveling by sea had distinct names as well, like ‘aumoana. Traveling through the mountains was sometimes referred to as hele mauna. Travel, and moving throughout various places and regions was an essential practice and way of life in traditional Hawai‘i. As traveling through traditional trails was the primary means by which people traveled on land throughout most of Hawaiian history, the traditional trail system is particularly important throughout the Hawaiian Islands. Throughout the islands, there were numerous trails that allowed for people to access different locations. This trail system was critical not only for maintaining a healthy population and managing this population, but it was also important for the traditional economic system of bartering. The trail system allowed for different localized communities to engage and interact. This also allowed for the trade of goods throughout island communities.

Traditionally, trails were widely used, as there was no other means of land transportation. This meant that these trails were essential to the ability of different ahupua‘a communities to interact. There were also important to allow for the governance of different ahupua‘a by konohiki and ali‘i. Mānoa historically had trails that ran throughout the area, and trails continue to be a valuable part of the Mānoa landscape. The State of Hawaii‘s Nā Ala Hele Program manages numerous trails in the area. The area enjoys a high density of trails. There are multiple trails in the area, some of which are:

- Wa‘ahila Ridge Trail
- Pu‘u Pia Trail
- Kolowalu Trail
- Mānoa Falls Trail
- Mānoa Cliff Trail
- Moleka Trail
- ‘Ualaka‘a Trail

- Maunalaha Trail

Since poi was the staple food for Native Hawaiians, it was of the utmost priority for the first settlers to establish lo‘i. Kalo’s prominence in the Hawaiian diet derived from its nutritional value, but even more so from its mythological significance. According to Hawaiian traditions, the first human (male) was born from the taro plant:

> The first born son of Wakea and Papa was of premature birth and was given the name Haloa-naka. The little thing died, however, and its body was buried in the ground at one end of the house. After a while, a taro plant shot up from the child’s body, the leaf of which was named lau-kapa-lili, quivering leaf; but the steam was given the name Haloa.
>
> After that another child was born to them, whom they called Haloa, from the stalk of the taro. He is the progenitor of all the peoples of the earth. (Malo, 1951)

As discussed in Section 3.7, the area has an extensive history of farming that extends well back into the pre-European contact era. Today, one of the most important cultural resources at the UHM campus is Ka Papa Lo‘i o Kānewai. In the early 1980s, a handful of Native Hawaiian students enrolled at the UHM uncovered the remnants of an ancient ‘auwai in bushes alongside Mānoa stream.They discovered that this land, called Kānewai, was highly valued for its kalo productivity even before Kamehameha conquered O‘ahu and remained a royal possession well after the Great Māhele in 1848. Over the years, the property once cultivated by the maka‘ainana, and later by farmers of Chinese and Japanese ancestry, became part of the landscape of the UHM.With the Hawaiian renaissance movement taking shape throughout Hawai‘i, the project Ho‘okahe Wai Ho‘oulu ‘Āina (based on the philosophy, “make the water flow, make the land productive,”) was initiated through the student organization Hui Aloha ‘Āina Tuahine.Uhai and Kolo are the names of the first and the last lo‘i that the water flows through at the first makawai and before flowing through the lo‘i.

Kapa (commonly known as barkcloth) was the traditional material made through a traditional method of gathering, treating, and beating plant fibers, often, but not limited to, wauke (*Broussonetia papyrifera*) to make fabric that was used to make lole (clothing). Pacific and Hawaiian kapa was known for its wide range of colors and the application of watermarks. Similarly, lei making was a regular occurrence in traditional Hawai‘i, which were fashioned from the favorite plant materials that were readily available and abundant in the lei maker’s environment. Lei making continues as an important practice today, as the making and giving of lei as an expression of aloha to loved ones still regularly occurs throughout the Hawaiian Islands. Practitioners of these crafts actively practice in the region, especially hula practitioners who use the forest to gather plants for their ceremonial purposes. The plants on the UHM campus have been utilized for traditional practices, like hula or lei making.

Lā‘au lapa‘au is the practice of traditional Hawaiian medicine. For centuries, Native Hawaiians relied upon the environment around them to provide them medicine. It is still actively taught and practiced today. Medicinal experts or healers have intimate knowledge about plants and other resources to cure ailments illnesses and sicknesses. Traditional medicine is practiced by native peoples and local communities around the world. Similarly, Native Hawaiians, over many generations, have learned how to properly care for, utilize, and prepare plants to maintain the community’s health.

It was important to not only have plants and have access to plants but to ensure that these plants were healthy and in good condition. In the list of biological resources, plants with medicinal capacity and components are identified. These resources are cultural resources. They are critical to the ongoing practice of traditional medicine and healing within the Native Hawaiian community. There are still many traditional medicine practitioners in the Hawaiian community and throughout the Hawaiian Islands today. It is a practice that is still taught to the younger generation, and it is a practice that is still honored and utilized in many Hawaiian households throughout the State.

It was important that medicinal plants existed throughout the Hawaiian Islands so that when people traveled throughout different places on in the islands, they would always have access to the medicine they needed. In some cases, some plants were extremely rare, and, in those cases, it was particularly important to make sure that these populations were well protected and well cared for. There were also numerous gods associated with health, healing, and medicine. The UHM campus has been particularly important for this practice, as it houses a lā‘au lapa‘au program at the Kamakakūokalani Center for Hawaiian Studies that has been essential to preserving this practice and training a new generation of practitioners. Moreover, several plants dispersed across the UHM campus can be used for lā‘au lapa‘au practices.

Kilo are observational traditions and people who examine, observe, or forecast are identified as kilo and serve as traditional climate and weather experts. Kilo “references a Hawaiian observation approach which includes watching or observing [the] environment and resources by listening to the subtleties of place to help guide decisions for management and pono practices”. The practice of kilo is seeing a resurgence on Hawai‘i Island and in the Hawaiian Islands. Kilo hōkū are traditional astronomers, or those who study the stars. A hale kilo or hale kilo hōkū were observatories or star observatories respectfully. Kilo makani were those who traditionally observed the winds. Kilo moana were traditionally oceanographers. Kilo ‘uhane were those who observed and communicated with spirits. Traditionally the practice of kilo or observation was critical to the management of traditional Hawaiian landscapes. This practice is very closely tied to traditional or customary access as observers would require access to specific vistas viewsheds or areas in order to observe environmental phenomenon. Native Hawaiians created a wide range of terms for the environment and understanding the ecosystems around them. These terms were often quite specific, and many were tied closely to a specific geographic area. This level of specify illustrated the close kinship Hawaiians shared to their surrounding environment. The ability to observe and understand all elements of their ecosystem was essential to both the successful care of natural resources and the survival of the Hawaiian people. Kilo has been largely underrecognized as a traditional practice in assessments, but it is a critical practice. The Mānoa campus has played an important leadership role in raising awareness about the importance of this practice and supporting community programming that promotes this practice throughout the State.

The ceremonial practices of traditional Hawaiians are extensive. Throughout the course of Hawaii’s history, traditional Hawaiians have integrated religious, spiritual, and ceremonial practices in their daily lifestyle. Traditional or customary practices are then not distinct ceremonial practices but rather a part of their way of life. Therefore, it is challenging to define in discrete terms ceremonial practices associated with traditional Hawaiian customs. Several ceremonial practices are still practiced at the UHM campus by students, faculty, staff, and the larger community.

Haku mele, oli, and hula are related to the composition of song and chants. this is a practice that has existed for many centuries in the Hawaiian culture. When the Hawaiian culture primarily relied on an oral tradition to pass on knowledge and information, the ability to create songs and chants was essential to pass information from one generation to the next. Songs and chants are largely influenced by the environment around them. As a pedagogical device it was important if not imperative that these songs or chants effectively captured data from the environment around the composer and passed on this information for others to utilize when managing natural resources. In a very real sense, the land and natural resources act as a muse for composers. The category of songs that provide information on or speak to natural resources are called mele ‘āina (songs of the land). As shown in the previous section, there are numerous traditional chants and songs about the project area and its surrounding landscape. Much like mele and oli, hula serves as a way of both honoring place and telling the story of place. Many hula, especially those based on mele ‘āina, require intimate understanding of the place where the mele was composed, including the natural elements of that ‘āina. Hula hālau will regularly take huaka‘i, or journeys, to visit and honor the place a particular mele speaks of. The ability to visit the place and learn about it is important to the practice of hula. Hula, as well as mele or oli, are also offered as gifts to kupuna or gods. This practice also requires access to traditional sites. Associated with hula would have been the practices of lei making and the use of plants to dye clothing. This is another activity that has been largely protected and promoted by the Kamakakūokalani Center for Hawaiian Studies and its programs. The school used to have regular music events and hula hālau have long used the school grounds for their activities.

Ethnographic Data

Ethnographic data is utilized to supplement the other research methods utilized. It is one in a range of research tools employed to gather information about the area. The bulk of the information available from practitioners and kūpuna were drawn from native testimonies and Hawaiian language sources and integrated into the cultural and historic overview of the ARCA. Those sources, along with responses to this Proposed Action were considered when researching the traditional or customary practices discussed herein. Interviews were conducted with two (2) individuals: Ku'ualoha Ho'omanawanui and Trisha Kehaulani Watson-Sproat.

In summary, the information gathered from the ARCA participants voiced the following:

ku‘ualoha ho‘omanawanui, UHM Professor

She is associated with the UHM campus through her work as a professor at the UHM. She has worked at UH Mānoa since 1993, holding her current position since 2007. ku‘ualoha ho‘omanawanui is also an alumnus of UHM, having received her BA, MA, and her PhD at the UHM. She started at UHM as a student in 1985.

ku‘ualoha ho‘omanawanui shared that the UHM once housed several varieties of native trees and plants that are no longer there, perhaps due to development. The UHM campus is home to several varieties of native plants.

Moore Hall was at least partially built on an old Hawaiian graveyard. ku‘ualoha used to work out of that building in the 1980s and 1990s and explained that many of the staff positioned in Moore Hall had spiritual experiences. She heard different stories from maintenance and teaching staff about spiritual activity in the building.

ku‘ualoha listed Ka Papa Lo‘i o Kānewai as a significant cultural resource at UHM. She mentioned that the pond at Kānewai is connected underground to other water sources in Mānoa that go up into the valley, near Mid-Pacific Institute and even further inland. This water source also feeds into the Mō‘ili‘ili area. Kānewai stream is also a significant cultural resource on campus.

ku‘ualoha ho‘omanawanui shared that the land that UHM is situated on was once prime agricultural land with many significant resources in the Mānoa. This amount of rich agricultural land would have been connected to many traditional rituals and practices. In the development of UH many ancient structures connected to agriculture and these rituals were dismantled. In contemporary times, there has been lots of incorporation or intangible practices including mele and oli as part of protocol. Many modern compositions have been written for Mānoa to honor the place. Additional intangible practices include the protocols followed for planting kalo at Ka Papa Lo‘i o Kānewai.

ku‘ualoha ho‘omanawanui expressed that there are bits and pieces of the practice of aloha ‘āina present on campus. The courtyard of Kuykendal Hall, where ku‘ualoha currently works, was made into a sustainability courtyard about 15 years ago. Bamboo, banana trees, and other plants were planted which really changed the landscape. Not long after, all the plants were cut down and the sustainability courtyard has not been properly maintained since. It is where lots of rubbish builds up, attracting mongoose. ku‘ualoha feels that there should be more kukui trees and native plants on campus. ku‘ualoha also discussed her hopes to see both Kuykendall and Snyder Halls have their names changed.

When ku‘ualoha started on campus, there was no lo‘i. The entire area was just weeds until it was restored and Ka Papa Lo‘i o Kānewai was established. She feels that the lo‘i is one of the most culturally significant places on campus. She discussed how today people take the lo‘i and the Hawaiian studies building for granted, but both of these places are significant. Charlie Kupa, Kū Kahakalau, Ku‘umealoa Gomes, Pōhaku De la Santos, Keoni Fairbanks, and Analu Okamura are the ones who founded this cultural resource. ku‘ualoha expressed that the University does not really acknowledge the grassroots efforts that went into restoring the lo‘i at Kānewai. The area used to be a gravel pit of weeds and was transformed and restored to what it is today. ku‘ualoha shared that when the University was first discussing building a Hawaiian Studies building they wanted to put it where the lo‘i is to preserve parking. Haunani Kay-Trask fought this and helped ensure that the building did not cover the cultural resources that the lo‘i and stream are.

ku‘ualoha shared that the development of the Hawaiian Studies building created a lot of strife on campus, particularly between the Hawaiian language and Hawaiian studies students and staff. Protests were held on campus at this time. Lilikalā Kame‘eleihiwa decided to build an ahu at the side of the construction site and right after the ahu was built a student died directly in front of the ahu. The student was going down Dole Street on a moped and ku‘ualoha was in a vehicle behind them. Right when the student rode in front of the ahu, a state truck pulled out of the driveway and hit and killed the male student. ku‘ualoha was a witness to this and feels it is connected to Hawaiian spirituality and the idea that you should be cautious when erecting spiritually significant structures.

Iwi were found during construction of the building. The center of the building has an area where the iwi were situated and ti leaf were planted to keep people out of the area.

ku‘ualoha ho‘omanawanui shared that most of the campus has been heavily developed but did share that she feels there is possibility that any new development would unearth more iwi. She also mentioned the concern of displacing any native plants which are cultural resources.

Dr. Trisha Kehaulani Watson-Sproat, Lineal Descendant

Having grown up both on campus and in Mānoa, Dr. Watson-Sproat possessed a lot of knowledge about the campus and Mānoa. Dr. Watson-Sproat spoke at length about Mānoa and its relationship to the University.

There are many native plants and animals in the valley. She notes that she is very grateful for Lyon Arboretum. She considers the aboretum a critical cultural resource for the campus.

She‘s heard of important trees on campus. She‘s been told that there were two beautiful hala trees by Hawai‘i Hall that lauhala makers used to gather from on a regular basis. These were removed when Hawaii Hall was rennovated. She imagines there are other valuable trees or plant resources on campus. Any rennovations should be careful not to adversely impact these sorts of resources. Native trees should be preserved.

Mānoa Stream is also a very important cultural resource. She has observed that there are waterbirds that use the stream as habitat. When she was growing up, they would play in the stream a lot. There are various fish and ‘ōpae in the stream. She would catch them with nets, but she never ate them. She‘d throw them back. She also remembers that before the Mānoa Innovation Center was built, there were horses on those lands. The Mānoa Road had a lot of agricultural lands, she doesn‘t know if those lands have been converted to residential lands. She feels like Kānewai has become a very critical cultural resource for all of Mānoa.

She also notes how important the stream is for Kānewai. She thinks the campus should do much more to recognize the lo‘i, its traditional and modern histories, and ongoing work. She considers it a spiritual place as well as a learning environment. She notes that many native animals have come back since the lo‘i has opened, like Manu-o-Kū. There‘s also lots of native plants that grow in that environment. She thinks this sort of wider community opportunities are really important for other Native Hawaiian children and students who like in urban areas like Honolulu. She also believes that the lo‘i has been blessed with the many knowledgable kūpuna who helped to make it what it is today, including Uncle Eddie Kaanaana and Uncle Jerry Konanui.

She remembers the October 30, 2004 flood well. The flood destroyed a lot of the resources in the basement of Mānoa Library, which included a lot of their historic maps. The flood also washed through the lo‘i and did a lot of damage to the crops that were growing, but she remembers that the hale had little damage and remained standing. She feels this is a testament to the intelligence and innovation of Hawaiian architecture. She feels like important things like this don‘t get enough attention. She also feels that the lo‘i served as a flood plain and likely prevented a lot of damage downstream.

Dr. Watson-Sproat noted that many people, including students at Mānoa, do not know that the ahupua‘a is actually Waikīkī, not Mānoa. Mānoa is the valley, but upper campus is part of the Mānoa area. There are also many, many place names, including Wa‘ahila (which is the ridge on the east side of campus), Kānewai (where the lo‘i is located), and Kalaepōhaku (east of campus where St. Louis School is located).

Mānoa was known for its lo‘i. There are beautiful images of Mānoa with acres and acres of lo‘i across the valley. Mānoa was also broken into two sides: Mānoa Ali‘i and Mānoa Kānaka. The ali‘i side is the west side, where Wai‘oli Tea Room is. The kānaka side is the Woodlawn Drive side. Many ali‘i lived in Mānoa, including Ka‘ahumanu, who died in Mānoa Valley.

There were not many Hawaiians in the valley when she was growing up. There was Aunty Ethelyn Ka‘aihue on Mānoa Ave. Aunty Amelia Bailey was down the road from her on O‘ahu Ave. Aunty Hattie Phillips on Mānoa Ave across from Mānoa Elementary School. The Shims were across the valley. Aunty Amelia was a very famous lei maker. Aunty Hattie and her family ran the Holokū Ball at Punahou. Both their families carry on their traditions. She would like to see more places on campus named for the kūpuna and ali‘i of Mānoa.

She thinks that Aloha ‘Āina has become a practice on the UHM campus. Many of the modern movements that occur today have connections to the UHM campus and the people on campus. She remembers the GMO marches well. This was before social media. The Hāloa that is in Kānewai today was made at Keawanui Fishpond on Moloka‘i. She was there while it was being made. Ua (Ritte) and Hanohano (Na‘ehu) made it from a mango wood slab. She thinks it went to Bachman first. Then it went down to the Capitol at an ahu Uncle Walter made there. Then it was at Kamakakuokalani on Dole St. She‘s not sure when it came to rest where it is now, but it is an important symbol of that time and movement.

Impacts and Mitigation Measures

The UHM, as it sits on both ceded lands and an important traditional place, supports some important cultural activities, including research into mo‘olelo, agricultural activities, hula, oli, care of the kahawai (stream), and the creation of Hawaiian arts and crafts. These should be enhanced across the UHM programming and integrated into the Proposed Action. While there is currently no indicator that the Proposed Action as currently defined will adversely impact traditional or customary practices, it is an opportunity to enhance these practices. The UHM’s and community’s Native Hawaiian community should be heavily consulted with and engaged in the Proposed Action as it continued to be developed and is later implemented.

Interviewees identified a plethora of possible cumulative impacts of the Proposed Action. ku‘ualoha ho‘omanawanui shared that she would like to see facilities for students and teaching prioritized over administrative additions, like traffic management centers. She shared that there is a classroom shortage on campus and a need for more teaching facilities. This issue makes it so both teachers and students have less flexibility in their schedules. More classrooms would allow for adaptive schedules for both students and staff. ku‘ualoha expressed a desire to see more adaptive classroom structures that include

outdoor classrooms. Right now, there are only traditional learning spaces that are indoors. She would like to see indoor-outdoor learning spaces. She would also like to see culturally dedicated sites, like a hula pā or native food and plant gardens, to make UH more of a cultural resource and a Hawaiian place of learning.

Dr. Watson-Sproat hopes the Proposed Action will enhance cultural resources and practices. She thinks it needs to be specific in the plan or it will not happen. She feels the UHM does not do enough to root itself in place, specifically its traditional place. Few of the faculty are actually from Mānoa and have that pilina (connection) to Mānoa. She feels the UHM faculty talk about the importance of tradition, but she wishes there were more ties to the lineal descendants of Mānoa or Waikīkī as a Hawaiian place. She also feels the UHM needs to have better connectivity to Mānoa and Mō‘ili‘ili. For example, the Upper Campus path to Mānoa is really important. Dr. Watson-Sproat is sad that Saint Francis has closed; she felt that was a really important campus resource. She sent her son there for pre-school when she was in school and worked at the UHM. She hopes the UH buys the property and moves the lab school there or a similar resource for campus families. She would love to see it become a dorm, or have Hawai‘inuiākea move there and have a dorm for their students. She feels like there are not enough resources for families of students or faculty. She also recognizes that Lower Campus is trying to connect to Mō‘ili‘ili, but the only real routes to that area are through the gate on Lower Campus behind Stan Sheriff or down University Avenue. She is not sure why there is not more pedestrian activities in this area. She also notes that this area has become increasingly dangerous, as there are lots of houseless people in the area now. This is fairly new and did not exist while she was growing up in the area.

Dr. Watson-Sproat feels every student who goes to Mānoa should have to learn about the valley and its traditional places and histories. She also thinks service to the campus / surrounding community and this cultural education should be a graduation requirement. Service could be at Kānewai, Lyon Arboretum, or community organizations like the Kumuola Foundation. Having students work on the land should not be limited to those who take classes at Kānewai or in Hawai‘inuiākea, it should be a requirement for every student in every field.

She wishes the UHM had done a better job of documenting the practitioners from the valley. Many of these kūpuna have passed away and much of their knowledge has gone with them. Traditional knowledge and book knowledge are not the same, and while the UHM does an excellent job of providing young Hawaiians opportunities to learn, it would have been nice to better integrate the Hawaiians from the specific place the UHM was built on. Some good people to invite as resources of this traditional knowledge would be Manu Boyd and Uncle Kimo Keaulana. She also thinks the lo‘i has always benefitted from having kūpuna as resources there for the haumāna. Kūpuna like Uncle Eddie, Uncle Maka, or Uncle Jerry were very important to making it the thriving environment it is today. She still thinks the University needs to find a way to create a Ph.D. (or equivalent) for master cultural practitioners, like Kumu Hula.

She would also like to see more art murals around campus that honor the traditional mo‘olelo of Mānoa and Mō‘ili‘ili. She also thinks one of the most important accomplishments on campus was Haunani ensuring Kamakakūokalani was filled with native art by native artists.

She also thinks there should be much more native flora on campus, especially kūkui. That‘s one thing she particularly loves about Kānewai – it‘s kūkui trees. The trees are symbolic and a wonderful resource for practitioners. She notes that other campuses use landscaping to build their identify (i.e., like “Ivy League” schools), Mānoa should plant kūkui trees across campus. She thinks the shower trees should definitely be replaced with kūkui trees. This would be a good symbolic tree to place throughout campus and its an important cultural resource.

3.9 Air Quality

The State of Hawai‘i DOH, Clean Air Branch, monitors the ambient air quality in the State for various gaseous and particulate air pollutants. The U.S. Environmental Protection Agency has set national ambient air quality standards (NAAQS) for six principle air pollutants (referred to as criteria pollutants) that are common outdoor air, considered harmful to public health and the environment, and that come from numerous and diverse sources. The six criteria pollutants are carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), ozone (O_3), and particulate matter (PM_{10} and PM_2). Hawai‘i has also established a state ambient air standard for hydrogen sulfide (H_2S) related to volcanic activity on Hawai‘i Island. The primary purpose of the Statewide monitoring network is to measure ambient air concentrations of these pollutants and ensure that these air quality standards are met. Areas where concentrations of criteria pollutants are below the NAAQS are designated by the EPA as being in “attainment”, whereas areas where concentrations of criteria pollutants exceed the NAAQS are designated as being in “nonattainment.” The CCH has never been classified as nonattainment for any criteria pollutant.

Air pollution in Hawai‘i is caused by many different anthropogenic and natural sources. There are industrial sources of pollution, such as power plants and petroleum refineries; mobile sources, such as cars, trucks and buses; agricultural sources, such as crop burning, and natural sources, such as windblown dust and volcanic activity. The DOH Clean Air Branch is responsible for regulating and monitoring pollution sources to ensure that the levels of criteria pollutants remain well below the State and Federal ambient air quality standards. At the State level, air quality standards (“HIAQS”) are defined in Section 11-59, HAR, Ambient Air Quality Standards.

The State of Hawai‘i DOH, Clean Air Branch maintains and operates three air quality monitoring sites on the island of O‘ahu: Honolulu, Pearl City, and Kapolei. The monitoring sites measure ground-level concentrations of criteria pollutants where most commercial, industrial and transportation activities and their associated air quality effects occur. Hawaiian Electric Company’s downtown power plant is the primary stationary source, while vehicular traffic represents the principal mobile contributor. Emissions from the power plant are in compliance with State and Federal air pollution control regulations. Air quality at the UHM campus, is generally considered to be good due to its location in relation to major thoroughfares (located makai of the UHM campus) and the typical flow of fairly constant northeasterly trade winds that disperse pollutants seaward.

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts on air quality are anticipated as a result of the construction and operation of the Proposed Action. In the short-term, it is anticipated that the various construction activities associated to the Proposed Action will result in the irrevocable release of GHGs. Construction related emissions include tailpipe emissions

from construction equipment, delivery trucks, and workers commuting to and from the construction site. It is anticipated that the quantities of GHGs released from construction related activities will be negligible and usage of each piece of equipment would be sporadic and not simultaneous. Moreover, the contractors for the construction of the applicable projects will be required to prepare a dust control plan compliant with the provisions of Chapter 11-60.1, HAR, Air Pollution Control.

In the long-term, it is anticipated that the Proposed Action will provide beneficial impacts to the air quality with regards to emissions generated by the UHM campus. As noted in Section 2.1, the UHM seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. Moreover, the UHM is striving to transform from a commuter campus to a pedestrian-centered place of learning. To achieve this goal, the UHM intends to reduce parking accommodations; prioritize pedestrian pathways and wayfinding on the Central Campus; develop alternative transit solutions to one-driver-one-car such as a transit hub, developing an off-campus parking strategy, and anticipating future mobility changes; and create velocity-based on-campus hierarchy of circulation.

3.10 Noise

Noise levels are measured in units called decibels; a numeric system expressed on a logarithmic scale. Since the human ear does not perceive all pitches or frequencies equally, noise levels are adjusted, or weighted to correspond to human hearing. This adjusted unit is known as the A-weighted decibel, or dBA. Local and federal agencies have established guidelines and standards for assessing environmental noise impacts, as well as setting noise limits as a function of land use. The following is a brief description of the guidelines and common acoustic terminology.

The United States Federal Highway Administration (FHWA) defines seven activity categories with corresponding maximum hourly equivalent sound levels($L_{eq(h)}$) for traffic noise exposure as shown in Table 3-5 below.

Table 3-5: FHWA Noise Abatement Criteria for Highway Noise

Activity Category	Activity Category Description	Hourly Equivalent Sound Level ($L_{eq(h)}$)
A	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.	57 dBA (Exterior)
B	Residential	67 dBA (Exterior)
C	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hosptials, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or	67 dBA (Exterior)

	nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(F) Sites, schools, television studios, trails and trail crossings.	
D	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.	52 dBA (Interior)
E	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.	72 dBA (Exterior)
F	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilties, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.	N/A
G	Undeveloped lands that are not permitted	N/A

The State of Hawai'i Department of Transportation (HDOT) has adopted FHWA's design goals for traffic noise exposure in its 2016 noise analysis and abatement policy, titled *Highways Noise Policy and Abatement Guidelines*. According to the policy, a traffic noise impact occurs when the predicted traffic noise levels "approach" or exceed FHWA's design goals or when the predicted traffic noise levels "substantially exceed the existing noise levels." In the policy, "approach" means at least 1 dBA less than FHWA's design goals and "substantially exceed the existing noise levels" means an increase of at least 15 dBA. Although the Proposed Action is not an FHWA Type 1 project and therefore not under HDOT jurisdiction, these thresholds are used as guidelines for evaluating the potential for and mitigation of project-generated noise impacts.

The noise descriptor currently used by the Federal Housing Administration (FHA) Housing and Urban Development (HUD) to assess environmental noise is the Day-Night Average Sound Level (Ldn or DNL). This descriptor incorporates a 24-hour average of instantaneous A-weighted Sound Levels as read on a standard sound Level Meter. By definition, the minimum averaging period for the DNL descriptor is 24 hours. Additionally, sound levels which occur during nighttime hours of 10:00 PM to 7:00 AM are increased by 10 decibels(dB) prior to computing the 24-hour average by the DNL descriptor.

The State, pursuant to Section 11-46, HAR, Community Noise Control, defines three classes of zoning districts that specifies the maximum permissible sound levels due to stationary noise sources (e.g., Air-conditioning units, exhaust systems, generators, compressors, pumps, etc.) in each zone. The rule does not address most moving sources, such as vehicular traffic, air traffic noise, or rail traffic noise, however it does regulate noise related to construction activities. The maximum permissible noise levels are enforced by the DOH for any location at or beyond the

property line and shall not be exceeded for more than 10% of the time during any 20-minute period. The specified noise limits are a function of the time of day and land use zoning designation; the rule specifies that the primary land use designation shall be used to determine the applicable zoning district class and the maximum permissible sound level. Background noise level is taken into account by the DOH when determining the maximum permissible sound level.

Table 3-6, below presents land use compatibility guidelines for various level of environmental noise as measured by the DNL descriptor system pursuant to DOH limits of noise allowed in different zoning districts.

Table 3-6: Noise Standards

Zoning District	Zoning equivalent	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Class A	Residential, Conservation, Preservation, Public Space, or Similar Type	55	45
Class B	Multi-Family Dwellings, Apartments, Business, Commercial, Hotel, Resort, or Similar Type	60	50
Class C	Agriculture, Country Industrial, or Similar Type	70	70

Source: HAR Title 11, DOH, Chapter 46 Community Noise Control

Generally, noise levels of 55 DNL or less occur in rural areas, or in areas which are removed from high volume roadways. In urbanized areas which are shielded from high volume streets, DNL levels generally range from 55 to 65 DNL, and are usually controlled by the motor vehicle traffic noise. Residences which front major roadways are generally exposed to levels of 65 DNL, and as high as 75 DNL when the roadway is a high speed freeway , such as H-1 Freeway. Due to noise shielding effects from intervening structures, interior lots are usually exposed to 3 to 10 DNL lower noise levels then the front lots which are shielded from the noise traffic.

For the purposes of determining noise acceptability for funding assistance from Federal Agencies, an exterior noise level of 65 DNL or lower is considered to be acceptable. This standard is applied nationally, including in the State of Hawai'i. Due to the open-living conditions here in the State of Hawai'i, the predominant use of naturally ventilated dwellings, and the relatively low exterior-to-interior sound attenuation afforded by these naturally ventilated structures, an exterior noise level of 65 DNL does eliminate all risks of noise impacts. Due to these factors, a lower level of 55 DNL is considered to be “Unconditionally Acceptable” (or “Near-Zero Risk”) level of exterior noise. For typical, naturally ventilated structures in Hawai'i, an exterior noise of 55 DNL results in an interior

level of approximately 45 DNL, which is considered to be the “Unconditionally Acceptable” level of interior noise.

Human sensitivity to changes in sound pressure level is highly individualized and can depend on frequency content, time of occurrence, duration, and psychological factors such as emotions and expectations. However, the average ability of an individual to perceive changes in noise levels is well documented by the EPA in their 1977 report titled *Toward a National Strategy for Noise Control*, which has been summarized in Table 3-7 below. These guidelines permit direct estimation of an individual’s probable perception of changes in noise levels.

Table 3-7: Average Ability to Perceive Changes in Noise Level

Sound Level Change (dBA)	Human Perception of Sound
0	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	Two times (or 1/2) as loud
20	Four times (1/4) as loud

Source: Toward a National Strategy for Noise Control (1977)

A commonly applied criterion for estimating a community’s response to changes in noise level is the ‘community response scale’ proposed by the International Standards Organization (ISO) of the United Nations, as shown in Table 3-8 below. The scale relates changes in noise level to the degree of community response and allows for direct estimation of the probable response of a community to a predicted change in noise level. The values presented are based on statistical analysis of data collected from previous projects in which ambient noise levels increased in the surrounding community, thus it is only a rule of thumb for estimating community response and not a prediction for the Proposed Action expected community response.

Table 3-8: Community Response to Increase in Noise Levels

Sound Level Change (dBA)	Category	Response Direction
0	None	No observed Reaction
5	Little	Sporadic Complaints
10	Medium	Widespread Complaints
15	Strong	Threats of Community Action
20	Very Strong	Vigorous Community Action

Source: International Standards Organization of the United Nations

As part of this EA, Y. Ebisu & Associates conducted an acoustic study to estimate the potential noise related impacts specifically related to the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project on Lower Campus (See Appendix G). This acoustic study is summarized below.

Lower Campus

The primary objective of the acoustic study was to describe the existing and future noise environment in the environs on Lower Campus regarding the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project. It should be noted that for the acoustic study,

traffic forecasts were not available for future years with and without the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project (discussed in more detail in Section 3.12 below). Thus, it was not possible to estimate the traffic noise increases resulting from spectator vehicle trips to and from the Lower Campus associated with UH Football events at the Clarence T.C. Ching Athletic Complex. Existing traffic noise levels during a Saturday in 2021 were estimated along the public roadways which are expected to service the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project. It should be noted, however, a full recovery from the COVID-19 pandemic had not occurred at the time the acoustic study was conducted in 2021. Thus, traffic counts obtained in 2019 by the HDOT were used to estimate traffic noise levels during a weekday prior to the COVID-19 pandemic. From these estimates of Base Year noise levels, generalizations of possible traffic noise increase during a UH Football event on Saturday were projected.

The existing background ambient noise levels within the Lower Campus are controlled by traffic along the H-1 Freeway and its On- and Off-Ramps between Kalele Road to the east and University Avenue to the west, Waialae Avenue, University Avenue, and Dole Street. Existing traffic noise level were measured at three locations (A, C and G) in the environs on Lower Campus regarding the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project to provide a basis for developing the project's potential traffic noise contributions along the roadways which are anticipated to service the Clarence T.C. Ching Athletic Complex. In order to describe the existing background noise levels at existing residences and churches closest to the Clarence T.C. Ching Athletic Complex, long-term measurements of these background noise levels were obtained at four locations (B,D, E, and F) (See Figure 3-15)**.** The long-term background noise measurements were obtained on a Saturday, and from approximately 3:00 p.m. to 10:00 p.m.

The results of the traffic noise measurement were compared to calculations of existing traffic noise levels to validate the computer model used. The traffic noise measurement results, and their comparison with noise model predictions are summarized in Table 3-9 below. The "Predicted Leq(dB)" column results were developed using the observed traffic volumes and average speed.

Table 3-9 Existing Lower Campus Traffic and Background Noise Measurements

Location	Time of Day	Avg. Speed	Hourly Traffic Volume			Measured	Predicted
	(HRS)	(MPH)	Auto	M. Truck	H. Truck	Leq(dB)	Leq(dB)
A. 50 Ft from the centerline of Waialae Ave.	1540 to 1640	41	1,440	11	13	67.6	67.7
	2050 to 2150	42	729	6	9	65.2	65.2



FIGURE 3-15

NOISE MEASUREMENT LOCATION MAP

UNIVERSITY OF HAWAIʻI AT MĀNOA LONG RANGE DEVELOPMENT PLAN

WILSON OKAMOTO CORPORATION

Location	Time of Day	Avg. Speed	Hourly Traffic Volume			Measured	Predicted
	(HRS)	(MPH)	Auto	M. Truck	H. Truck	Leq(dB)	Leq(dB)
B. UH ROTC Parking Lot (5/15/21)	1500 to 2200	N/A	N/A	N/A	N/A	52.1 to 54.5	N/A
C. 75 FT from the centerline of University Ave. (5/15/21)	1528 to 1628	32	1,383	4	17	63.3	63.4
D. At UH Hale Wainani Parking Lot. (5/22/21)	1500 to 2200	N/A	N/A	N/A	N/A	46.4 to 54.8	N/A
E. 50 FT from Centerline of Dole Street. (5/22/21)	1512 to 1612	41	408	3	10	61.9	61.7
	2030 to 2130	41	227	1	2	57.7	57.9
F. At UH Center on Disability Studies. (5/29/21)	1500 to 2200	N/A	N/A	N/A	N/A	55.1 to 58.2	N/A
C. 75 FT from the centerline of University Ave. (5/29/21)	1500 to 1600	30	1,391	3	16	63.0	62.9
	2050 to 2150	35	532	1	9	60,6	60.6
G. At the UH Music Building Parking Lot. (6/05/21)	1500 to 2200	N/A	N/A	N/A	N/A	58.0 to 63.4	N/A

The existing traffic noise levels in the environs on Lower Campus along the first row of lots fronting H-1 Freeway and Waialae Avenue during a weekday or Saturday are in the “Significant Exposure, Normally Unacceptable” category by current Federal standards for residences, and greater than 65 DNL. Behind the frontage lots, the first row of buildings typically attenuate traffic noise levels due to shielding effects of 4 to 9 dB per row of buildings. Distance effects between the residences and the roadways add additional 2 to 4 dB of attenuation at the second and third row of lots from the roadways.

Along University Avenue in the vicinity of the ingress and egress routes to the UHM campus driveways, Base Year weekday noise levels at two religious facilities mauka of H-1 Freeway are approximately 65 DNL and are less than 65 DNL on Saturdays. The approximate distances to Base Year 65 DNL contours on weekdays and Saturday are 83 and 65 feet, respectively, from the centerline of University Avenue.

Along Dole Street in the vicinity of the University Avenue intersection, the location of the weekday and Saturday Base Year 65 DNL contours are approximately 28 to 29 feet from the centerline of Dole Street, with essentially all of the residences located outside of these distances. For these reasons, Base Year traffic noise levels at existing residences along Dole Street between Wilder Avenue and University Avenue, do not exceed 65 DNL. Similar conclusions apply to the student units located on Dole Street toward East-West Road.

Impacts and Mitigation Measures

Based on estimates of existing Base Year traffic noise levels at noise sensitive receptors along Waialae Avenue, University Avenue, and Dole Street, estimates of the potential increases in existing DNL resulting from UH Football games on Saturday at the under the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project were made. The potential increases in traffic noise levels over existing levels were calculated with the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project and noise impacts were evaluated.

Noise impacts at existing noise sensitive receptors resulting from Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project related traffic along the surrounding roadways which are expected to service the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project are considered to be negligible. On a Saturday with a UH Football game at the Clarence T.C. Ching Athletic Complex, increased traffic volumes and traffic noise levels during the late period prior to the football game are expected from outbound traffic exiting the UHM campus. Increases in the Saturday DNL values a caused by the football game traffic are expected. However, the overall annualized increases in traffic noise DNL values are predicted to not exceed 1.0 DNL, due to the much larger influence of the recurring weekday Saturday traffic noise levels for 52 weeks per year at area receptors. Exceedance of the 65 DNL FHA/HUD standard from traffic noise are expected at receptors fronting the major roadways and ramps but should not be driven by the increases in Saturday game traffic. Traffic noise mitigation measures in the form of closure and air conditioning will probably be the most common noise mitigation measure used at noise impacted receptor locations.

Measurements of crowd noise levels during an NFL football exhibition game with approximately 30,000 spectators on August 17, 2019, at Aloha Stadium were obtained approximately 1,100 feet from the center of Aloha Stadium, and were used to measure the A-Weighted sound level and frequency spectrum of amplified public address announcements and crowd noise. Measured maximum crowd noise level was 73 dBA at 1,100 feet. The results from these measurements were used to project the potential noise levels during UH Football games from the various bleacher sections at the Clarence T.C. Ching Athletic Complex. Assumed levels of crowd noise range from 70 dBA at 200 feet from the 612 seat bleacher section to 75 dBA at the 2,096 seat bleacher section. Predicted crowd noise levels during a UH Football game were calculated at residential areas closest

to the Clarence T.C. Ching Athletic Complex for the purpose of evaluating and comparing the potential crowd noise levels at these closest residences.

The Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project is anticipated to create additional concentrations of high-level noise emitters in the form of crowd noise during UH Football games. Maximum crowd noise levels within the bleacher seating areas are expected to be within the 85 to 95 dBA range and are characterized as being intermittent rather than continuous. Predicted maximum crowd noise levels at six of residential receptors locations along the Diamond Head and makai boundaries of Lower Campus were calculated. Assumed crowd noise levels from the various bleacher sections ranged from 60 dBA at 200 feet from a 74 seat section to 75 dBA at 200 feet from a 2,165 seat bleacher section. Directivity effects were applied to the crowd noise components emanating from each of the bleacher sections, with 0 dBA reduction on-axis toward the football field, 3 dBA reduction at 90 degrees from the on-axis direction, and 8 dBA reduction toward the rear of each bleacher section.

Potential sound levels during PA System announcements at the Clarence T.C. Ching Athletic Complex were also calculated using the planned single speaker at the proposed location of the scoreboard on the roof of Les Murakami Stadium. The potential range of sound levels during PA System announcements were assumed to be from 95 to 102 dBA at 200 feet distance from the scoreboard speaker, with the higher PA System level required to achieve 90 dBA at the farthest ʻEwa bleachers at the Clarence T.C. Ching Athletic Complex. Potential spillover sound levels during the PA System announcements at the closest residences east and south of the Clarence T.C. Ching Athletic Complex were calculated. It is assumed that in order to be intelligible during a UH Football game, the sound levels of the PA announcements would need to be at least 90 dBA at the furthest spectator at the west (or ʻEwa) end zone bleacher section. This assumption was used to model the PA System Speaker output as 102 dBA at 200 feet on-axis, and to calculate the maximum PA system sound levels at the six receptors locations. Speaker directivity effects were also included in these calculations as follows: 0 dBA attenuation on-axis; 10 dBA attenuation at 90 degrees from on-axis; and 15 dBA to the rear of the speaker. Predicted maximum sound levels from the PA system speaker were; 93 dBA at the Mauka Grandstand; 92 dBA at the ʻEwa bleachers; 109 dBA at the Diamond Head Bleachers; and 92 dBA at the Makai bleachers.

These maximum sound levels are relatively high when compared to the relatively low background noise levels at the receptor locations. Typically, the louder noise events were not continuous, and their frequencies of occurrence were less than 50 to 25 percent. While the sound levels associated with sporting events like baseball or football games will exceed other background noises during the event, their average sound levels will typically not exceed current land-use compatibility thresholds such as the 65 DNL Federal noise standard. In summary, it is anticipated that the PA System may exceed the 65 DNL standard on gameday at various times throughout the event but will not exceed the standard throughout the year. To mitigate the acoustical impacts from the PA System, it is recommended that:

- While it is a general design goal to provide a sufficient sound level from the PA System to overcome the sound masking effects of crowd noise, adjusting the maximum sound level of the PA System to compete with the highest level of crowd

noise should be avoided. Instead, use the PA System for voice announcements during bursts of high levels of crowd noise should be avoided, with voice announcements timed to occur during the quieter periods of the football game between bursts of the louder crowd noise; and

- The use of a 95 dBA at 200 feet PA System scoreboard speaker should be considered a mitigative measure. With this measure, the PA System sound levels presented in the acoustic study will be reduced by 7 dBA, but the PA System sound levels in the Mauka Grandstand, ‘Ewa, and Makai bleachers would be apprimately 4 to 5 dBA below the 90 dBA goal for PA System sound level.

Calculations of average exterior and interior noise levels from construction activities were performed for typical naturally ventilated and air-conditioned dwellings. Predicted noise levels were compared with existing background ambient noise levels, and the potential for noise impacts was assessed.

In the short-term, audible construction noise will be unavoidable for the various projects under the Proposed Action. The total time period for construction is unknown, but it is anticipated that the actual work will be moving from one location on the UHM campus to another during that period. Actual length of exposure to construction noise at any receptor location will probably be less than the total construction period for the Proposed Action. Figure VI-4 of Appendix G depicts the range of noise levels of various types of construction equipment when measured at 50 feet of distance from the equipment. Typical levels of exterior noise from construction activity involving diesel engine powered equipment (excluding pile driving activity) at various distances from the job site are shown in Figure VI-5 of Appendix G. The impulsive noise levels of impact pile drivers or hammers or hoe rams are approximately 15 dB higher than levels as shown in Figure VI-5 of Appendix G.

The existing residences along the south boundary in the vicinity of Lower Campus may experience the highest noise levels during the construction activities due to their close proximity to the UHM Campus and New Construction/Replacement of Existing Structures (Net Increase) Projects. Noise from the construction is not expected to adversely affect public health and welfare due to the temporary nature of the work, relatively high background noise levels at the closest residence which front major roadways, and due to the administrative controls available for regulation of construction noise. Instead, these impacts will be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the UHM campus. Mitigation of the construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise course (70 dB at 300-foot distance), and due to the exterior nature of the work. The use of properly muffled construction equipment should be required on the job site. With regards to classrooms in proximity to construction activities, it is recommended that the use of sound attenuating barriers between the construction site and classroom buildings be used during classroom hours, as appropriate. Also, temporary air conditioning can also be used to reduce construction noise impacts on classes.

Construction noise impacts can be mitigated by compliance with provisions of the State DOH Administrative Rules, Title 11, Chapter 46, “Community Noise Control” regulations. These rules require a noise permit if the noise levels from construction activities are expected to exceed the allowable levels stated in the DOH Administrative

Rules. Under these regulations, the UHM campus is situated within a Class A district. Therefore, the maximum permissible sound levels for construction activities are 60 dBA during daytime (7:00 a.m. to 10:00 p.m.) hours and 50 dBA during nighttime hours (10:00 p.m. to 7:00 a.m.). These levels may not be exceeded at or beyond the property line for more than 10 percent of any continuous 20-minute period. It shall be the contractor's responsibility to minimize noise by properly maintaining noise mufflers and continuous 20-minute period. It shall be the contractor's responsibility to minimize noise by properly maintaining noise mufflers and other noise-attenuating equipment, and to maintain noise levels within regulatory limits. Also, the guidelines for heavy equipment operation and noise curfew times, as set forth by the DOH noise control rules, will be adhered to; or, if necessary, a noise permit shall be obtained.

3.11 Hazardous Materials

A hazardous material item is generally characterized as any item or agent (physical, chemical, or biological) which has the potential to cause harm to humans, animals, or the environment, either independently or through interaction with other factors. Toxic materials are specific hazardous materials identified in regulations. Hazardous wastes are specifically defined or determined as such based on their ignitability, corrosiveness, reactivity, and toxicity. The potential impacts hazardous materials and waste have on human health and the environment are largely dependent upon their types, quantities, toxicities, and management practices.

Hazardous wastes may take the form of a solid, liquid, contained gas, or semi-solid. In general, any combination of wastes that poses a substantial present or potential hazard to human health or the environment that has been discarded or abandoned is a hazardous waste.

EPA and Hawai'i universal waste regulations streamline hazardous waste management standards for Federally-designated "universal wastes," which include: batteries, pesticides and mercury-containing materials. Universal wastes are considered hazardous, however, they are subject to less restrictive waste disposal regulations than for hazardous wastes.

Hazardous wastes, including used oils, antifreeze and solvents associated with construction are handled and disposed of by licensed contractors.

Construction activities associated with the implementation of the Proposed Action improvements may involve the use of materials and processes that involve chemical agents or materials typical to construction that could be considered hazardous. These materials are primarily associated with vehicle and/or equipment maintenance that typically include flammable and combustible liquids, acids, aerosols, batteries, corrosives, solvents, paints, and hydraulic fluids.

High levels of Chlordane, a pesticide, are known to exist in the soils on the UHM campus. The maximum concentration of chlordane detected in soil on the UHM campus was 25 mg/kg near the Hamilton Library. The DOH's Environmental Action Level (EAL) for chlordane in soil is 16 mg/kg. Without adequate control, this pesticide may pose a risk to workers and/or the general public during construction activities.

Due to the age of some of the facilities and structures on the UHM campus slated for work under the Proposed Action, hazardous materials, including but not limited to asbestos, lead-based pain, polychlorinated biphenyls (PCBs), creosote, and arsenic are likely to be found throughout the

buildings. Without adequate control, renovation and demolition activities may release these hazardous materials to the environment.

Impacts and Mitigation Measures

It is expected that hazardous materials will be encountered during construction, demolition, and renovation of the various facilities under the Proposed Action within the UHM campus. Hazardous materials are likely to also be encountered in soil below ground surface, within the physical structure of the impacted facilities, and as part of the physical property of individual tenant organizations.

A base-line soil sampling survey is recommended to be conducted in building demolition areas and for any areas that will be graded or left as open ground within 3-5 feet of an existing building's foundation that workers and later students may potentially be exposed to contaminated soil. If chlordane is detected during the baseline survey, a chlordane workplan may be required by the Environmental Health and Safety Office, Environmental Compliance Program.

During construction and development of the Proposed Action, there may be the potential of petroleum spillage associated with construction vehicles and equipment. In order to minimize the possibility for spills of hazardous materials, the following is recommended if and when the various projects under the Proposed Action are implemented:

- Unused materials and excess fill will be disposed of at an authorized waste disposal site.

Hazardous materials, including chemicals, petroleum-based projects, and waste materials, including solid and liquid waste, would be stored in areas specifically designed to prevent discharge into storm water runoff. Areas used for storage of toxic materials would be designed with full enclosure in mind. The work associated with the Proposed Action would require the removal of asbestos materials if encountered, and the Asbestos Abatement Office would need to be contacted. These remediation activities would comply with all established regulations and procedural guidelines.

Design features specific to the reduction of the potential effects of hazardous spills will be implemented, where appropriate.

Prior to demolition, renovation, or removal of a structure under the Proposed Action, a survey should be conducted to determine if hazardous material is present. Any fibrous or suspected asbestos-containing material (ACM) should be sampled and analyzed at a U.S Department of Commerce - National Voluntary laboratory Accreditation Program (USNVLAP) accredited microscopic laboratory. The removal of Regulated Asbestos Containing Building Material (RACM) is required for all RACM that exceeds the threshold limits as defined in the regulations promulgated as the National Emissions Standards for Hazardous Air Pollutants (NESHAPS). All RACM must be removed prior to routine demolition and renovation activities that will disturb the material. Removal of the RACM must be performed by a specialty licensed contractor (C-19) adhering to contract specification developed based on the results of the inspection and assessment, and EPA, OSHA and DOH regulations. Additionally, all ACM disturbed during the course of

demolition or renovation should be sampled and analyzed in accordance with the EPA and DOH regulation by a State certified inspector.

Affected areas suspected of lead-based paint (LBP) is a regulatory concern for abatement of workers per OSHA requirements and for disposal acceptance at municipal landfill facilities. Prior to the disturbance of the suspect LBP containing materials, the materials will be tested by the State of Hawai‘i verified LBP inspector using an EPA approved method. If paint chip samples are collected, the samples should be analyzed by a USNVLAP accredited laboratory, to be analyzed for lead content using EMC SOP Method #L01/1 and EPA SW-846 Method 7420. Furthermore, bulk samples of homogenous materials may be collected in accordance with DOH and EPA requirements. Alternatively, any or all LBP materials will be presumed to be LBP containing and handled as such by the UH.

A hazardous materials inventory and survey should be conducted in all areas occupied by tenant organizations scheduled for displacement or relocation. Any hazardous materials that may be identified prior to or during construction of the Proposed Action will be disposed properly.

3.12 Traffic

A Traffic Impact Report (TIR) was prepared by Wilson Okamoto Corporation in June 2020 (updated in August 2022) to identify and assess traffic impacts anticipated to result from the Proposed Action (See Appendix H-1). This report was updated between the Draft and Final EA to account for changes in the LRDP projects. A Transportation and Parking Management Plan (TPM) was also prepared by Wilson Okamoto Corporation in May 2022 to identify transportation and parking management strategies that can be implemented to mitigate potential impacts on the area roadway network surrounding the UHM campus from operation of the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project (See Appendix H-2). A TIR specific for the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion was prepared by Wilson Okamoto Corporation in August 2022 to identify and assess traffic impacts anticipated to results from UH Football events (See Appendix H-3). It should be noted that both the P3 projects underwent their own review (including Chapter 343, HRS), entitlement, and permitting processes, which also included their own TIRs that will be highlighted in this section.

The UHM campus is located adjacent to University Avenue to the west and the H-1 Freeway to the south. Primary access to the UHM campus is provided via driveways and access roadways off University Avenue, Dole Street, and Kalele Road (See Figure 3-16).

Existing Roadway Network

University Avenue is a predominately six-lane, two-way divided roadway generally oriented in the north-south direction that transitions to a predominately four-lane roadway south of the H-1 Freeway overpass. At the northwest corner of the UHM, University Avenue intersects with Maile Way. At this signalized intersection, the northbound approach of University Avenue has an exclusive left-turn lane, two through lanes, and an exclusive right-turn lane, while the southbound approach has an exclusive left-turn lane and a shared through and right-turn lane. Maile Way is a predominantly two-lane, two-way roadway generally oriented in the east and west direction that provides access through the Central and Upper Central Campus.

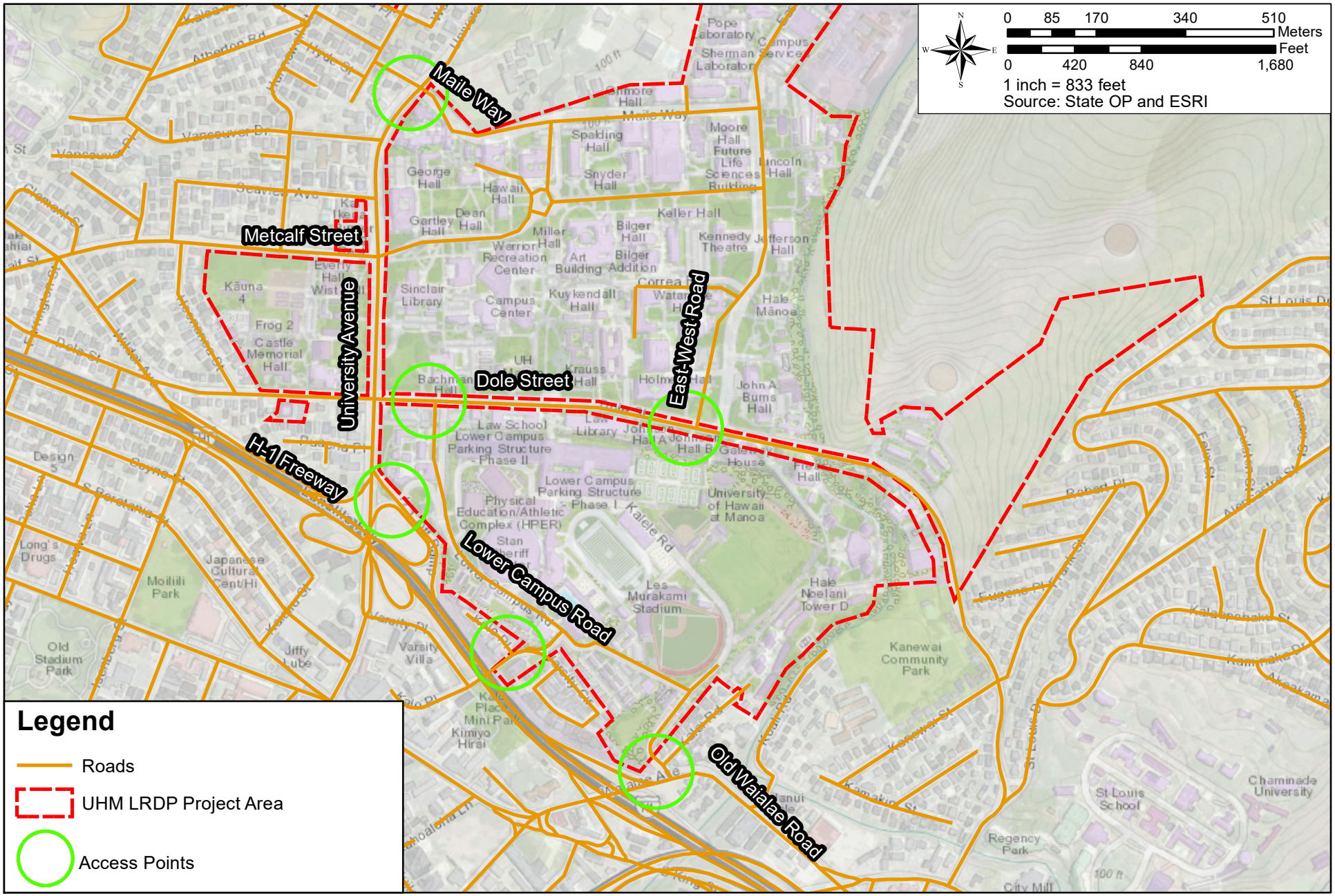


FIGURE 3-16

UHM ACCESS POINTS MAP

At the intersection with University Avenue, the eastbound approach has one wide lane that serves all traffic movement while the westbound approach has an exclusive left-turn lane, a through lane, and an exclusive right-turn lane. South of the intersection with Maile Way, University Avenue intersects a driveway for a parking lot between the School of Architecture and College of Business. At this unsignalized intersection, University Avenue is a divided roadway with turning movements from the driveway restricted to right-turn movements only. The northbound approach of this intersection has two through lanes and a shared through and right-turn lane.

South of the intersection with the driveway, University Avenue intersects Metcalf Street. At this signalized intersection, the northbound approach of University Avenue has an exclusive left-turn land and three through lanes, while the southbound approach has two through lanes and a shared through and right-turn lane. Metcalf Street is a predominantly two-lane, two-way roadway generally oriented in the east-west direction that serves as a connector roadway between University Avenue and McCully Street. At the intersection with University Avenue, the eastbound approach of Metcalf Street has exclusive turning lanes.

Further south, University Avenue intersects the northern connection of Sinclair Circle. At this unsignalized intersection, the northbound approach of University Avenue has two through lanes and a shared through and right-turn lane while the southbound approach has an exclusive left-turn lane and three through lanes. Sinclair Circle intersects University Avenue twice and provides access to an adjacent university parking lot and bus stop area. At the intersection with University Avenue, the Sinclair Circle approach has exclusive turning lanes.

At the southwest corner of the Central Campus, University Avenue intersects Dole Street. At this signalized intersection, the northbound approach of University Avenue has an exclusive left-turn lane, two through lanes, a shared through and right-turn lane, and an exclusive right-turn lane, while the southbound approach has an exclusive left-turn lane, two through lanes, and a shared through and right-turn lane. Dole Street is a two-way roadway generally oriented in the east-west direction that varies from two to four lanes. At the intersection with University Avenue, both approaches of Dole Avenue have a shared left-turn and through lane and a shared through and right-turn lane.

South of the intersection with Varsity Place, University Avenue intersects South King Street and South Beretania Street. At this signalized intersection, both approaches of University Avenue have exclusive turning lanes and two through lanes. South King Street and South Beretania Street are one-way roadways that form a couplet that provides east-west access through Honolulu. At the intersection with University Avenue, the eastbound approach of South King Street has two exclusive left-turn lanes, three through lanes, and an exclusive right-turn lane while the westbound approach has an exclusive left-turn lane, two through lanes, and a shared through and right-turn lane.

Wilder Avenue is a predominantly two-lane, two-way roadway that serves as a connector roadway between the H-1 Freeway and Metcalf Street. North of Metcalf Street, Wilder Avenue turn westward and continues through Makiki to its terminus west of Pensacola Street. At the signalized intersection with Metcalf Street, the northbound approach of Wilder Avenue has a shared left-turn and through lane and a shared through and right-turn lane. During the morning peak hours of 6:30 a.m. and 8:30 am on weekdays, left-turns are prohibited on northbound approach of Wilder Avenue. The eastbound approach of Metcalf Street has one lane that serves all traffic movements while the westbound approach has an exclusive right-turn lane and a through lane.

Southeast of the intersection with Metcalf Street, Wilder Avenue intersects Dole Street. At this unsignalized intersection, both approaches of Wilder Avenue have one channelized lane that serves all traffic movements. The eastbound approach of Dole Street has one stop-controlled lane that serves left-turn and through traffic movements while the westbound approach has one stop-controlled lane that serves through and right-turn traffic movements.

From the intersection with Wilder Avenue, Dole Street continues eastward past University Avenue and 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. At the intersection with Dole Street, the Lower Campus Road approach has exclusive turning lanes.

East of the intersection with Lower Campus Road, 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 Central and Upper Central Campus. 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.

Southeast 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 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.

For the 2020 TIR, 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 12 intersections:

- University Avenue and Maile Way
- University Avenue and University Driveway
- University Avenue and Metcalf Street
- University Avenue and Sinclair Circle
- University Avenue and Dole Street
- University Avenue and Varsity Place
- University Avenue, South King Street, and South Beretania Street
- Wilder Avenue and Metcalf Street
- Wilder Avenue and Dole Street
- Dole Street and Lower Campus Road
- Dole Street and East-West Road
- Dole Street and St. Louis Drive

Given the COVID-19 pandemic that resulted in significantly decreased traffic volumes and shifted travel patterns, no growth in traffic was assumed in the vicinity between Years 2019 and 2022. During this time period, the State of Hawai'i Department of Transportation (HDOT) tracked traffic volumes along major routes to provide a comparison of traffic volumes as result of the ongoing pandemic. Tracking information in the vicinity of the UHM campus indicated that traffic volumes during the final quarter of 2021 were still in the range of pre-COVID volumes. As such, the Year 2019 traffic data are assumed to be representative of baseline Year 2022 conditions.

The highway capacity analysis performed in the 2020 TIR (updated August 2022) is based upon procedures presented in the "Highway Capacity Manual", 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 2020 TIR study area. As such, for the purpose of the 2020 TIR, 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 weekday AM peak hour of traffic generally occurs between 7:00 a.m. and 8:00 a.m. while the weekday PM peak hour of traffic generally occurs between 3:00 p.m. and 4:00 p.m. Although the peak hours of traffic generally occur around the same periods at each of the study intersections, the absolute commuter peak hour time periods for each intersection may differ slightly. Absolute commuter peak hours can be defined as the period of time in which usage or traffic of the roadways is at its highest recorded volumes. The analysis is based on these absolute commuter peak hour time periods to identify the traffic impacts resulting from the Proposed Action.

For the 2022 Clarence T.C. Ching Athletic Complex Phase 2 Expansion TIR, field investigations were initially conducted on Saturday, April 30, 2022, which consisted of manual turning movement count surveys at key intersections in the vicinity of the project during the afternoon peak hours when the majority of attendees to football events are anticipated to arrive, between 4:30 PM and 6:30 PM at the following 7 intersections:

- University Avenue and Maile Way
- University Avenue and Metcalf Street
- University Avenue and Dole Street
- University Avenue, South King Street, and South Beretania Street
- Dole Street and Lower Campus Road
- Dole Street and East-West Road
- Dole Street and St. Louis Drive

It should be noted that there were events held within Lower Campus on the day of the field investigations, including a sold-out collegiate baseball game which started at about 6:30 PM. The April 2022 counts were supplemented with additional manual turning movement counts conducted during Saturday, July 2022, as well as Year 2019 screen line traffic data collected by the HDOT in the vicinity of the UHM campus.

The Saturday PM peak hour of traffic is expected to occur between 5:00 PM and 6:00 PM when football events are held at the Clarence T.C. Ching Athletic Complex with a start time of 6:00 PM. The analysis is based on this peak hour for each intersection to identify the traffic impacts resulting from the project. It should be noted that the baseline Saturday PM peak hour volumes were adjusted to account for the events held within Lower Campus on the day of the field investigations.

Pedestrian Facilities

Pedestrian facilities in the vicinity of the UHM campus are generally comprised of improved sidewalks, crosswalks, pedestrian signal phases, and curb ramps. Along the UHM frontage on University Avenue, Dole Street, and Maile Way, improved sidewalks are provided with crosswalks, curb ramps, and protected pedestrian signal phases at the study intersections to facilitate pedestrian crossings. In addition, street lighting and trees that provide intermittent shade enhance the overall pedestrian environment. Although some of the study intersections are widely-spaced with longer street blocks, marked crosswalks are provided at midblock locations to facilitate pedestrian crossings. Along Dole Street, the midblock crossing between Lower Campus Road and East-West Road is signalized, facilitating pedestrian connectivity between the Lower Campus parking garage and the pedestrian pathway referred to as the "Legacy Path" on Central Campus. In general, the environment in the immediate vicinity of the UHM is pedestrian-friendly; however existing gaps along the roadways further west of the UHM campus impact connectivity and convenient access for pedestrians. Although some pedestrian facilities such as sidewalks and street lighting are provided along Metcalf Street south of the UHM campus, those sidewalks terminate at the west end of the UHM campus requiring pedestrians to utilize a portion of the travel way beyond this point.

Within the UHM campus, a network of pedestrian facilities is provided including improved sidewalks and marked pedestrian crossings, with raised pedestrian crosswalks provided at select locations along Correa Road and Maile Way. Additional pedestrian facilities include the McCarthy Mall, a pedestrian pathway which extends between Varney Circle and East-West Road and the Legacy Path which extends between Campus Center and Dole Street.

Near the Clarence T.C. Ching Athletic Complex, primary pedestrian access is provided through the Zone 20 parking garage with connections to the athletic complex provided on the 1st and 3rd floor of the garage. The 1st floor of the parking garage will connect to a pedestrian safe zone that eliminates conflicts with vehicular traffic along Kalele Road, but pedestrians can also elect to use the pedestrian bridge connected to the 3rd floor. Secondary access is also provided via sidewalks along Lower Campus Road and Kalele Road although those connections are more indirect and not anticipated to be actively managed during events. Finally, pedestrian connections are provided to the adjacent UHM dormitories for students accessing Lower Campus with a marked crosswalk provided across Kalele Road between the Clarence T.C. Ching Athletic Complex and the Les Murakami Stadium.

Bicycle Facilities

Within the existing UHM campus, bicycle parking areas are provided at nearly 50 locations across campus with secured parking available for free at the Lower Campus Road parking garage. In addition, the UHM campus is served by a number of BIKI bikeshare stations with 2 bikeshare stations located along the McCarthy Mall and another station located along Maile Way. Two additional stations are also located within Lower Campus south of Dole Street. However, the existing bicycle facilities along the surrounding roadways are generally limited. Along University Avenue, a bike lane is provided on the west side of the roadway only with a climbing lane provided along the east side of the roadway between Varsity Place and Dole Street. There are also bike lanes provided along both sides of Metcalf Street between University Avenue and Wilder Avenue, as well as along a small segment of Dole Street between University Avenue and East-West Road. East of East-West Road, Dole Street transitions as a shared roadway with bicyclists sharing the roadway with vehicles.

In the vicinity of the Clarence T.C. Ching Athletics Complex, bike lanes are provided along portions of University Avenue and Dole Street facilitating connectivity to Lower Campus through the Zone 20 parking garage. Short-term bike parking areas are provided at various locations within Lower Campus with secured parking areas provided on the 1st floor of the Zone 20 parking garage and east of the Clarence T.C. Ching Athletics Complex in the vicinity of the dormitories. Connections to/from these parking areas are provided via pedestrian facilities within Lower Campus.

Transit Facilities

There is a dense network of existing transit resources located within the vicinity of the UHM campus. These facilities are provided by “The Bus” which is operated by the Oʻahu Transit Service (OTS) for the City and County of Honolulu Department of Transportation Services. Along the UHM campus frontage on University Avenue, Dole Street, and Maile Way, there are approximately 15 bus stops serving a total of 14 unique routes. Access to transit facilities in the vicinity are facilitated by improved sidewalks along the adjacent roadways and protected pedestrian crossings at the study intersections. In the vicinity of the Clarence T.C. Ching Athletics Complex, the closest bus stop along University Avenue is located at the intersection with Dole Street and the closest stop along Dole Street is located just past the signalized midblock along that roadway.

In addition, the UHM also provides a free shuttle service referred to as the “Rainbow Shuttle” which provides connections to various destinations within the university campus as well as to and from the neighboring vicinity as far as Mōʻiliʻili to the west and Koko Head Avenue to the east. 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. However, these routes are primarily daytime routes that would not provide additional transit connectivity during the UH Football events.

University Avenue and Maile Way

At the intersection with University Avenue and Maile Way, University Avenue carries 887 vehicles northbound and 542 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 963 vehicles traveling northbound and 543 vehicles traveling southbound. The northbound approach operates at Level of Service (LOS) LOS “B” and LOS “C” during the AM and PM peak periods, respectively, while the southbound approach operates at LOS “C” during both peak periods. Traffic queues periodically formed on the University Avenue

approaches of the intersection. Average queue lengths of 8-10 vehicles were observed at both approaches during both peak periods.

Maile Way carries 315 vehicles eastbound and 581 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are lower with 262 vehicles traveling eastbound and 573 vehicles traveling westbound. The eastbound and westbound approaches operate at LOS "C" during both peak periods. Field observation indicates that traffic operations at this intersection are influenced by vehicles accessing the adjacent Mid-Pacific Institute which utilizes Maile Way as an access point. Traffic queues periodically formed on both approaches of the intersection with the most significant queueing observed on the westbound approach. Average queue lengths of 9-10 vehicles were observed on the westbound approach during both peak periods.

Crosswalks are provided on all sides of the intersection. During the AM peak period, 10 pedestrians and 68 pedestrians were observed crossing University Avenue on the north and south sides of the intersection, respectively, while 9 pedestrians and 3 pedestrians were observed crossing Maile Way on the east and west sides of the intersection, respectively. During the PM peak period, 8 pedestrians and 100 pedestrians were observed crossing University Avenue on the north and south sides of the intersections, respectively, while 24 pedestrian and 2 pedestrians were observed crossing Maile Way on the east and west sides of the intersection, respectively.

At the intersection with University Avenue and Maile Way, University Avenue carries 467 vehicles northbound and 420 vehicles southbound during the Saturday PM peak period. The northbound approach operates at LOS "A" while the southbound approach operates at LOS "B" during the Saturday PM peak period. Maile Way carries 68 vehicles eastbound and 59 vehicles westbound during the Saturday PM peak period. The eastbound and westbound approaches operate at LOS "C" during this peak period.

Crosswalks are provided on all sides of the intersection. During the Saturday PM peak period, 2 pedestrians and 23 pedestrians were observed crossing University Avenue on the north and south sides of the intersection, respectively, while 8 pedestrians and 2 pedestrians were observed crossing Maile Way on the east and west sides of the intersection, respectively.

University Avenue and University Driveway

At the intersection with the University driveway, University Avenue carries 991 vehicles and 1,033 vehicles northbound during the AM and PM peak periods, respectively. The University driveway carries 31 vehicles westbound during the AM peak period and 71 vehicles westbound during the PM peak period. The westbound approach operates at LOS "B" during both peak periods. Minimal traffic queues were observed on the westbound approach with average queues of 1-2 vehicles observed during both peak periods.

University Avenue and Metcalf Street

At the intersection with Metcalf Street, University Avenue carries 1,005 vehicles northbound and 1,192 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are slightly lower with 968 northbound vehicles and 1,183 southbound vehicles. The northbound and southbound approaches operate at LOS "B" during both peak periods. Queues periodically formed on the northbound and southbound approaches of the intersection. Average queue lengths of 10-12 vehicles were observed on the northbound approach during the AM peak period with average queue lengths of 7-9 vehicles observed on the southbound approach during

the same peak period. During the PM peak period, average queue lengths of 5-7 vehicles were observed on the northbound approach while average queue lengths of 7-9 vehicles were observed on the southbound approach. Field observation indicates that traffic operations at this intersection are influenced by the nearby University Laboratory School as the traffic queues were primarily clustered around the start and end of the school day.

Metcalf Street carries 388 eastbound vehicles during the AM peak period and 425 vehicles during the PM peak period. The eastbound approach of Metcalf Street operates at LOS "C" both peak periods. Traffic queues occasionally formed on the Metcalf Street approach of the intersection with average queues of 2-3 vehicles observed during both peak periods. Field observation indicates traffic operations on the eastbound approach of Metcalf Street are influenced by the high volume of conflicting pedestrian crossings at this intersection.

Pedestrian crossings are provided on all sides of the intersection. During the AM peak period, 17 pedestrians and 146 pedestrians were observed crossing University Avenue on the north and south sides of the intersection, respectively, while 23 pedestrians were observed crossing Metcalf Street at the west side of the intersection. During the PM peak period, 70 pedestrians and 148 pedestrians were observed crossing University Avenue on the north and south sides of the intersection, respectively, while 65 pedestrians were observed crossing Metcalf Street on the west side of the intersection.

At the intersection with Metcalf Street, University Avenue carries 492 vehicles northbound and 517 vehicles southbound during the Saturday PM peak period. Both approaches operate at LOS "A" during the Saturday PM peak period. Metcalf Street carries 102 eastbound vehicles and operates at LOS "B" during the same peak period.

Pedestrian crossings are provided on all sides of the intersection. During the Saturday PM peak period, 6 pedestrians and 5 pedestrians were observed crossing University Avenue on the north and south sides of the intersection, respectively, while 14 pedestrians were observed crossing Metcalf Street at the west side of the intersection.

University Avenue and Sinclair Circle

At the intersection with Sinclair Circle, University Avenue carries 1,092 vehicles northbound and 1,355 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are slightly lower with 1,033 vehicles traveling northbound and 1,315 vehicles traveling southbound. The southbound left-turn movement along University Avenue operates at operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively.

Sinclair Circle carries 44 vehicles westbound during the AM peak period and 60 vehicles during the PM peak period. The westbound approach operates at LOS "A" and LOS "C" during the AM and PM peak periods, respectively. Minimal traffic queues were observed on the westbound approach of the intersection with average queue lengths of 1-2 vehicles observed during both peak periods.

Pedestrian crossings are provided across University Avenue on the north side of the intersection as well as across the Sinclair Circle approach of the intersection on the east side of the intersection. During the AM peak period, 16 pedestrians were observed crossing University Avenue on the north side of the intersection while 8 pedestrians were observed crossing the Sinclair Circle approach on the east side of the intersection. During the PM peak period, 14

pedestrians were observed crossing University Avenue on the north side of the intersection with 11 pedestrians crossing the Sinclair Circle approach on the east side of the intersection.

University Avenue and Dole Street

At the intersection with Dole Street, University Avenue carries 1,706 northbound vehicles and 1,408 southbound vehicles during the AM peak period. During the PM peak period, the traffic volumes are lower with 1,507 vehicles traveling northbound and 1,291 vehicles traveling southbound. The northbound and southbound approaches of University Avenue operate at LOS "D" during both peak periods. Traffic queues periodically formed on the University Avenue approaches of the intersection during both peak periods. Average queue lengths of 12-14 vehicles were observed at both approaches during the AM peak period while average queue lengths of 10-12 vehicles were observed during the PM peak period.

Dole Street carries 499 eastbound vehicles and 666 westbound vehicles during the AM peak period. During the PM peak period, the traffic volumes are higher with 525 vehicles traveling eastbound and 700 vehicles traveling westbound. The eastbound and westbound approaches operates at LOS "E" during both peak periods. Traffic queues periodically formed on both 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 during this peak period, while average queue lengths of 10-12 vehicles were observed on the westbound approach during the same peak period. Field observation indicates that the high volume of traffic along University Avenue, as well as the split phasing of the eastbound and westbound approaches contribute to the queueing and delays at this intersection with westbound queues occasionally extending to the upstream intersection with Lower Campus Road.

Pedestrian crossings are provided on all sides of the intersection. During the AM peak period, 39 pedestrians and 21 pedestrians were observed crossing University Avenue on the north and south sides of the intersection, respectively, while 14 pedestrians and 22 pedestrians were observed crossing Dole Street on the east and west sides of the intersection, respectively. During the PM peak period, 41 pedestrians and 53 pedestrians were observed crossing University Avenue on the north and south sides of the intersection, respectively, while 26 pedestrians and 41 pedestrians were observed crossing Dole Street on the east and west sides of the intersection, respectively.

At the intersection with Dole Street, University Avenue carries 654 northbound vehicles and 546 southbound vehicles during the Saturday PM peak period. Both approaches operate at LOS "C" during this peak period. Dole Street carries 202 vehicles eastbound and 242 vehicles westbound with both approaches operating at LOS "C" during the Saturday PM peak period.

Pedestrian crossings are provided on all sides of the intersection. During the Saturday PM peak period, 5 pedestrians and 13 pedestrians were observed crossing University Avenue on the north and south sides of the intersection, respectively, while 14 pedestrians and 14 pedestrians were observed crossing Dole Street on the east and west sides of the intersection, respectively.

University Avenue and Varsity Place

At the intersection with Varsity Place, University Avenue carries 1,459 vehicles northbound and 741 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are lower with 1,052 vehicles traveling northbound and 752 vehicles traveling southbound. The northbound and southbound approaches operate at LOS "A" during the AM and PM peak periods.

Traffic queues occasionally formed on the University Avenue approaches of the intersection with the most significant queueing observed on the northbound approach. Average queues lengths of 5-7 vehicles were observed on that approach during the AM peak period with average queue lengths of 3-5 vehicles observed on the same approach during the PM peak period.

Varsity Place carries 124 vehicles westbound during the AM peak period and 201 vehicles during the PM peak period. The westbound approach operates at LOS "C" and LOS "B" during the AM and PM peak periods, respectively. Traffic queues occasionally formed on the Varsity Place approach of the intersection. Average queue lengths of 1-2 vehicles were observed during the AM peak period with average queue lengths of 2-3 vehicles observed during the PM peak period. Pedestrian crossings are provided across University Avenue on the north side of the intersection as well as across Varsity Place on the east side of the intersection. During the AM peak period, 19 pedestrians were observed crossing University Avenue on the north side of the intersection while 26 pedestrians were observed crossing Varsity Place on the east side of the intersection. During the PM peak period, 13 pedestrians were observed crossing University Avenue on the north side of the intersection while 52 pedestrians were observed crossing Varsity Place on the east side of the intersection.

University Avenue, South King Street, and South Beretania Street

At the intersection with South King Street and South Beretania Street, University Avenue carries 771 vehicles northbound and 839 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is slightly higher with 668 vehicles traveling northbound and 987 vehicles traveling southbound. The northbound approach operates at LOS "E" during both peak periods, while the southbound approach operates at LOS "E" and LOS "D" during the AM and PM peak periods, respectively. Traffic queues periodically formed on the University Avenue approaches of the intersection with the most significant queueing observed on the northbound approach. Traffic queues on the northbound approach of University Avenue periodically extended through the upstream intersection with Kuilei Street during both peak periods.

South King Street carries 1,494 vehicles eastbound and 1,443 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is approximately the same with 2,081 vehicles traveling eastbound and 900 vehicles traveling westbound. The eastbound and westbound approaches operate at LOS "D" during both peak periods. Traffic queues periodically formed on the South King Street approaches of the intersection. During the AM peak period, traffic queues on the westbound approach periodically extended through the upstream intersection with Kahuna Lane, while average queue lengths of 6-8 vehicles were observed on the eastbound approach during the same peak period. During the PM peak period, average queue lengths of 5-7 vehicles were observed on the westbound approach with average queue lengths of 10-12 vehicles on the eastbound approach during the same peak period.

Pedestrian crossings are provided on all sides of the intersection. During the AM peak period, 52 pedestrians and 49 pedestrians were observed crossing University Avenue on the north and south sides of the intersection, respectively, while 56 pedestrians and 52 pedestrians were observed crossing South King Street and South Beretania Street on the east and west sides of the intersection, respectively. During the PM peak period, 114 pedestrians and 127 pedestrians were observed crossing University Avenue on the north and south sides of the intersection, respectively, while 150 pedestrians and 69 pedestrians were observed crossing South King Street and South Beretania Street on the east and west sides of the intersection, respectively.

At the intersection with S. King Street and S. Beretania Street, University Avenue carries 485 vehicles northbound and 500 vehicles southbound during the Saturday PM peak period. The northbound approach operates at LOS "D" while the southbound approach operates at LOS "C" during this peak period. The S. King Street approach of the intersection carries 1,053 vehicles eastbound and 550 vehicles westbound during the Saturday PM peak period. Both the eastbound and westbound approaches operate at LOS "C" during the same peak period.

Pedestrian crossings are provided on all sides of the intersection. During the Saturday PM peak period, 45 pedestrians and 63 pedestrians were observed crossing University Avenue on the north and south sides of the intersection, respectively, while 48 pedestrians and 29 pedestrians were observed crossing S. King Street and S. Beretania Street on the east and west sides of the intersection, respectively.

Wilder Avenue and Metcalf Street

At the intersection with Metcalf Street, Wilder Avenue carries 653 vehicles northbound and 670 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 771 vehicles traveling northbound and 735 vehicles traveling southbound. The northbound approach operates at LOS "C" and LOS "B" during the AM and PM peak periods, respectively, while the southbound approach operates at LOS "B" and LOS "A" during the AM and PM peak periods, respectively. Traffic queues occasionally formed on the northbound and southbound approaches of the intersection. Average queue lengths of 8-10 vehicles were observed on the northbound approach while average queue lengths of 5-7 vehicles were observed on the southbound approach during both peak periods.

Metcalf Street carries 101 vehicles eastbound and 513 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 169 vehicles traveling eastbound and 400 vehicles traveling westbound. The eastbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively, while the westbound approach operates at LOS "C" during both peak periods. Traffic queues occasionally formed on the Metcalf Street approaches of the intersection with the most significant queueing observed on the westbound approach. During the AM peak period, average queue lengths of 8-10 vehicles were observed on the westbound approach while average queue lengths of 5-7 vehicles were observed at the same approach during the PM period.

Pedestrian crossings are provided on all sides of the intersection. During the AM peak period 18 pedestrians and 10 pedestrians were observed crossing Metcalf Street on the east and west sides of the intersection, respectively, while 17 pedestrians and 13 pedestrians were observed crossing Wilder Avenue on the north and south sides of the intersection, respectively. During the PM peak period, 7 pedestrians and 6 pedestrians were observed crossing Metcalf Street on the east and west sides of the intersection, respectively, while 14 pedestrians were observed crossing Wilder Avenue at both the north and south sides of the intersection.

Wilder Avenue and Dole Street

At the intersection with Wilder Avenue, Dole Street carries 23 vehicles eastbound and 166 vehicles westbound during the AM peak period. During the PM peak period overall traffic volumes are slightly higher with 15 vehicles traveling eastbound and 161 vehicles traveling westbound. The eastbound approach operates at LOS "E" and LOS "F" during the AM and PM peak periods, respectively, while the westbound approach operates at LOS "D" during both peak periods. Field

observation indicates that the traffic operations at this two-way stop-controlled intersection are influenced by the relatively high volume of traffic along Wilder Avenue thereby providing limited gaps in the traffic stream for vehicles on the side streets. Minimal traffic queues were observed on the Dole Street approaches of the intersection with average queue lengths of 1-2 vehicles were observed on both approaches during the AM and PM peak periods.

Wilder Avenue carries 678 vehicles northbound and 331 vehicles southbound during the AM peak period at this intersection. During the PM peak period traffic volumes are higher with 767 vehicles traveling northbound and 421 vehicles traveling southbound. Traffic queues occasionally formed on the southbound approach of Wilder Avenue. Average queue lengths of 1-2 vehicles were observed during the AM peak period with average queue lengths of 3-4 vehicles observed during the PM peak period. The southbound approach operates at LOS "A" during both peak periods.

Pedestrian crossings are provided across Wilder Avenue on north and south sides of the intersection, as well as across Dole Street on the east side of the intersection. During the AM peak period, 6 pedestrians and 9 were observed crossing the south side of the intersection, respectively while 18 pedestrian was observed crossing Dole Street on the east side of the intersection. During the PM peak period, 6 pedestrians and 9 pedestrians were observed crossing Wilder Avenue on the north and south sides of the intersection, respectively, while 2 pedestrians were observed crossing Dole Street on the east side of the intersection.

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. As previously discussed, 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 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.

At the intersection with Lower Campus Road, Dole Street carries 362 vehicles eastbound and 237 vehicles westbound during the Saturday PM peak period. The eastbound and westbound approaches of Dole Street operate at LOS "A" during this peak period. Lower Campus Road carries 25 vehicles northbound and operates at LOS "B" during the same peak period. As previously discussed, there were a number of other events held within Lower Campus on the day of field investigations including a sold-out baseball game and as such, the baseline data at this intersection was adjusted to account for these events.

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 Saturday PM peak period, no pedestrians were observed crossing Dole Street on the east and west side of the intersection, while 4 pedestrians were observed crossing the Lower Campus Road on the south side of the intersection.

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.

At the intersection with East-West Road, Dole Street carries 285 vehicles eastbound and 164 vehicles westbound during the Saturday PM peak period. The eastbound and westbound approaches operate at LOS "A" during the Saturday PM peak period. East-West Road carries 155 vehicles southbound and operates at LOS "A" during the same 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 Saturday PM peak period, 8 pedestrians and 5 pedestrians were observed crossing on the east and west sides of the intersection, respectively, while 3 pedestrians were observed crossing East-West Road on the north side of the intersection.

Dole Street and St. Louis Drive

At the intersection with St. Louis Drive, Dole Street carries 535 vehicles eastbound during the 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. Field observation indicates that the low levels of service at this intersection are influenced by high volume of conflicting traffic at this intersection. Traffic queues occasionally formed on the eastbound approach of the intersection with average queue lengths of 6-8 vehicles observed during both peak periods.

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 queueing 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.

At the intersection with St. Louis Drive, Dole Street carries 296 vehicles eastbound and operates at LOS “B” during the Saturday PM peak period. St. Louis Drive carries 367 vehicles northbound and 243 vehicles southbound during the same peak period. The northbound left-turn movement on St. Louis Drive operates at LOS “A” during this 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. Minimal pedestrians were observed crossing at this intersection during the Saturday PM peak period with no pedestrians observed crossing Dole Street on the west side of the intersection and 1 pedestrian was observed crossing St. Louis Drive on the south side of the intersection.

Clarence T.C. Ching Athletic Complex Events

Since 2021-2022 NCAA Football season, the UH Football program has been hosting home football games at the Clarence T.C. Ching Athletic Complex. Currently, Clarence T.C. Ching Athletic Complex allows for approximately 10,000 spectators under an approved PRU Minor Modification Permit (2021/MOD-72(GT)). The UHM does not hold any other events during these events due to conditions of approval for the PRU Minor Modification Permit.

All UH Football home games are held on Saturday nights typically starting at 6:00 PM. No games are held on the weekday with the exception of the Hawai‘i Bowl which is held on December 24th when schools are not in session. Typically, primary parking for events on campus is located in the Lower Campus parking garage (referred to as “Zone 20”) which has approximately 2,810

stalls. Parking for UH Football games open 3 hours prior to the start of events with tailgating by attendees prohibited. Without the attraction of pre-game tailgating events, event attendees are expected to time their arrivals based on the amount of delay they expect to encounter accessing allocated parking areas. As such, most attendees generally arrive within 1-2 hours of the start of the event. After the event, most attendees generally departed within an hour of the end of the event as indicated by historical data from events held within Lower Campus.

UHM currently has a total of approximately 5,000 parking stalls throughout its Upper Central, Central, and Lower Campus, but not all of these parking areas can be opened up for public parking associated with these types of events. Parking management strategies for events held at the Clarence T.C. Ching Athletics Complex incorporate several of Transportation Demand Management (TDM) measures such as the provision of multiple parking options, differential pricing, and prepayment of parking fees.

UHM Parking Resources & Management

The UHM has the following parking resources at their disposal and used them accordingly for UH Football games at the Clarence T.C. Ching Athletic Complex (See Figure 3-17).

- **Zone 20 (Lower Campus Public Parking Area)**
  - The Lower Campus parking garage, Zone 20, provides the largest pool of on-site parking at UHM. Historical data indicates that this zone could accommodate up to 2,700 vehicles during events. However, this maximum capacity is dependent on the amount of residual and state/service vehicles present in the garage prior to event parking. Residual parking could result from daily parking passes or parking permits issued to students, faculty, and staff for this zone. As such, consideration should be given to setting a consistent number of available parking stalls for this zone that is less than 2,700 to allow for fluctuations in the number of available parking stalls. In addition, daily parking should not be allowed on game days and parking permits issued for this zone should be relocated to ensure a higher number of stalls for event parking. For the Fall 2021 season, UHM utilized the following parking management strategies for Zone 20:
    - Number of available parking stalls in Zone 20 was limited to 2,500 stalls
    - All faculty and staff parking permit holders were relocated from Zone 20 to Zones 4E and 5A on the north end of the Upper Central Campus.
    - All student permit parking holders were relocated from Zone 20 to Zones 7 and 9D
    - Daily parking passes for general parking within Zone 20 were not allowed on game days
    - Event parking opened 3 hours prior to the event (around 3:00 PM for a 6:00 PM event)
  - These management strategies will continue to be implemented by UHM for future events at the expanded Clarence T.C. Ching Athletic Complex. Access to Zone 20 is provided via Lower Campus Road (Access 4) or Kalele Road (Access 6).

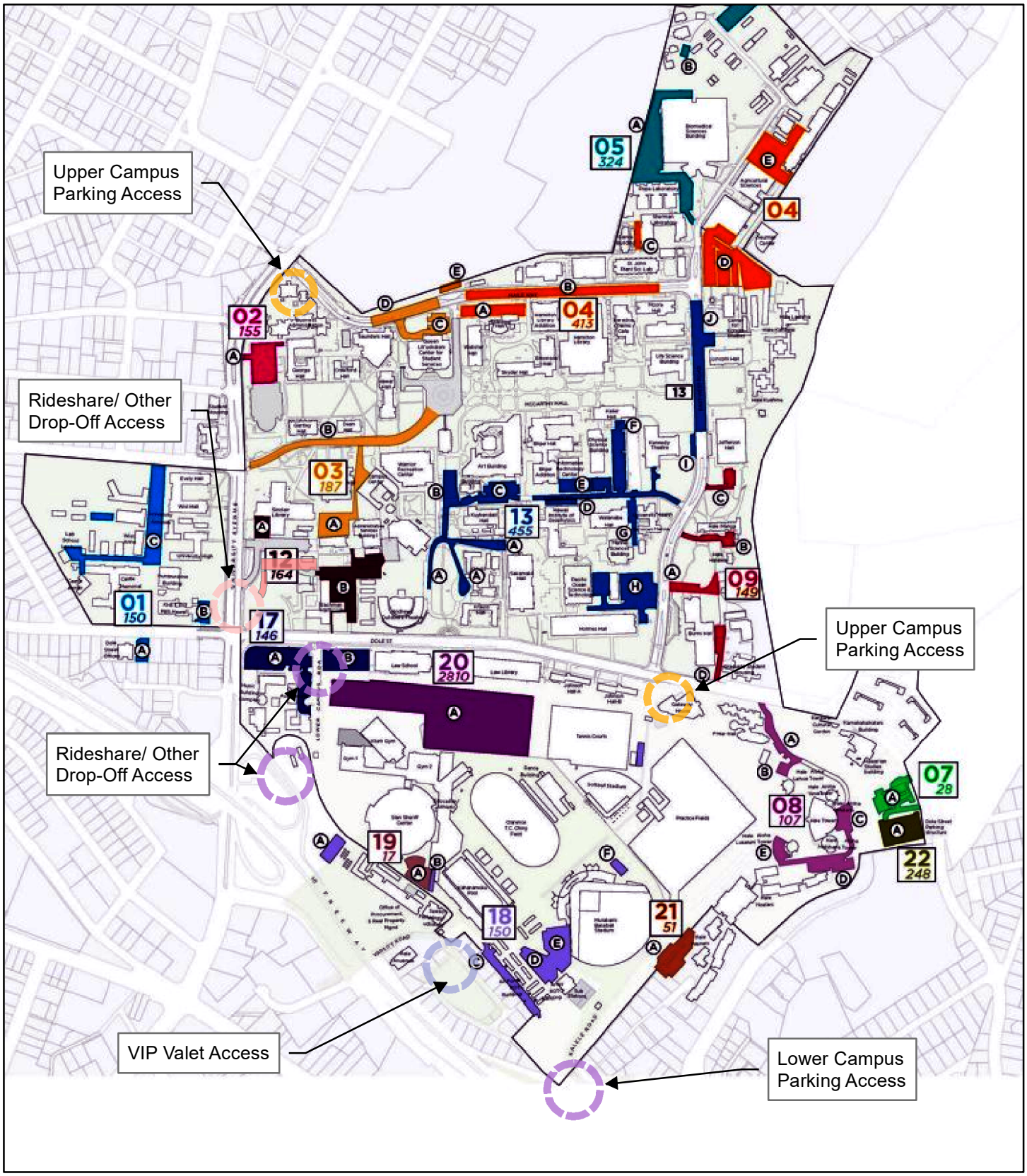


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FIGURE 3-17

UHM PARKING RESOURCES MAP

- **Zone 18C, 18D, and 18E (Reserved VIP Valet Parking Area)**
  During the Fall 2021 season, portions of Zone 18 near the Les Murakami stadium and existing ROTC buildings was designated as a reserved VIP parking area with access provided via the Varsity Gate (Access 5). UHM will continue to designate Zones 18C (ROTC Makai), 18D (ROTC Mauka), and 18E (HELP) as reserved for VIP parking but intends to utilize valet parking services for vehicles accessing this parking area. The use of valet operations for this zone will allow for more efficient parking within the parking area to maximize the use of the zone. The Varsity Gate will be actively managed by UHM staff to ensure that only authorized vehicles are allowed through this access point.

- **Zones 17,19,18F, and Other Areas (Reserved Lower Campus Parking Areas)**
  - During the Fall 2021 season, Zones 17, 19, and 18F (LMS Softball) as well as several small areas adjacent to Klum Gym and the practice fields were designated as reserved parking on event days for event support staff including administrative staff, coaches, referees, volunteers, band members, sports team members, sports team support staff, and HPD. UHM will continue to designate these zones as reserved parking areas for event support staff for future events at the expanded Clarence T.C. Ching Athletic Complex. Zone 17 is accessed via Lower Campus Road off Dole Street while the remaining zones can be accessed via the Varsity Gate or Kalele Road. Authorized vehicles accessing these parking areas are expected to arrive earlier and depart later than attendees for events at the Clarence T.C. Ching Athletic Complex. As such, minimal overlap and/or conflict is expected between vehicles accessing these reserved areas and the designated public and VIP parking areas.

- **Zone 4E and Zone 5A (Faculty and Staff Permit Parking Areas)**
  - Zones 4 and 5 were used for overflow parking during events prior to the start of the Fall 2021 football season. During the Fall 2021 season, UHM instead designated portions of these parking areas as the parking location for all faculty and staff permit holders on event days since parking in all other zones was prohibited on those days. Zones 4E (Agricultural Sciences) and 5A (Biomed) have the capacity to accommodate up to 283 vehicles. As previously mentioned, UHM will continue to designate these parking areas for faculty and staff permit holders on event days for future events at the expanded Clarence T.C. Ching Athletic Complex.

- **Zone 7 and Zone 9D (Student Permit Parking Areas)**
  - During the Fall 2021 season, UHM designated Zone 7 (Hawaiian Studies) and Zone 9D (NOAA) as the relocated parking area for students with Zone 20 parking permits on event days. UHM will continue to designate these parking areas for student permit holders on event days for future events at the expanded Clarence T.C. Ching Athletic Complex.

- **Zones 2, 3, 4, 9, and 13, (Upper Campus Public Parking Areas)**
  - During the Fall 2021 season, all permit and visitor parking areas in the following zones were designated for event public parking on game days:
    - Zone 2 (Architecture)

        - Zone 3A (Admin Services), 3B (Campus Road Sinclair), 3C (QLC), 3D (Maile Way Kiosk)
        - Zone 4A (Webster), 4B (Maile Way Farrington), 4C (Dance)
        - Zone 9A (Burns), 9B (Manoa), 9C (Jefferson)
        - Zone 13 (Krauss/Andrews/Kuy, Campus Center, Art, Correa Rd Campus, ITC, Kennedy, Health Services, POST, East West Road, Lincoln Hall)
    - These zones have the capacity to accommodate up to 1,000 vehicles if managed appropriately during before and after event periods. UHM will continue to designate these parking areas for public parking on event days for future events at the expanded Clarence T.C. Ching Athletic Complex. Parking within these areas will only open 3 hours prior to the start of the event with access provided via East-West Road (Access 1) or Maile Way (Access 3) with the exception of Zone 2 which is accessed directly off University Avenue. Parking areas accessed off East-West Road and Maile Way will be actively managed by UHM staff to ensure safe and efficient parking prior to and following the event. These zones are approximately 0.5 mile away from the Clarence T.C. Ching Athletics Complex which is equivalent to an approximate 10–12-minute walk.

- **Zones 1 and 12 (Reserved Upper Campus Parking Areas)**
    - During the Fall 2021 season, Zones 1 and 12 were reserved on event days for event support staff including administrative staff, coaches, referees, volunteers, band members, sports team members, sports team support staff, and HPD. UHM will continue to designate these zones as reserved parking areas for event support staff for future events at the expanded Clarence T.C. Ching Athletic Complex. It should be noted that there is a visitor parking lot within Zone 12 that will be designated as a waiting area for rideshare and other pick-up/drop-off activities with active passenger loading also allowed within Sinclair Circle near the existing bus stop. Zone 1 is be accessed off Metcalf Street and Dole Street while Zone 12 is accessed off University Avenue

Prior to the Fall NCAA Football 2021 season, when parking for an event at UHM exceeded the capacity, vehicles were turned away and had to either chose not to attend the event or were forced to find off-site parking on their own. However, as previously mentioned, the UHM has a dense network of existing transit resources located within the vicinity that can be utilized. Moreover, due to the limited parking capacity on-site, attendees may elect to use ride share (i.e., Uber or Lyft) or be dropped-off/picked-up from events. There is an existing bus pull out located along University Avenue at Sinclair Circle with a relatively long length of curb. During the NCAA Fall 2021 season, this location was designated as the rideshare and other pick-up and drop-off area. Vehicles accessing this area entered off University Avenue via Access 2 and exited on the north end of the pull out with exiting maneuvers restricted to right-turn movements only. UHM will continue to designate this area as the rideshare and other pick-up and drop-off area for future events at the expanded Clarence T.C. Ching Athletic Complex.

There is an additional passenger loading area within Lower Campus near the Clarence T.C. Ching Athletics Complex to accommodate Kupuna (or elderly) attendees as well as any other attendees requiring an accessible pick-up and drop-off location. This Kupuna loading area is located along Lower Campus Road near Zone 19. Vehicles utilizing this area would enter via Access 4, travel along Lower Campus Road to the passenger loading area, then exit through the Varsity gate (Access 5). Parking within this area will be prohibited with only active loading and unloading

operations allowed. From this Kupuna loading area, attendees have a direct, accessible route to the Clarence T.C. Ching Athletic Complex.

Event Traffic Management

The UHM currently implements traffic management strategies for UHM events. These strategies include the following:

- **Entering Traffic Management**
  - Provision of a 3rd entering lane starting near the access for the Zone 17 parking area. In conjunction with this, the number of exiting lanes is reduced from two to one.
  - Provision of two left-turn lanes from Lower Campus Road to Kalele Road.
  - Conversion of Kalele Road from Lower Campus Road to the Zone 20 garage to two entering lanes. No exiting should be allowed to Lower Campus Road.
  - Restriction of traffic along Lower Campus Road south of Kalele Road to authorized vehicles only. Consideration should be given to stationing personnel on either end to direct traffic and enforce the vehicular restriction.
  - Designation of the diamond head (DH) garage access near Clarence T.C. Ching Athletic Complex for exiting traffic only.
- **Exiting Traffic Management**
  - Conversion of Kalele Road from the garage to Lower Campus Road to two exiting lanes. No entering should be allowed from Lower Campus Road.
  - Provision of two right-turn lanes from Kalele Road to Lower Campus Road.
  - Conversion of the southbound left-turn lane along Lower Campus Road to an exiting lane at the intersection with Kalele Road.
  - Provision of two left-turns on the Lower Campus Road approach of the intersection with Dole Street. In conjunction with this lane use modification, westbound left-turn traffic movements should be prohibited from Dole Street into Lower Campus Road.
  - Modification of the lane use on the Lower Campus Road approach of the Dole Street intersection to facilitate double left-turn traffic movements.
  - Provision of a direct connection to Dole Street from the parking garage via the 5 th floor garage connection to the Zone 17 parking area (near the Law building) to provide an additional outlet for exiting vehicles from the parking garage.
  - Conversion of Kalele Road from the Zone 20 garage to Waialae Avenue to two exiting lanes. No entering should be allowed to Kalele Road.
  - Provision of two exiting lanes out of the DH access for the parking garage.

- Provision of Special Duty Officers (SDOs) at the intersection of Lower Campus Road and Dole Street to facilitate exiting traffic and pedestrian crossing of Dole Street.

- Provision of Special Duty Officers (SDOs) at the intersection of University Avenue and Dole Street to facilitate westbound traffic along Dole Street.

- **Clarence T.C. Ching Athletic Complex Access and Circulation**
  - In conjunction with the improvements made to the Clarence T.C. Ching Athletics Complex to increase capacity for the Fall 2021 season, access modifications were also implemented that resulted in a total of 10 access points for the facility. Main access for the public to the facility will be provided via an existing access along the north side of the stadium (Gate 1), improved accesses near the southwest corner of the stadium (Gates 2 and 3), and a gate near the southeast corner of the stadium (Gate 5), and a gate along the east side of the stadium (Gate 7). There are 5 additional limited access gates located around the field providing secondary access. Gate 1A near the northwest corner of the stadium is restricted to pass holders only, Gate 4 near the southwest corner is designated as the UH team access, Gate 5A near the southeast corner is restricted to suite guests, Gate 6 on the east side is designated as the visiting team access, and Gate 8 near the northeast corner of the stadium is restricted to broadcast TV staff. Internal circulation within the stadium around the field and between the provided public access points will be maintained through the use of a portion of the existing track or designated pedestrian paths (See Figure 19 from Appendix H-2).

Impacts and Mitigation Measures

The trip generation methodology used in the 2020 TIR is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 10th 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. 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. The UHM campus is served by established bus routes that may be accessed via pedestrian facilities in the vicinity. It should be noted the UHM's "U-Pass" program provides unlimited free bus fare for all regular day students during the Fall and Spring semesters. In addition, the UHM also offers a free shuttle service with routes between the campus and nearby neighboring destinations including Makiki to the west and Koko Head Avenue to the east. As such, the trips generated by the Proposed Action were adjusted to account for the use of alternate modes of transportation. The modal split for trips generated by the Proposed Action was based on the results of a transportation survey included in the Campus Transportation Demand Management Plan (2012) prepared for UHM.

With regards to the P3 Projects, they underwent their own review (including Chapter 343, HRS), entitlement, and permitting processes, which also included their own TIRs. With regards to the Mixed-Use Housing Project P3 Project, based upon the "*Traffic Impact Report for the University of Hawaii Multifamily Housing*" dated June 2020, the project is

expected to generate 45 trips during the AM peak period and 46 trips during the PM peak period. Access to the project site is expected to be provided via driveways off Dole Street and East-West Road with project completion anticipated by Year 2025. As such, the trips associated with the Mixed-Use Housing Project P3 Project was incorporated into the projected Year 2029 conditions of 2020 TIR for the Proposed Action. With regards to the Innovation Center P3 Project, based on the "*Traffic Impact Report for the Atherton Mixed-Use Student Housing Innovation and Entrepreneurship Center*" dated February 2020, the project is expected to generate 24 trips during the AM peak period and 41 trips during the PM peak period. Access to the project site 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 the 2020 TIR, the trips associated with the Innovation Center P3 was incorporated into the projected Year 2024 conditions.

Roadway Network

The Proposed Action is expected to be implemented over the next ten years. With the exception of the Central Traffic Center and the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project, the Proposed Action generally entails the replacement, modernization, and or consolidation of existing facilities to serve similar uses. As such, the anticipated increases in traffic along the surrounding roadways as result of these improvements are expected to primarily be a result of increases in student enrollment at the UHM rather than directly from the Proposed Action. Based on the information provided by UHM, it is anticipated that enrollment will remain static with very little increase or decrease. Access to the UHM campus is expected to continue being provided via driveways and access roadways off University Avenue, Dole Street, and Kalele Road. The directional distribution of all site-generated vehicles was based upon the relative distribution of traffic between the surrounding roadways. As such, 20% of trips were assumed to be traveling to/from the east via Dole Street and 15% of trips were assumed to be traveling to/from the west via Metcalf Street, while 15% and 50% of trips were assumed to be traveling to/from the north and south, respectively, via University Avenue during both peak periods. Site-generated trips were routed to and from the UHM campus based on their assumed origin/destination and relative convenience of the available routes.

The travel forecast is based upon historical traffic count data obtained from the State HDOT, Highways Division at survey stations located along University Avenue in the vicinity of the UHM campus. The historical data indicates relatively stable traffic volumes along the roadways in the vicinity. Typically, an annual growth rate of 1-2% is conservatively assumed for developments with relatively short horizon years when historical data indicates relatively stable growth along the adjacent roadways. However, given the long horizon year for the implementation of the improvements include in the LRDP and to account for the variations in traffic growth averaged over time, an annual traffic growth rate of approximately 0.5% was conservatively assumed in the vicinity. Using 2019 as the Base Year, a growth rate factor of 1.025 and 1.05 was applied to the existing through traffic demands along University Avenue to achieve the projected Year 2024 and Year 2029, traffic demands, respectively.

The proposed Central Traffic Center is expected to generate new trips. Typically, parking garages are not directly linked to the generation of new trips. Rather, trip generation is related to the generation characteristics of the associated land uses. However, based

upon the information included in the grant application prepared by UHM for the Central Traffic Center, there is a latent demand for parking in the project vicinity as there are currently only 5,700 parking stalls for approximately 24,000 students and faculty with some students utilizing adjacent roadways as alternate parking locations. At the time of the 2020, TIR, the new Central Traffic Center was expected to provide an additional 1,000 parking stalls (it has since been updated to include approximately 1,500 parking stalls; will be included in updated TIR) to meet this underserved demand, thereby generating new external trips in the project vicinity. It should be noted that although some of these trips may be a redistribution of vehicles that are currently parking in alternate locations in the surrounding neighborhoods, it was conservatively assumed that trips were new to the project vicinity. The UHM expects the new parking garage to be managed similar to the existing parking structure located on Lower Campus Road and as such, the trip generation characteristics for the proposed Central Traffic Center are expected to be similar to the Lower Campus parking garage. Using the expected number of parking stalls as the independent variable, a site-specific trip generation rate was determined for the proposed Central Traffic Center based on data collected at the primary access on Lower Campus Road. Table 3-10 below summarizes the trip generation characteristics related to the Central Traffic Center applied to the weekday commuter AM and PM peak hours of traffic.

Table 3-10: Peak Hour Trip Generation for the Central Traffic Center & Parking Garage

CENTRAL TRAFFIC CENTER & PARKING GARAGE		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	231
	EXIT	39
	TOTAL	270
PM PEAK	ENTER	199
	EXIT	266
	TOTAL	465

* *INDEPENDENT VARIABLE: # of parking stalls = 1,500*

The projected Year 2025 AM and PM peak period traffic volumes without the implementation of the Proposed Action are summarized in Table 3-11 below.

Table 3-11: Existing and Projected Year 2025 (Without Project) LOS Traffic Operating Conditions

Intersection	Approach	AM		PM	
		Exist	Year 2025 w/o Proj	Exist	Year 2025 w/o Proj
University Ave/ Maile Way	Eastbound	C	C	C	C
	Westbound	C	C	C	C

Intersection	Approach	AM		PM	
		Exist	Year 2025 w/o Proj	Exist	Year 2025 w/o Proj
	Northbound	B	B	B	B
	Southbound	C	C	C	C
University Ave/ University Dwy	Westbound	A	A	A	A
University Ave/ Metcalf St	Eastbound	C	C	C	C
	Northbound	B	B	B	B
	Southbound	B	C	B	B
University Ave/ Sinclair Cir	Westbound	A	A	C	D
	Southbound (*LT)	A	A	B	B
University Ave/ Dole St	Eastbound	E	E	E	E
	Westbound	E	E	E	E
	Northbound	D	D	D	D
	Southbound	D	D	D	D
University Ave/ Varsity Pl	Westbound	C	C	B	B
	Northbound	A	A	A	A
	Southbound	A	A	A	A
University Ave/ S. King St/ S. Beretania St	Eastbound	D	D	D	D
	Westbound	D	D	D	D
	Northbound	E	E	E	E
	Southbound	E	D	D	D
Wilder Ave/ Metcalf St	Eastbound	B	B	C	C
	Westbound	C	C	C	C
	Northbound	C	C	B	C
	Southbound	B	B	A	A
Wilder Ave/ Dole St	Eastbound	E	E	E	E
	Westbound	C	C	C	C
	Southbound	B	B	A	A
Dole St/ Lower Campus Rd	Eastbound	A	A	A	A
	Westbound	A	A	A	A
	Northbound	B	B	B	B

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

**LT = Left-Turn*

Under Year 2025 without project conditions, traffic operations are generally expected to remain similar to existing conditions. Along University Avenue, traffic operations at the intersections with Maile Way and Metcalf Street are expected to continue operating at LOS "C" or better during both weekday commuter peak periods while those at the intersection with Dole Street are expected to continue operating at LOS "E" or better during both peak periods. As previously discussed, the split phasing of the eastbound and westbound approach at the intersection of University Avenue and Dole Street and the high volume of traffic along University Avenue contribute to the queueing and delays at this intersection. Along Wilder Avenue, the approaches at the intersection with Metcalf Street are expected to continue operating at LOS "C" or better during both weekday commuter peak periods whereas those at the intersection with Dole Street are expected to continue operating at LOS "E" or better during both weekday commuter peak periods. The low levels of service at this two-way stop-controlled intersection are influenced by the relatively high volume of through traffic along Wilder Avenue which provide limited gaps in the traffic stream for vehicles on the side streets. It should be noted that the number of vehicles along the side streets are relatively low with minimal queueing observed during both peak periods. The remaining study intersections along Dole Street and University Avenue are generally expected to continue operating similar to baseline conditions.

The projected Year 2025 AM and PM peak period traffic volumes and operating conditions without the proposed projects associated with the LRDP are summarized in Table 3-12 below. The analysis incorporates the trips associated with the new Central Traffic Center, as well as ambient growth in the vicinity. The existing levels of service are provided for comparison purposes.

Table 3-12: Projected Year 2025 (Without and With Project) LOS Traffic Operating Conditions

Intersection	Approach	AM		PM	
		Year 2024		Year 2024	
		w/o Proj	w/ Proj	w/o Proj	w/ Proj
University Ave/ Maile Way	Eastbound	C	C	C	C
	Westbound	C	C	C	C
	Northbound	B	C	B	C
	Southbound	C	C	C	C
University Ave/ University Dwy	Westbound	A	A	A	A
University Ave/ Metcalf St	Eastbound	C	C	C	C
	Northbound	B	B	B	B
	Southbound	C	C	B	B
University Ave/ Sinclair Cir	Westbound	A	A	D	D
	Southbound (*LT)	A	A	B	B
University Ave/ Dole St	Eastbound	E	E	E	E
	Westbound	E	E	E	E
	Northbound	D	D	D	D
	Southbound	D	D	D	D
University Ave/ Varsity Pl	Westbound	C	C	B	B
	Northbound	A	A	A	A
	Southbound	A	A	A	A
University Ave/ S. King St/ S. Beretania St	Eastbound	D	D	D	D
	Westbound	D	D	D	D
	Northbound	E	E	E	E
	Southbound	D	E	D	D
Wilder Ave/ Metcalf St	Eastbound	B	C	C	C
	Westbound	C	C	C	C
	Northbound	C	C	B	B
	Southbound	B	B	A	A

Intersection	Approach	AM		PM	
		Year 2024		Year 2024	
		w/o Proj	w/ Proj	w/o Proj	w/ Proj
Wilder Ave/ Dole St	Eastbound	E	E	E	E
	Westbound	C	C	C	C
	Southbound	B	B	A	A
Dole St/ Lower Campus Rd	Eastbound	A	A	A	A
	Westbound	A	A	A	A
	Northbound	B	B	B	B
Dole St/ East-West Rd	Eastbound	A	B	B	B
	Westbound	A	A	B	A
	Southbound	B	B	B	C
Dole St/ St. Louis Dr	Eastbound	E	E	B	C
	Northbound (*LT)	B	B	A	A

Under Year 2025 with the Proposed Action, traffic operations at the study intersections in the immediate vicinity of the UHM are expected to deteriorate slightly from without project conditions. Along University Avenue, the approaches at the intersections with Metcalf Street and Dole Street are expected to continue operating similar to without conditions, but the northbound approach on Maile Way are anticipated to deteriorate from an LOS "B" to an LOS "C" at the during both peak periods. Along Dole Street, traffic operations at Lower Campus Road are expected to continue operating at LOS "B" or better during both weekday commuter peak periods but those at East-West Road are expected to operate slightly lower from an LOS "B" or better to an LOS "C" or better during the weekday commuter PM peak period. Although the development of the Central Traffic Center is expected to contribute to the deterioration of the levels of service at the primary access points, as indicated in the grant application prepared by UHM for the TMC, several transportation demand management strategies that are intended to facilitate an overall reduction of peak hour trips in the vicinity are also planned in conjunction with the Proposed Action. These include accommodations for ride-linking alternatives such as carpooling, car-share, bikeshare stations, and bus stops, and the implementation of demand-based economic incentives aimed at changing the way commuters access the campus each day. To incorporate the new facility and its associated TDM strategies within the overall TDM plan for UHM, the TDM plan previously prepared in April 2012 should be updated. The plan should include outline modal split targets for the university, identify pathways to implementation, and define measures of effectiveness (MOEs) to track progress. The remaining study intersections are expected to continue operating at levels of service similar to without project conditions.

The projected Year 2029 peak hour traffic conditions with the completion of Proposed Action are summarized in Table 3-13 below. The cumulative volumes consist of site-generated traffic superimposed over Year 2029 projected traffic demands. As previously discussed, the majority of the improvements in the Proposed Action are not anticipated to generate new external trips to the vicinity since they entail modernization and consolidation of existing uses. As such, the analysis only incorporates the development of other projects in the area including the Mixed-Use Housing Project P3 Project. The projected Year 2025 (With Project) operating conditions are provided for comparison purposes. Moreover, the City and County of Honolulu Department of Transportation Services plans to implement Complete Streets improvements in the vicinity of UHM, but timeline for this project is not known at this time. Although the City is expected to address their project's impact and coordinate the implementation of these improvements with UHM, a secondary assessment was conducted under Year 2029 with project conditions to incorporate the laneage reductions along University Avenue to as result of the Complete Streets project. It should be noted that the resulting levels of service with the Complete Streets project are provided for information only.

Table 3-13: Projected Year 2024 and Year 2029 (With Project) LOS Traffic Operating Conditions

Intersection	Approach	AM			PM		
		Year 2025 w/ Ph 1	Year 2029		Year 2025 w/ Ph 1	Year 2029	
			w/ Ph 2	w/ Ph 2 & CS*		w/ Ph 2	w/ Ph 2 & CS*
University Ave/ Maile Wy	Eastbound	C	C	C	C	C	C
	Westbound	C	C	C	C	C	C
	Northbound	C	C	C	C	C	C
	Southbound	C	C	C	C	C	C
University Ave/ University Dwy	Westbound	A	A	B	A	A	B
University Ave/ Metcalf St	Eastbound	C	C	E	C	C	D
	Northbound	B	B	B	B	B	B
	Southbound	C	C	C	B	B	C
University Ave/ Sinclair Cir	Westbound	A	A	A	D	D	B
	Southbound (LT**)	A	A	B	B	B	B
University Ave/ Dole St	Eastbound	E	E	E	E	E	E
	Westbound	E	E	F	E	E	F
	Northbound	D	D	D	D	D	D

	Southbound	D	D	E	D	D	E
University Ave/ Varsity Pl	Westbound	C	C	C	B	B	B
	Northbound	A	A	A	A	A	A
	Southbound	A	A	A	A	A	A
University Ave/ S. King St/ S. Beretania St	Eastbound	D	D	D	D	D	D
	Westbound	D	D	D	D	D	D
	Northbound	E	E	E	E	E	E
	Southbound	E	E	E	D	D	E
Wilder Ave/ Metcalf St	Eastbound	C	C	C	C	C	C
	Westbound	C	C	C	C	C	C
	Northbound	C	C	C	B	B	B
	Southbound	B	B	B	A	A	A
Wilder Ave/ Dole St	Eastbound	E	E	E	E	E	E
	Westbound	C	C	C	C	C	C
	Southbound	B	B	B	A	A	A
Dole St/ Lower Campus Rd	Eastbound	A	A	A	A	A	A
	Westbound	A	A	A	A	A	A
	Northbound	B	B	B	B	B	B
Dole St/ East-West Rd	Eastbound	B	B	B	B	B	B
	Westbound	A	A	A	A	A	A
	Southbound	B	B	B	C	C	C
Dole St/ St. Louis Dr	Eastbound	E	E	E	C	C	C
	Northbound (LT**)	B	B	B	A	A	A

**Incorporates the laneage modifications associated with the City and County of Honolulu's Compete Streets improvements along University Avenue*
***LT = Left-Turn*

Under Year 2029 with project conditions, traffic operations are generally expected to remain similar to Year 2025 with project conditions. Along University Avenue, traffic operations at the intersections with Maile Way and Metcalf Street are expected to operate at LOS "C" or better during both weekday commuter peak periods whereas those at the intersection with Dole Street is anticipated to continue operating at LOS "E" or better

during both weekday commuter peak periods. As previously discussed, traffic operations the intersection of University and Dole Street are expected to continue being influenced by the high volume of traffic along University Avenue requiring a greater proportion of the green time to be allotted to the main street. In addition, the split phasing of the eastbound and westbound approaches also contributes to the delays and queueing at this intersection. The remaining study intersections are also expected to continue operating similar to Phase 1 with project conditions.

Although the City and County of Honolulu are expected to address the impacts of their planned Complete Streets improvements and the levels of service are provided for information only, it should be noted that traffic operations could potentially deteriorate along University Avenue at the intersections with Metcalf Street and Dole Street as result of the lane reductions in conjunction with this project. In addition, this may have an impact to operations during Saturday events at the Clarence T.C. Ching Athletics Complex. As such, close coordination is needed given this project's anticipated impact to UHM's circulation and access along the surrounding roadways.

Pedestrian Facilities

The projects associated with the Proposed Action are expected to improve the overall pedestrian experience within the vicinity by increasing connectivity to existing pedestrian pathways and relocating existing parking areas outside of the core of the campus. In conjunction with the Kuykendall Hall Renovation, improvements are planned along Correa Road to transform the roadway to a restricted access roadway for low-speed vehicles and pedestrians only. An existing parking lot located at the end of Correa Road near Campus Center is also expected to be relocated in conjunction with Proposed Action. In addition, under the Snyder Hall Replacement and Varney Plaza Improvements Project, existing parking stalls on Campus Road will be relocated to transform that roadway into a new pedestrian-friendly pathway that will link to the existing McCarthy Mall and Legacy Path.

Due to the high volume of pedestrian traffic anticipated in the vicinity of the Clarence T.C. Ching Athletics Complex before and after events, pedestrian management strategies should be implemented to minimize conflicts with vehicular traffic. These strategies include the following:

- Create a pedestrian safety zone between the middle and DH accesses to the parking garage to provide a direct, safe connection to the parking garage on the 1st floor. Barricades should be provided on either end of this zone to ensure that vehicular traffic does not enter it during the event.

- Enhance the pedestrian environment for pedestrians entering the stadium from the southeast corner near Gates 5 and 6. The existing surface of the walkway could be repaved and directional signage provided to guide attendees to their destined entry gate.

- Maintain pedestrian access and circulation around the field within the Clarence T.C. Ching Athletics Complex.

- Use on-site security personnel or a 3 rd party contractor to assist with pedestrian management before and after the event. The use of personnel with recognizable

authority rather than volunteers should enhance pedestrian compliance with restrictions and adherence to designated routes.

- Consider restricting pedestrians from exiting the athletic complex at the end of the event via the existing access along the north side of the stadium to minimize the number of pedestrians crossing Kalele Road along that side of the stadium. It should be noted that ADA access may need to be maintained for this access.

- Consider closing the crosswalk across Kalele Road near the northeast corner of the stadium after the event to minimize pedestrian crossing volumes at this location. As previously indicated, ADA access may need to be maintained here, but should be actively managed.

- Provide adequate signage within the athletic complex to direct exiting attendees destined for the parking garage to Gates 2 or 3 to minimize the volume of pedestrians traveling along Kalele Road.

- Consider restricting pedestrian access to the sidewalk along Kalele Road east of Gate 2 after the event and actively redirecting pedestrians to the provided safe zone through the use of on-site security personnel. This would minimize the number of conflicts between pedestrians and vehicles along Kalele Road.

- Actively manage the crosswalk across Kalele Road near the northeast corner of the stadium after the event. Access to the sidewalk on the south side of the roadway should be blocked with pedestrians redirected to the north side to minimize conflicts between crossing pedestrians and vehicles further west. In addition, crossing activities should be actively managed and facilitated by on-site security who could alternate pedestrian crossing with vehicular through traffic along Kalele Road. Consolidating pedestrian crossing activities would enhance pedestrian safety and improve vehicular operations along Kalele Road.

It should also be noted that the CCH Department of Transportation Services is planning its Sidewalk Widening Improvement project which will create continuous bike lanes on University Avenue between Hihiwai Street and Maile Way. In order to maintain the existing land configuration on University Avenue mauka-bound between the H-1 on and off ramps and Dole Street, the design requires widening the sidewalk to 12 feet on the east side of University Avenue between the H-1 overpass structure and the Dole Street intersection to provide for pedestrians and mauka-bound bicyclists. The UHM will coordinate with the CCH Department of Transportation Services, as appropriate, as the project progresses.

Bicycle Facilities

The improvements under the Proposed Action are expected to enhance bicycle access within the UHM campus. As previously discussed, the Kuykendall Hall Renovation is expected to include roadway improvements along Correa Road to restrict access to that roadway for low-speed vehicles such as bicycles, scooters, and mopeds only. That improvement is expected to eliminate potential conflicts with vehicles that currently access an existing parking lot at the west end of that roadway.

In addition, the CCH has improvements planned to enhance existing facilities and provide additional facilities in the vicinity. According to the 2019 Update of the Oʻahu Bike Plan published by the CCH Department of Transportation Services, these improvements include the provision of a protected bike lane along University Avenue between Hiliwai Street and Maile Way, conversion of the existing bike lane along Dole Street to a protected bike lane, and the extension of the existing bike lane along Dole Street further east to St. Louis Drive. In addition, protected bike lanes are also planned along East-West Road and Maile Way through the UHM campus. These improvements are expected to enhance connectivity for bicyclists to the surrounding uses. However, details regarding the timeline of these improvements are not known at this time.

The following are bicycle management strategies provided for consideration in conjunction with events at the Clarence T.C. Ching Athletic Complex:

- Ensure that the bicycle facilities along Dole Street are maintained and kept free of parked vehicles during events to encourage their use by attendees.

- SDOs stationed at the intersection of Dole Street and Lower Campus Road could facilitate the progression of bicycle traffic through that intersection, especially during peak traffic periods.

- Maintain adequate lighting near bicycle parking areas within the Zone 20 parking zone to enhance user safety and encourage the use of bicycling to access events at the Clarence T.C. Ching Athletics Complex.

Transit Facilities

The Proposed Action is expected to enhance the existing transit facilities in the vicinity. Based on the information included in the grant proposal prepared by UHM for the Central Traffic Center, the proposed facility will incorporate designated areas for shuttles and buses with the project site expected to serve as a hub for transit facilitating plans to expand bus services in the project vicinity to include students who attend the nearby K-12 schools. Furthermore, the UHM has also been in coordination with the CCH Department of Transportation Services in anticipation of the completion of the future Honolulu rail system. The 20-mile rail system will extend between Kapolei and Kakaʻako to provide an alternate mode of travel and increase east-west mobility on Oʻahu’s most heavily congested corridor. That project is expected to be fully completed by Year 2025. To facilitate access to the future nearest station, a shuttle service operated by the OTS is planned between the UHM and the rail station. The drop-off/pick-up area for this new service is expected to be accommodated within the proposed Central Traffic Center.

Based on the analysis of the traffic data for the 2020 TIR, the following are the recommendations to be incorporated in the project designs to mitigate any potential impacts.

1. Maintain sufficient sight distance for motorists to safely enter and exit the project driveways to ensure pedestrians, bicyclists, and motorists are aware of the presence of each other at these conflict points.

2. Maintain adequate on-site loading and off-loading service areas and prohibit off-site loading operations.

3. Maintain 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. Maintain sufficient turning radii at all project driveways to avoid or minimize vehicle encroachments to oncoming traffic lanes.

5. Given the increase in available parking stalls, as well as changes to the distribution of parking stalls across campus, consideration should be given to implementing active management parking systems to monitor occupancy within the parking areas and disseminate real-time parking information to travelers for direct guidance to the available parking areas.

6. Consideration should be given to implementing parking management strategies in conjunction with active management parking systems to manage parking demand. These may include demand-based pricing to manage parking demand over the course of the day, providing parking availability information, and allocating stalls to different uses based on location. As an example, consider designating parking stalls located closer to the center of campus for all-day/faculty and staff parking since their arrival and departure times are more consistent and could be adjusted with demand management strategies. In addition, this would keep fluctuating parking demand by the general public and students in the Lower Campus parking garage and along the exterior roadways to campus.

7. During the design of the new Central Traffic Center, consider the placement of access controls, adequate passing and turning areas for vehicles to accommodate all types of anticipated vehicles, interface points for the different vehicle types, and the location and designation of parking stalls by type of use. In addition, given that the Central Traffic Center is expected to accommodate shuttles, busses, passenger vehicles, mopeds, scooters, and bicycles, consideration should be given to conflicts between these different uses and management strategies that could ensure the safe passage of pedestrians and bicyclists (non-motorized modes of travel) within the parking garage.

8. Prepare an overall wayfinding plan for the UHM campus with clear and concise messaging that facilitates bicycle, pedestrian, transit, passenger loading, and other transportation modes and activities. Consideration should be given to the location of decision points by mode and appropriate information that should be disseminated at those points.

9. Incorporate Complete Streets principles in the design where possible to enhance the pedestrian experience on-site and in the vicinity including wider sidewalk widths and the addition of sidewalk furniture and landscaping treatments.

10. Consider implementing enhanced on-site pedestrian and bike improvements at the internal intersections along East-West Road, Maile Way, and Lower Campus Road given the anticipated higher vehicular volumes along these roadways. These may include marked or protected crosswalks, painted intersections, raised crosswalks, bulb outs to reduce pedestrian crossing distance, and street lighting.

11. Consider preparing an overall lighting plan to provide a more comfortable pedestrian environment along highly traveled routes and to enhance safety and security during the evening hours.

12. During the implementation of the planned pedestrian improvements along Varney Circle and Campus Road, consider the interface between the proposed pedestrian pathway and the adjacent roadways given the anticipated increase in pedestrian volumes at this location as result of those improvements, as well as with the development of the adjacent Innovation Center.

13. Consider implementing improvements to enhance user experience and safety at major intermodal interface points along University Avenue, Dole Street, and Maile Way such as providing wayfinding signs, wider sidewalks, and street lighting.

14. Since moped parking is expected to be included in the new Transportation Management Center, consideration should be given to incorporating moped management as part of an overall Transportation Management Plan given the high number of moped use on campus, as well as the interface points between these vehicles with other transportation modes.

15. Coordinate with the CCH Department of Transportation Services regarding their plans for additional bike facilities in the project vicinity as well as through the campus. It should be noted that the O'ahu Bike Plan indicates bike improvements along the major roadways through campus that will require coordination to implement.

16. Given the direct effect the City and County's Complete Streets project is expected to have on the university's access and circulation, the City and County is expected to work with UHM to address their impacts in the vicinity. As previously discussed, these improvements are expected to reduce the existing laneage along University Avenue with on-street parking expected to be maintained. As such, UHM should coordinate with the City and County to prohibit parking along University Avenue to provide additional capacity for vehicles accessing the university's parking areas, particularly during event days at the Clarence T.C. Ching Athletics Complex.

17. Coordinate with the CCH Department of Transportation Services regarding any modifications to bus routes in the project vicinity since some of bus routes are expected to be modified to include the Central Traffic Center.

18. Continue to coordinate with the CCH Department of Transportation Services to implement a shuttle service between the UHM and the future nearest rail station.

19. Prepare a Construction Management Plan (CMP) for the development as a whole or in parts given the high volume of vehicular and pedestrian traffic in the vicinity. The CMP should include discussions regarding the anticipated construction schedule and phasing, as well as traffic circulation, traffic control, and parking for all transportation modes during the construction period.

20. Prepare a Transportation Management Plan or Transportation Master Plan for the UHM to encompass all the transportation facilities within the vicinity and identify traffic circulation, parking, and loading strategies to implement during special events, dormitory moving days, and other university events that are expected to result in an influx of traffic to the vicinity.

21. Update the Transportation Demand Management Plan previously prepared in April 2012 to incorporate the new facilities included under the Proposed Action, outline modal targets for the university, and identify pathways to implementation.

Clarence T.C. Ching Athletic Complex Events

Since the parking demand (discussed if detail below) is expected to exceed the limited number of on-site parking resources, the maximum number of available parking stalls represents the anticipated number of trips generated within the vicinity of UHM for this project. These trips are expected to be distributed over time based on attendees anticipated arrival and departure patterns. It should be noted that the arrival/departure patterns were expected to be similar for both the Upper and Lower Campus parking areas. For the purposes of the 2022 Clarence T.C. Ching Athletic Phase 2 Expansion TIR, the assessment focuses on the peak hour prior to the start of game since traffic volumes along the adjacent roadways are significantly higher during this period and post-game traffic has historically been handled well through coordination with the City and County of Honolulu and with the assistance of special duty officers (SDOs) at key locations in the vicinity. Historical data from large events indicates that most attendees depart within an hour of the end of the event from events held within Lower Campus. Although arrivals are assumed to span a longer period of time, the majority of attendees are expected to arrive within 1-2 hours of the start of the event. Table 3-14 below summarizes the trip generation characteristics related to the Clarence T.C. Athletic Complex Phase 2 Expansion applied to the Saturday PM peak hour of traffic.

Table 3-14: Saturday PM Peak Hour Trip Generation

CLARENCE T.C. CHING ATHLETICS COMPLEX		
		PROJECTED TRIP ENDS
CENTRAL CAMPUS AND UPPER CENTRAL CAMPUS	ENTER EXIT TOTAL	510 - 510
LOWER CAMPUS	ENTER EXIT TOTAL	1,275 - 1,275
TOTAL	ENTER EXIT TOTAL	1,785 - 1,785

Access to the Lower Campus parking garage is expected to continue being provided via Lower Campus Road with limited access provided off Kalele Road for special pass holders. Access to the Central Campus and Upper Central Campus parking areas is expected to continue being provided via East-West Road and Maile Way, with the exception of Zone 2 which is accessed directly off University Avenue. The directional distribution of all site-generated trips was based on the relative distribution of population on Oʻahu. In general, those traveling from the west were assumed to access the project site via the H-1 Freeway with the majority of those trips expected to utilize the eastbound off-ramp at the Mānoa Interchange to directly access University Avenue. A small portion of these trips are expected to bypass that ramp and utilize the off-ramp to westbound South King Street at the Kapiolani Interchange to access University Avenue based on field observations during other events with high attendance at UHM. Trips coming from the Windward side of Oʻahu were assumed to utilize the available regional roadways such as Pali Highway and Likelike Highway to access the H-1 Freeway (eastbound) following a similar route as those trips from the west. Trips from the east were distributed between the H-1 Freeway via the westbound off-ramp to University Avenue at the Mānoa Interchange, Dole Street via St. Louis Drive, and Kalele Road via Waialae Avenue, while those traveling from areas within the urban core of Honolulu were assumed to utilize South King Street. Site-generated trips were distributed between the Upper and Lower parking areas proportional to the number of parking resources available between these locations and routed to the parking areas based on their assumed origin/destination and relative convenience of the available routes.

Travel forecasts are typically based on historical traffic count data obtained from the HDOT, Highways Division at survey stations located along University Avenue in the vicinity of the project site. However, since weekday traffic volumes in the vicinity are still only returning to levels comparable to pre-pandemic levels and the assessment focuses on a non-weekday time period, ambient growth in traffic by the Year 2023 when the project is competed is expected to be nominal. As such, the Year 2022 baseline traffic volumes are generally assumed to also be representative Year 2023 traffic volumes for the purposes of the assessment.

The Year 2023 Saturday PM peak period traffic volumes and operating conditions with the Clarence T.C. Ching Improvements (with and without mitigation) are shown in Table 3-15 below. The baseline levels of service are provided for comparison purposes. The cumulative volumes consist of site-generated traffic superimposed over baseline traffic demands. The Year 2023 With Mitigation scenario incorporates recommended measures along the roadways in the vicinity of the project to facilitate traffic operations prior to the start of the event.

Table 3-15: Projected Year 2023 (Without and With Mitigation) LOS Traffic Operating Conditions

Intersection	Approach	Saturday PM Peak		
		Baseline	Year 2023 w/ Project	
			w/o Mitigation	w/ Mitigation
University Ave/ Maile Way	Eastbound	C	C	C
	Westbound	C	C	C
	Northbound	A	A	A
	Southbound	B	B	B
University Ave/ Metcalf St	Eastbound	B	B	B
	Northbound	A	A	A
	Southbound	A	A	A
University Ave/ Dole St	Eastbound	C	D	D
	Westbound	C	D	D
	Northbound	C	C	C
	Southbound	C	C	C
University Ave/ S. King St/ S. Beretania St	Eastbound	C	C	C
	Westbound	C	C	C
	Northbound	D	D	D
	Southbound	C	D	D
Dole St/ Lower Campus Rd	Eastbound	A	B	A
	Westbound	A	A	A
	Northbound	B	C	C
Dole St/ East-West Rd	Eastbound	A	A	A
	Westbound	A	A	A
	Southbound	A	A	A
Dole St/ St. Louis Dr	Eastbound	B	B	B
	Northbound (*LT)	A	A	A

*LT = Left-Turn

Traffic operations with the Clarence T.C. Ching Athletic Complex Phase 2 Expansion project are expected to deteriorate from baseline conditions with the project. Traffic operations at the intersections of University Avenue with Dole Street and Dole Street with Lower Campus Road are expected to be the most impacted by the influx of trips related to the football event. However, the use of level-of-service alone to assess operations with the project are insufficient to determine its impact due to the anticipated queuing resulting from entering traffic and the potential interaction with the nearby Interstate H-1 Freeway ramps. As such, to obtain a more comprehensive view of anticipated traffic conditions, a queueing assessment based on network simulations was also conducted. These simulations were calibrated based on field observations during a highly attended event at UHM and the resulting queuing along the adjacent roadway network. Field observations indicate that traffic operations along University Avenue south of Dole Street are influenced by the number of merging maneuvers that occur as vehicles accessing the freeway ramps interact with the northbound traffic on University Avenue. In addition, since there is only one right-turn lane along Dole Street entering Lower Campus Road, all vehicles accessing the parking areas within Lower Campus must merge into one curbside lane. This results in additional merging maneuvers along Dole Street and University Avenue that could compound the resulting queuing. It should be noted that the extent of queuing associated with events held at the UHM campus is closely related to the service time for vehicles at the booths along Lower Campus Road. As such, adequate planning and staffing, as well as streamlined transactions at these locations are necessary to ensure smooth and efficient traffic operations in the vicinity.

Without the implementation of mitigative measures, queues during the Saturday PM peak period with a football event at the Clarence T.C. Ching Athletic Complex are expected to extend from the entrance booths along Lower Campus Road where parking tickets/passes will be collected, onto Dole Street, wrap around onto University Avenue, and continue southward with the maximum back of queues expected in the vicinity of the intersection with S. King Street. Queues along the westbound freeway off-ramp are expected to be contained within the length of the off-ramp, but the maximum back of queue on the eastbound freeway off-ramp are expected to exceed the length of the ramp and extend onto the H-1 Freeway.As such, the following mitigative measures are recommended in addition to those outlined in the Transportation and Parking Management Plan for the Clarence T.C. Ching Athletics Complex to accommodate entering traffic for football events at UHM:

- Install cones along University Avenue between Varsity Place and Dole Street to separate northbound traffic from vehicles accessing University Avenue from the freeway eastbound and westbound off-ramps.

- In addition, as included in the TMP, utilize an SDO at the intersection of University Avenue and Dole Street to facilitate continuous right turn movements from the curbside lane unimpeded by the traffic signal while maintaining safe pedestrian movements across the turning lane.

- Modify the lane use on the northbound approach of the intersection of University Avenue and Dole Street to provide two exclusive right-turn lanes

to serve vehicles coming the freeway ramps and those coming from the south. This modification results in an exclusive left-turn lane and two through lanes, and two right-turn lanes on the northbound approach of the intersection.

- Provide advance signage and detour for the H-1 Freeway westbound on-ramp along the northbound direction of University Avenue. In addition, information about this ramp closure should be conveyed to the traveling public through the public information plan included in the TMP.

- Modify the lane use on the eastbound approach of the intersection of Dole Street and Lower Campus Road to provide two right-turn lanes into Lower Campus Road. Utilize SDOs at the intersection to assist right-turning vehicles from the outer lane. In addition, restrict left-turn movements from the westbound approach of the intersection.

With the implementation of the proposed mitigative measures, some queueing is still anticipated in the vicinity of the project; however, the extent of these queues is expected to be less. In general, queues are still expected to extend from the booths along Lower Campus Road onto Dole Street and University Avenue. However, the maximum extent of the queuing along University Avenue is expected to extend only to Varsity Place. Similarly, queues are still expected to form on the H-1 Freeway eastbound off-ramp, but most of these are expected to be accommodated within the length of the ramp without extending onto the H-1 Freeway. Table 3-16 below provides a summary of the average queue lengths expected with the proposed project without and with implementation of mitigation measures.

Table 3-16: Maximum Queues Without and With Implementation of Mitigative Measures

Intersection	Approach	Max Queues	
		w/out Mitigation	w/ Mitigation
Dole St and Lower Campus Rd to University Avenue	Eastbound	↓	↓
University Ave at Dole Street	Northbound	↓	↓
University Ave at WB Off-Ramp		↓	↓
University Ave at EB Off-Ramp		↓	110 ft
University Ave at Varsity Place		↓	277 ft
University at S. King Street		342 ft	-

WB Off-Ramp at University Ave	Westbound	265 ft	181 ft
EB Off-Ramp at University Ave	Westbound	↓	304 ft

↓=queues extend to through the next intersection

Based on the analysis of the traffic data, the following are the recommendations of the 2022 Clarence T.C. Ching Athletics Complex Phase 2 Expansion TIR[2] to be incorporated with project implementation:

1. Implement parking management, passenger loading management, traffic management, and pedestrian management strategies identified in the "Transportation and Parking Management Plan for the Clarence T.C. Ching Athletics Complex" (May 2022) which include measures intended to streamline vehicular traffic into the parking areas. In addition, as previously discussed, adequate planning and staffing is necessary to ensure effective implementation of the management strategies, some of which include:
    i. Provision of prepayment of parking to minimize delays at the parking garage entrance booths.
    ii. Provision of a 3rd entering lane starting along Lower Campus Road. In conjunction with this, reduced the number of exiting lanes from two to one.
    iii. Restriction of access for vehicles utilizing the Interstate H-1 Freeway westbound off-ramp access to Lower Campus Road to only vehicles with prepaid parking to minimize conflicts with other vehicles along Lower Campus Road.
    iv. Use of one of the entering lanes along Lower Campus Road for on-site parking purchase so the other entering lanes are not blocked by parking fee transactions at the parking booth.
    v. Provision of directional signage at key locations to direct motorists to their intended destinations including full matrix variable signs (VMS) at the intersections of Dole Street and University Avenue and Lower Campus Road and supplemental signage at the following locations:
        1. Near Sinclair Circle to highlight the entrance to the designated rideshare and other drop-off/pick-up area.
        2. Near Zone 2 (Architecture Parking Lot) to highlight the entrance to that upper campus public parking area.
        3. At the intersection of University Avenue and Maile Way and the intersection of Maile Way and East-West Road to direct motorists to upper campus parking areas
        4. Near the westbound off-ramp from the Interstate H-1 Freeway to Lower Campus Road with information regarding access restriction to prepaid parking access only if this management strategy is implemented.

[2] Please note that the TIR includes additional recommendations that are also mentioned in the other traffic studies. Hence, only recommendations not mentioned in the other traffic related studies are listed here.

vi. Use of SDOs at key intersections in the vicinity of UHM to facilitate traffic and pedestrian crossing movements including at the following locations:
    1. Dole Street midblock to facilitate pedestrian crossing movements at this location.
    2. University Avenue and Sinclair Circle (north) driveway to facilitate exiting traffic and enforce turning restrictions.

2. Prohibit events within Lower Campus that overlap with events at the Clarence T.C. Ching Athletics Complex. It should be noted that per the conditions in the PRU Minor Modification Permit 2021/MOD-72 (GT), no overlapping events are permitted in Lower Campus

3. Prepare a monitoring plan to obtain quantitative data to refine, adjust, and improve the management plans for future events. This data should include detailed parking data (i.e., parked vehicles every 15 or 30 minutes), attendance headcounts, and queuing observations.

4. Coordinate with the City and County of Honolulu Department of Transportation Services with regards to their plans to implement Complete Streets improvements along University Avenue. As previously discussed, these improvements are expected to reduce the existing laneage along University Avenue with on-street parking expected to be maintained. As such, UHM should coordinate with the City and County to prohibit parking along University Avenue on game days to provide additional capacity for vehicles accessing the parking areas.

5. Update the Transportation and Parking Management Plan for the Clarence T.C. Ching Athletics Complex to incorporate the recommendations included in the traffic impact study into their management plan.

The parking demand assessment conducted for Fall 2021 football events at the Clarence T.C. Ching Athletics Complex was based on historical data from major athletic events held at the Lower Campus facilities. Data from major events held in Lower Campus from 2019 and 2020 (prior to the pandemic) included turnstile attendance headcounts correlated with parking data from the parking garage. This data was used to derive a special events parking ratio that was used to project the parking demand for future events at the Clarence T.C. Ching Athletics Complex. It should be noted that although events were held on campus during the Fall 2021 season, due to the ongoing COVID-19 pandemic sufficient additional data was not able to be collected to supplement the historical data.

Attendance and parking data from events held in UHM Lower Campus was used to derive a site-specific parking demand rate for athletic events held on campus. A total of 21 events during 2019 and 2020 were reviewed to determine their applicability to future projections. The following were the criteria applied to each event to determine if they could be used during the analysis:

- Day of the week: Given that the UH Football events are expected to be held on Saturday evenings, only events that occurred on the weekends were used for comparison.

- Parking garage remained open: Events where the parking garage closed due to high demand were not used since the number of parked vehicles reflects the supply of parking in Lower Campus rather than the parking demand. It should be noted that the historical data indicates that the parking garage closes when attendance is between 6,500 and 7,000 attendees.

- Simultaneous events: The turnstile counts provided in the event reports only reflected the headcounts for the event cited in the report even though there may have been other events occurring simultaneously in Lower Campus. Event records where simultaneous events were documented in the notes without headcounts for every event lists were not included since the cited headcounts could not be correlated with the number of parked vehicles. For events where additional data was provided regarding the headcounts for each event, the turnstile numbers were modified to reflect the total headcount for all simultaneous events being held on campus.

In the end, there were only 7 events that met all of the aforementioned criteria. The resulting average parking rate from these events was 0.40 parking stalls/attendee (See Table 3-17 below).

Table 3-17: Average Parking Demand

Date	Attendance	Parked Vehicles	Parking Rate (stalls/attendee)
3/3/19 (Sun.)	5,065*	2,000	0.39
3/17/19 (Sun.)	3,827	2,300	0.40
9/1/19 (Sun.)	4,623	2,000	0.43
11/2/19 (Sat.)	5,010	2,200	0.44
11/3/19 (Sun.)	5,874	2,300	0.39
12/7/19 (Sat.)	6,950	2,800	0.40
2/16/20 (Sun.)	5,949	2,100	0.35
		Average	0.40

** Total headcount adjusted based on notes to reflect more than one event occurring in Lower Campus*

It should be noted that the use of on-campus event data to derive the parking rate already incorporates the influence of student attendees, who do not require parking because they live on campus, since student seating sections are typically provided for on-campus athletic events. The ultimate maximum capacity at the Clarence T.C. Ching Athletics Complex is expected to be 17,000 seats. Based on the average parking rate from previous athletic events held in Lower Campus, the UHM would need to provide approximately 6,800 parking stalls to accommodate the associated parking demand. UHM currently has a total of approximately 5,000 parking stalls throughout its Upper and Lower Campus, but not all of these parking areas can be opened up for public parking associated with these types of events. historical data indicates that the parking garage closes when attendance is between 6,500 and 7,000 attendees. Within this attendance range, the maximum number of event-related vehicles the garage can accommodate is approximately 2,700 vehicles due to residual parking, permit parking, and/or state/service vehicles.

Traffic demands associated with events at the Clarence T.C. Ching Athletics Complex will be distributed over time based on attendees anticipated arrival and departure patterns. Similar to the Fall 2021 season, parking for football will open 3 hours prior to the start of events with tailgating by attendees prohibited. Without the attraction of pre-game tailgating events, event attendees are expected to time their arrivals based on the amount of delay they expect to encounter accessing allocated parking areas. As such, most attendees are expected to arrive within 1-2 hours of the start of the event. The duration of this arrival peak will be dependent on whether attendees have guaranteed parking through prepayment or must “beat the rush” to secure a parking space. After the event, most attendees are expected to depart within an hour of the end of the event as indicated by historical data from events held within Lower Campus. These short but intense periods of traffic demand in the vicinity of UHM will require the implementation of appropriate parking and traffic management strategies to minimize their impact on the surrounding roadways and neighborhoods.

TDM strategies are a set of strategies that represent the most cost-effective blend of multimodal options. As the name implies, TDM is focused on the behavioral side of transportation (i.e., demand) rather than simply infrastructure (i.e., supply) to promote the more efficient utilization of existing transportation facilities and maximize the potential for alternative transportation usage. The following list of recommended strategies (some of which the UHM is already implementing) is not intended to be a fully comprehensive list and could be supplemented with more extensive measures should the need arise.:

- Multiple parking options/locations
- Differential pricing for parking options/locations
- Prepayment of parking fees
- Designated passenger loading areas including ride share pick-up/drop-off areas
- Wayfinding strategies including directional signage at key locations
- Active pedestrian management to minimize conflicts and enhance safety
- Robust public information plan/campaign
- Monitoring of the effectiveness of implemented strategies
- Periodic updates to the TDM plan based the plan’s effectiveness

UHM Parking Resources & Management

UHM will be able to accommodate up to 3,500 vehicles within their designated public parking areas and up to 500 vehicles within their reserved parking areas to support event parking associated with events at the expanded Clarence T.C. Ching Athletic Complex. However, parking demand is still expected to exceed this capacity by up to 2,800 vehicles (UHM would need to provide 6,800 stalls to meet demands). Prior to the Fall 2021 season, when parking for an event at UHM exceeded the capacity, vehicles were turned away and had to either chose not to attend the event or were forced to find off-site parking on their own. This approach has secondary impacts as vehicles spread out through the adjacent neighborhoods seeking other off-site parking options. Given the expected high demand associated with events at the Clarence T.C. Ching Athletics Complex, designated off-site parking resources should be incorporated into the overall parking management plan. UH Football events previously held at Aloha Stadium incorporated a wide array of off-site parking options including designated parking at Leeward Community College (LCC) served by shuttles before and after the game. A similar approach could be adopted for events at UHM by designating off-site parking options at key locations served by shuttle services. Attendees will have the option (secured partnership between Draft EA and Final EA) to park at Kapiolani Community College (KCC) which has approximately 1,300 parking stalls and the shuttle ride to/from KCC would be approximately 20 minutes each way similar to the shuttle ride to/from LCC. Similarly, attendees from the west could be given the option to park within the portions of Aloha Stadium not actively under redevelopment and the shuttle ride to/from Aloha Stadium would also be approximately 20 minutes each way depending on traffic conditions. It should be noted that at this time UHM has not designated any off-site parking locations. These locations should be determined prior to the Fall 2022 season with additional management strategies implemented as appropriate for those locations.

The following are the recommended parking management strategies that UHM should implement for future events at the expanded Clarence T.C. Ching Athletic Complex:

- Designate specific areas on-campus for event public parking and ensure that vehicles parked in these areas do not exceed the maximum capacity. The maximum capacity within upper campus has been set at 1,000 vehicles while the maximum capacity within lower campus has been set at 2,500 within Zone 20.

- Actively manage parking before and after events within the designated upper campus event public parking areas to ensure safe and efficient parking operations.

- Restrict permit parking within the designated areas for event public parking to eliminate residual vehicles in these areas. Faculty, staff, and students with permit can be relocated to other parking areas

- Designate off-site parking options with shuttle service to provide the balance of stalls needed to accommodate the anticipated parking demand. Suggested locations are KCC and Aloha Stadium served with shuttles to provide access to/from UHM.

- Implement a differential pricing structure for events that accounts for the relative distance, convenience, and services provided at each location.

- Implement prepaid parking for event parking to allow management and staff to better plan for events and force attendees to manage their expectations regarding parking and access before they arrive. Also consider allowing the prepurchase of ADA parking passes to ensure that adequate ADA parking stalls are available in each designated area and develop a public information system/process through online or radio channels to notify attendees when UHM closes on-site purchases for parking within Zone 20.

- Coordinate with special interest groups and private parking locations in the vicinity to provide additional parking options for attendees. These options would not be operated by UHM, but information about these options could be disseminated to attendees through their public information plan.

There is an existing bus pull out located along University Avenue at Sinclair Circle with a relatively long length of curb. Adequate curb space should be reserved for this bus with the remainder allocated for active passenger pick-up and drop-off operations. UHM will continue to designate this area as the rideshare and other pick-up and drop-off area for future events at the expanded Clarence T.C. Ching Athletic Complex. In addition, the adjacent visitor parking lot could be allocated as a vehicle waiting area to minimize the number of vehicles queued within the active loading area within Sinclair Circle. It should be noted that there is another passenger loading area located within Lower Campus to accommodate attendees with mobility issues. Attendees utilizing this area can walk along University Avenue and Dole Street to access the signalized midblock crosswalk along Dole Street (approximately 5-minute walking distance). From there, they can directly access the elevators, stairs, and designated pedestrian pathways within the adjacent Zone 20 parking structure to connect to the Clarence T.C. Ching Athletic Complex. The location of this designated ride share area must be conveyed to the general public and attendees to encourage use of this area, and the use of this pullout area should be coordinated with the CCH to ensure that passenger loading operations do not interfere with City bus route service. In addition, consideration should be given to actively managing the drop-off/pick-up area within Sinclair Circle before and after the event to minimize queuing within the active loading area.

Off-site parking locations will be needed to accommodate the anticipated parking demand for events at the expanded Clarence T.C. Ching Athletic Complex. These off-site locations should be served by shuttles transporting attendees to/from the event and a designated area is necessary to accommodate passenger loading/unloading for these shuttles. This loading area should be within a reasonable distance from the Clarence T.C. Ching Athletics Complex to provide convenient access but located outside of Lower Campus to ensure that the shuttles do not conflict with vehicles accessing the event parking areas. There is CCH bus stop located along Dole Street just past the signalized midblock crosswalk along that roadway. The shuttle buses serving the off-site parking location could be staged along Dole Street west of the midblock with loading/unloading activities occurring at the bus stop. Given the anticipated headways of the buses and maximum capacity of the complex, approximately 3-5 buses are expected to be staged along Dole Street with one of the buses located at the CCH bus stop actively loading/unloading passengers. Use of this bus stop and the curbside lane along Dole Street should be coordinated with the CCH to ensure that event passenger loading does not interfere with

City bus route service. During weekend hours when the events are expected to occur, approximately 3 buses per hour are expected until 6:30 PM and 1 bus per hour thereafter. Attendees utilizing the off-site parking shuttle service would directly access the elevators, stairs, and designated pedestrian pathways within the adjacent Zone 20 parking structure to connect to the Clarence T.C. Ching Athletic Complex on either the 1st or 3rd floors.

The following are recommended passenger loading strategies that the UHM should implement for future events at the expanded Clarence T.C. Ching Athletic Complex:

- Designate a rideshare pick-up/drop-off area near Sinclair Circle off University Avenue within the existing bus pullout area and provide a vehicle waiting area in the adjacent visitor parking lot. The designation and location of this area should be conveyed to the general public and event attendees. In addition, exiting maneuvers from this area should be restricted to right-turn movements only and the use of this area should be coordinated with the CCH.

- Adequate signage should be provided to direct attendees to cross from the parking garage to the athletic complex either on the 1st or 3rd floors of the garage. In addition, consideration should be given to providing staff or other on-site personnel within the parking structure on the 1st and 3rd floors to assist with pedestrian safety and wayfinding.

- Designate a passenger loading/unloading along Dole Street at the City bus stop near the signalized midblock along that roadway for the shuttles serving the off-site parking locations. The use of this stop and the curbside lane for staging should be coordinated with the City and County of Honolulu.

Event Traffic Management

The UHM should implement the following traffic management strategies for UHM events with regards to entering traffic:

- Provision of traffic control devices (cones) and a Special Duty Officer (SDO) at the intersection of University Avenue and Dole Street to facilitate continuous right turn movements from the curbside lane while maintaining safe pedestrian movements across the turning lane. It should be noted that during the Spring 2022 Football Event, the curbside right-turn lane from University Avenue to Dole Street was coned off to allow right-turning vehicles to continue through the intersection unimpeded by the traffic signal. An SDO was provided at this location during those operations to ensure safe and efficient operations.

- Stationing personnel off-site along Dole Street and University Avenue to monitor queuing along those roadways, as well as onto the adjacent ramps to the Interstate H-1 Freeway.

- Modification of the lane use on the eastbound approach of Dole Street at the intersection with Lower Campus Road to facilitate double right-turn traffic movements onto Lower Campus Road. Provision of this additional turning lane

would reduce merging maneuvers along Dole Street between University Avenue and Lower Campus Road of vehicles accessing the lower campus parking area.

- Increasing the number of personnel assigned to verify parking passes and collect parking fees. Additional personnel could be assigned per entering lane to process vehicles quicker and minimize the delay at the parking booths.

- Designating one of the entering lanes along Lower Campus Road for onsite parking purchase so the other entering lanes are not blocked by parking fee transactions at the parking booth.

- Restricting access for vehicles utilizing the Interstate H-1 Freeway westbound off-ramp access to Lower Campus Road to only vehicles with prepaid parking to minimize conflicts with other vehicles along Lower Campus Road. In conjunction with this strategy, additional personnel should be assigned to verify parking passes for these vehicles to minimize their dwell time near the parking booths.

- Supplementing UHM staff and student personnel assigned to events by contracting a 3rd party company (i.e., security company) to ensure that there is adequate staffing for parking and traffic management before and after events.

- Provision of Special Duty Officers (SDOs) at additional key intersections in the vicinity of UHM to facilitate traffic and pedestrian crossing movements which include the following locations

    - Dole Street midblock to facilitate pedestrian crossing movements at this location.
    - University Avenue and Sinclair Circle (north) driveway to facilitate exiting traffic and enforce turning restrictions.

- Prohibition of through traffic along Kalele Road between the middle and DH garage accesses to create a pedestrian safe zone. Personnel should be stationed on either end of this safe zone to direct vehicular traffic and ensure no vehicles enter this zone.

The UHM should implement the following traffic management strategies for UHM events with regards to exiting traffic:

- Supplementing UHM staff and student personnel assigned to events by contracting a 3rd party company (i.e., security company) to ensure that there is adequate staffing for parking and traffic management before and after events.

- Removal of the 3rd exiting lane along Lower Campus Road north of the parking booths and restriction of exiting turning movements to left-turns only at the intersection of Dole Street with Lower Campus Road to minimize conflicts with vehicles from upper campus parking areas and pedestrians crossing Dole Street at that intersection.

- Restriction of exiting turning movements onto Dole Street from the Zone 17 parking area (near the Law building) to right-turn movements only to minimize conflicts with other vehicles from lower campus parking areas.

- Provision of Special Duty Officers (SDOs) at additional key intersections in the vicinity of UHM to facilitate traffic and pedestrian crossing movements which include the following locations

    - University Avenue and Maile Way intersection to facilitate exiting traffic at this location.
    - Dole Street and East-West Road intersection to facilitate exiting traffic and pedestrian crossing movements at this location.
    - Dole Street midblock to facilitate pedestrian crossing movements at this location.
    - University Avenue and Sinclair Circle (north) driveway to facilitate exiting traffic and enforce turning restrictions.

- Implementation of pedestrian management strategies in conjunction with vehicular traffic management strategies to minimize conflicts, enhance safety, and facilitate exiting operations after events.

In addition, the UHM should implement the following traffic management strategies:

- Designate appropriate parking areas for events that allow for diverse access routes and implement a public information plan to inform attendees of these routes.

- Provide full matrix variable message signs (VMS) at the intersections of Dole Street with University Avenue and Lower Campus Road to allow for more complex messaging and directional guidance. In addition, supplemental signage (either static or variable message) should be provided at key locations to direct motorists to their destinations.

- Maintain and supplement traffic management strategies implemented before and after events for vehicles utilizing the Zone 20 parking area. Supplemental strategies include provision of additional SDOs and other staff at key location in the vicinity, laneage modifications at the intersection of Dole Street with Lower Campus Road, designating specific locations for on-site purchases of parking passes for Zone 20 parking, designation of a pedestrian safe zone, and implementation of pedestrian management strategies

- Consideration of supplementing UHM staff and student personnel assigned to events by contracting a 3rd party company (i.e., security company) to ensure that there is adequate staffing for parking and traffic management before and after events.

A robust public information plan should be implemented for events at the Clarence T.C. Ching Athletic Complex to advise attendees about transportation and parking options and restrictions. For the Fall 2021 season, UHM provided information prior to events including

parking, ride share/drop-off information, and field access. UHM should continue to implement this public information plan for future events at the Clarence T.C. Ching Athletic Complex through as many media options as possible including a dedicated website, e-mail communication, broadcast media (radio and television), social media, and printed media (flyers and newspapers). The goal of this widespread outreach would be to ensure that attendees know to plan ahead for events including how and when they will travel there, and where they will park. Disseminated information should include:

- On-campus parking options with information on differential pricing and prepayment options for parking.
- Traffic routes to/from the designated on-campus parking areas.
- Pedestrian circulation and access around the Clarence T.C. Ching Athletics Complex before and after the event.
- Real time notifications about the status of on-campus parking areas to let attendees know when parking areas are sold out/full.
- Information about other parking options for events including the location, operations, and cost of off-site parking areas provided by UHM, as well as links to those operated by special interest groups and/or other private entities if available.
- Location of the designated ride share pick-up/drop-off location and any associated loading and/or dwelling restrictions. Coordinate with ride share companies (i.e., Uber and Lyft) to encourage the use of this area by their drivers.
- Information about alternate transportation options to events including the public bus system and bicycle facilities/parking.

The parking and traffic demand assessments included in this plan were based on historical data from other events held in Lower Campus during 2019 and 2020. The collection of data specific to events held at the Clarence T.C. Ching Athletics Complex would refine these assessments and provide insight regarding the effectiveness of the transportation demand, parking, passenger loading, traffic, and pedestrian management strategies. The following data should be collected for future events:

- Vehicles parked in each of the designated on-campus parking areas.
- Attendance at each event (turnstile counts)
- Vehicular and pedestrian counts at the Varsity gate (entering and exiting) since attendees may elect to park nearby and walk to the event via this gate
- Vehicular counts at the Waialae gate
- Time required to clear the Zone 20 parking area after the event

- Documentation of incidents before, during, and after the event pertaining to vehicular, pedestrian, and/or bicycle traffic
- Documentation of all management strategies implemented during events (per event if they vary from event to event)
- Documentation of any complaints received in conjunction with events held at the Clarence T.C. Ching Athletics Complex
- Vehicular counts within the designated ride share area (pick-up/drop-off activities)
- Turning movement vehicular, pedestrian, and bicycle counts at key intersections in the vicinity of UHM including the intersections of University Avenue with Dole Street, Metcalf Street, and Maile Way, and Dole Street with Lower Campus Road
- Pedestrian counts at the crosswalk across Kalele Road near the northeast corner of the stadium
- Queuing observations before and after the event along Dole Street and University Avenue (south of Dole Street)

3.13 Visual Resources

Hawai‘i’s visual resources are important to the State’s tourism industry and the quality of life enjoyed by the State’s residents. The State’s visual resources include a broad range of natural and developed areas and a tremendous variety of land uses, water bodies, and vegetation types. These visual resources also include urbanized areas that range from small rural towns to the metropolitan center of Honolulu.

The visual characteristics of the UHM campus 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 UHM campus include the Mānoa Stream and Wa‘ahila Ridge. Unobstructed views of Mānoa Stream may be obtained while on the pedestrian bridge across Dole Street or other points of access across the UHM campus. More distant scenic resources include Diamond Head Crater, Waikīkī Beach and the Ko‘olau Mountains beyond Mānoa Valley.

As noted in Section 3.6, the UHM campus boasts an exceptional collection of heritage landscapes which endows the broad, low-sloping plain of Mānoa Campus with a mature tree canopy and a significant diversity of native to exotic flora. The beauty of these landscapes softens the urban characteristics of the campus, whose buildings and vehicular accesses are often considered to lack cohesiveness and aesthetic appeal. Natural geographic features, such as Mānoa Stream and the Ko‘olau mountains, complement the informal groupings of tropical and sub-tropical botanic collections that compose the heritage landscapes. The contrast between building and landscape weaves the fabric of the UHM campus, providing most areas with shade, comfort, aesthetic pleasure, pride, and educational value.

Lower Campus
The Lower Campus is considered to have significant landscapes at the Music Building Complex and Kamakakūokalani Center for Hawaiian Studies. The Music Building Complex includes a series of buildings separated by courtyards and open-air hallway spaces. The Ka Papa Loʻi o Kānewai at the Kamakakūokalani Center for Hawaiian Studies includes a hale, several small structures and a collection of taro patches and native trees compose the site.

Central Campus
The Central Campus has several significant landscapes at the College of Education Complex, the Sinclair Library, the Quad Building Complex, Varney Circle, McCarthy Mall, Miller Hall, Holmes Hall, Hemenway Hall, Bachman Hall, Andrews Outdoor Theatre, Life Sciences Building, Building 37 – iLab, Bilger Hall, Keller Hall, University Health Services Building, Krauss Hall Complex, and the East-West Center Campus.

Upper Central Campus
Upper Central Campus is not considered to have any significant landscapes.

Mauka Campus
Mauka Campus is not considered to have any significant landscapes.

Impacts and Mitigation Measures
The Proposed Action is not anticipated to have any significant impacts on visual resources. The Proposed Action would remain consistent with the existing visual character of the UHM campus and the surrounding area, including both the urban and natural settings.

With regards to the existing significant landscapes, these are not anticipated to be impacted by the Proposed Action. Where the New Construction/Replacement of Existing Structures (Net Increase) Projects are sited to occur, there are no significant landscapes in the immediate vicinity. In fact, as a part of this Proposed Action, a Landscape Master Plan is being developed for the subsequent PRU Permit. The UHM’s landscape is one of its most valuable and distinctive attributes, the UHM’s goal is to celebrate its unique natural assets. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources. Thus, it is anticipated that any significant plants or landscapes that may need to be removed or altered to implement the Proposed Action would be returned to existing conditions to the extent feasible or enhanced.

3.14 Socio-Economic Characteristics

The CCH accounts for 68.8% of the State's total resident population, down from 69.7% just a few years ago. Based on the latest population projections, Honolulu’s population is expected to continue climbing, but at a slower rate than the other counties. By 2045, the county is projected to be home to nearly 1.074 million residents. However, the average annual growth rate is

predicted to slow from 0.4% between 2020 and 2030 to 0.1% by 2045. The projected population increases will result in increased demand for housing and public services across the island.

The UHM campus is located within the Urban Honolulu Census Designated Place (CDP). Demographic and other information was reviewed from the U.S. Census 2010 for the Urban Honolulu CDP and the CCH provided by the State of Hawai'i Department of Business, Economic Development, and Tourism (See Table 3-18 below).

Table 3-18: Demographic Characteristics

Subject	Urban Honolulu CDP		City and County of Honolulu	
	Number	Percent	Number	Percent
Total Population	**337,256**	**100**	**953,207**	**100**
AGE				
Under 5 years	16,677	4.9	61,261	6.4
5-19 years	50,395	15	174,309	18.3
20-64 years	210,022	62.3	579,147	60.8
65 years and over	60,162	17.8	138,490	14.5
Median age (years)	41.3	--	37.8	--
RACE				
White	60,409	17.9	198,732	20.8
Black or African American	4,974	1.5	19,256	2.0
American Indian and Alaskan Native	743	0.2	2,438	0.3
Asian	184,950	54.8	418,410	43.9
Native Hawaiian or other Pacific Islander	28,260	8.4	90,878	9.5
Two or more races	55,080	16.3	213,036	22.3
Other	2,840	0.8	10,457	1.1
HOUSEHOLD (BY TYPE)				
TOTAL HOUSEHOLDS	**129,408**	**100**	**311,047**	**100**
Family households (families)	74,688	57.7	328,953	70.0
Married-couple family	52,431	40.5	161,172	51.8
With own children under 18 years	2,062	1.6	65,995	21.2
Female householder, no husband present	15,689	12.1	39,435	12.7
With own children under 18 years	5,321	4.1	15,027	4.8
Nonfamily household	54,720	42.3	93,205	30.0
Average household size	2.51	--	2.95	--
HOUSING OCCUPANCY AND TENURE	**143,173**	**100**	**336,889**	**100**
Total Housing Units	129,408	90.4	311,047	92.3
Occupied Units	56,742	43.8	174,387	56.1
By owner	72,666	56.2	136,660	43.9

By renter Vacant Units	13,765	9.6	25,852	7.7

Based upon the data shown on the table, the Urban Honolulu CDP has a slightly older population than the City and County of Honolulu. The median age of the population for the Urban Honolulu CDP was 41.3 versus 37.8 for the County.

By racial mix, the Urban Honolulu CDP has a higher percentage of Asians (54.8%) than the County (43.9%). The Urban Honolulu CDP has a lower percentage of Whites (17.9%) and those of two or more races (16.3%) than the County (20.8% and 22.3%, respectively). These three races (Asian, Whites, and those with two or more races) make up the majority of proportion than the County as a whole, with 8.4% and 9.5%, respectively.

According to the 2010 Census, the Urban Honolulu CDP has a slightly lower occupancy rate, 90.4%, than the County, 92.3%. Housing units in this region are largely occupied by renters at 56.2%. The County data is slightly different from that of the Urban Honolulu CDP in that a larger proportion of housing units are occupied with owners.

Impacts and Mitigation Measures

No significant impacts are anticipated to result from the construction or operation of the Proposed Action. In the short- term, construction expenditures related to the Proposed Action will provide positive benefits to the local economy. This would include creation of construction and construction support jobs, and the purchase of materials from local suppliers, as well as indirect benefits to local retail businesses resulting from construction activities. In the long-term, the Proposed Action will also provide much needed facilities to support the various programs offered at the UHM which will provide students the opportunity to be successful academically and professionally to pursue their socio-economic aspirations.

3.15 Public Services and Facilities

3.15.1 Police, Fire, and Medical Services

Police protection is provided by the Honolulu Police Department. The UHM campus is part of District 7 – East Honolulu, Sector 12, which covers the downtown Honolulu area to Ala Moana Beach from Punahou Street to Makapu‘u Point. The UHM campus is served by the Police Headquarters located at 801 South Beretania Street, approximately 2 miles to the west.

Additionally, the University has their own on campus security that operates under Department of Public Safety (DPS) located on campus that provides 24/7 year-round protection and security for the UH Manoa Campus. The Public Safety Department is headed by Chief Andrew P. Black and is comprised of an Operations Team, a Command Staff and a Lead Team. DPS offers many services to the campus community, including (but not limited to):

- Incident management: response, investigation, and documentation.
- Victim/survivor assistance.
- Emergency preparedness and management.
- Educational outreach: events, programs, and presentations.

- Campus safety escort service provides safe travel through campus from dusk until dawn.
- Facility lock-up and unlock.
- Active shooter response training.
- Special event staffing.
- Adherence and reporting according to federal laws: Title IX, Jeanne Clery Act, Violence Against Women Act (VAWA), and the Campus Sexual Violence Elimination (SaVE) Act.
- Site-specific security assessments and emergency plans.
- Special event services.
- Other related security and emergency management functions.

Fire protection is provided by the Honolulu Fire Department. The Honolulu Fire Department has four stations in the proximity of the UHM campus. Current UH policy calls for access to fire apparatus, water supply and building construction to be in conformance with existing relevant codes and standards.

Routine and emergency medical services are provided by the University's Student Health Service. If a situation arises that is beyond University's Student Health Service's capabilities, the case is referred to the patient's doctor and/ or to local hospitals. With numerous major hospitals or clinics in relative proximity to the UHM campus, prompt attention is available to patients in medical emergencies. The closest hospital to the project area is Kapi‘olani Medical Center for Women and Children located at 1319 Punahou Street, approximately 1 mile southwest of the UHM campus. Kapi‘olani Medical Center for Women and Children is part of Hawai‘i Pacific Health and has more than 1,500 employees and 630 physicians on staff. The next closest hospital is Straub Medical Center, which is also part of Hawai‘i Pacific Health, and is located at 888 South King Street, approximately 2 miles southwest of the project area. Straub Medical Center employs over 350 physicians in more than 32 different medical specialties.

Emergency medical service is provided by the City's Emergency Services Department, Emergency Medical Services (EMS) Division. The Department has 20 ambulance units under two districts. All ambulance units are designated as advanced life support units, meaning they are staffed by at least two people. The UHM campus is served by District 2, which includes the southeast region of O‘ahu. The Honolulu Fire Department also co-responds to medical emergencies, providing first aid in coordination with EMS.

Impacts and Mitigation Measures

In the short-term, the Proposed Action may have impacts such as temporary disturbance of traffic, which could affect emergency vehicle access through the UHM campus. During the construction period, flagmen or off-duty police officers may be present to direct traffic and emergency vehicles.

In the long-term, the Proposed Action may require occasional police and fire protection, as well as medical services, however it would likely not represent a significant amount relative to the overall regional demand. It is recommended that new buildings be built in consideration of public safety by installing such features as ample lighting, necessary signage, and other safety measures to keep the public safe, in an effort to reduce the need of emergency services.

The Proposed Action will be designed and built-in compliance with the Uniform Fire Code, as amended by the city and County of Honolulu. Fire protection systems should be

installed in all new buildings. Fire protection systems should include an automatic sprinkler system. Smoke detection system, heat detection system, carbon dioxide-based automatic fire suppression system, manual fire extinguishers, and fire alarm system. Habitable rooms should contain audio/visual and visual signaling devices as required by the fire code and the accessible guidelines. Dry standpipe system should be provided at exit stairs and other areas as required by the Building Code.

3.15.2 Education

The UHM campus 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 UH 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.

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts or increase in demand on DOE schools are anticipated. It is unlikely the Proposed Action will induce population or enrollment growth. Therefore, it is not expected to affect student enrollment at public schools or at UHM. In the long-term, the Proposed Action will also provide much needed facilities to support the various programs offered at the UHM which will provide students the opportunity to be successful academically and professionally to pursue their socio-economic aspirations.

3.15.3 Recreational Facilities

A county park offering recreational facilities is in close proximity to the UHM campus and operated and managed by the CCH 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. 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 adjacent to the UHM campus along Dole Street. Other DPR facilities within proximity include Kamānele Square, Kalo Place Mini Park and Kalaepōhaku Neighborhood Park (Mānoa District Park).

The UHM also provides several recreational facilities and programs for the UHM community. 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, special programs and outdoor education programs.

Lower Campus
Amenities on Lower Campus include Clarence T.C. Ching Complex, Duke Kahanamoku Aquatic Complex, Les Murakami Stadium, Rainbow Wahine Softball Stadium, Stan Sheriff Center, UH Tennis Complex, Klum Gym, Gym 1, Gym 2, Gym 3, and various practice fields. SRS, as well as the athletics programs at UHM use the various athletic facilities to meet the needs of their programs.

Central Campus
The main recreational facility on Central Campus is the UHM Warrior Recreation Center, which offers two basketball courts, an indoor track, cardio machines, and weights. However, several student groups will often use the various open space areas for various recreational activities such as Bachman Lawn and the lawn fronting Holmes Hall.

Upper Central Campus
There are no recreational facilities located on Upper Central Campus.

Mauka Campus
There are no recreational facilities located on the Mauka Campus.

Impacts and Mitigation Measures
No significant impacts are anticipated to occur from the construction or operation of the Proposed Action. The Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project is expected to expand the existing facility to approximately 17,850 spectators in order to meet NCAA and FBS competition requirements that mandate a minimum attendance of 15,000 spectator average over a two-year period. Hence, in the long-term, the Proposed Action will support the needs to the UHM and the UH Football program by providing a facility that can allow them to meet NCAA requirements. However, it should be noted that the SRS intramural program also used this facility to conduct its operations for Flag Football, Ultimate Frisbee, Outdoor Soccer, and Softball. Since the Clarence T.C. Ching Athletic Complex Temporary Phase 1 Expansion Project, the field has been renovated and no longer possesses soccer regulation lines. Moreover, the large bleachers have been erected around the field. Hence, it is expected that the SRS intramural program will no longer be able to conduct games for Outdoor Soccer and Softball due to the improvements for Clarence T.C. Ching Athletic Complex Temporary Expansion Project. The UHM and its various departments should coordinate to ensure programs, such as the SRS intramural program, are able to use alternative facilities to conduct their operations.

3.15.4 Solid Waste Collection and Disposal

Solid waste collection and disposal service is provided by the ENV for incineration at the Campbell Industrial Park H-POWER Plant that generates electricity, followed by disposal of ash and non-combustibles at the Waimanalo Gulch Sanitary Landfill.

Construction and demolition material is disposed of at the privately-owned PVT landfill in Wai‘anae. The exceptions are the student housing and food service programs, which separately contract out refuse collection to private refuse disposal firms. The bulk of “green waste” from the UHM campus is now composted and is not disposed of as refuse. Recycling programs exist on campus and are managed by separate schools and programs.

Impacts and Mitigation Measures
The Proposed Action is not anticipated to result in significant impacts to solid waste collection and/or disposal. The Proposed Action is not anticipated to result in a greater daily demand of services at the UHM campus with regards to solid waste collection. In the long-term, the Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Project may result in a higher demand of services during game days, however, UH Football games only occur six to seven times a year and is not considered to be significant as there are services that can accommodate solid waste generation for larger events.

3.16 Infrastructure and Utilities

3.16.1 Water System

A Draft Water Master Plan (WMP) was prepared by R.M. Towill Corporation in April 2022 to evaluate the Proposed against the existing water system at the UHM campus and recommend improvements to address any identified deficiencies (See Appendix C).

Water for domestic use and fire protection is provided to the UHM campus and surrounding area through the CCH BWS municipal water system. The majority of the UHM campus is served by the BWS high service system via a 20-inch ductile iron transmission main which runs through the Central Campus. The high service system provides static water pressures ranging from 120 to 150 pounds per square inch (psi). The Lower Campus is served by BWS' low service system via 12-inch transmission mains along University Avenue and Dole Street. The low service system provides static pressures ranging from 38 to 75 psi. The water system is further described in the subsections below and depicted in Figure 3-2 of Appendix C.

Lower Campus
Lower Campus is served by the 12-inch, BWS water main that runs along Dole Street. The Lower Campus connects to an 8-inch looped system from two connections off of the 12-inch water main along Dole Street.

The WMP calculated the average daily water demands based on a calculated demand rate of 43 Flow per Capita (gpcd). Table 3-19 below shows the average water demand for the existing condition.

Table 3-19: Summary of Existing Water Demands – Lower Campus

Study Area	Capita	Existing Design Average Daily Water Demand (mgd)
Lower Campus	4,728	0.203

Central Campus
The diamond-head side of Central Campus is currently served by a 20-inch, BWS transmission line. The 20-inch line runs along University Avenue and Maile Way before running through Farrington Road, McCarthy Mall, and East-West Road. The transmission line eventually runs offsite near the project site for the Mixed-Use Housing P3 Project along Dole Street.

The ʻEwa-side of the Central Campus is generally served by the 12-inch, BWS water main that runs along Metcalf Street, University Avenue, and Dole Street.

The WMP calculated the average daily water demands based on a calculated demand rate of 43 gpcd. Table 3-20 below shows the average water demand for the existing condition.

Table 3-20: Summary of Existing Water Demands – Central Campus		
Study Area	**Capita**	**Existing Design Average Daily Water Demand (mgd)**
Central Campus	20,031	0.861

Upper Central Campus

Upper Central Campus is currently served by a UH-owned main, which varies in size from 8- to 12-inches, that runs along East-West Road. The main serving the Upper Central Campus connects to a 20-inch BWS water main, near Kennedy Theater.

The WMP calculated the average daily water demands based on a calculated demand rate of 43 gpcd. Table 3-21 below shows the average water demand for the existing condition.

Table 3-21: Summary of Existing Water Demands – Upper Central Campus		
Study Area	**Capita**	**Existing Design Average Daily Water Demand (mgd)**
Upper Central Campus	2,845	0.122

Mauka Campus

The Mauka Campus is currently served by 2-inch laterals that tap off of a 12-inch BWS main that runs along Woodlawn Drive.

The WMP calculated the average daily water demands based on a calculated demand rate of 43 gpcd. Table 3-22 below shows the average water demand for the existing condition.

Table 3-22: Summary of Existing Water Demands – Mauka Campus		
Study Area	**Capita**	**Existing Design Average Daily Water Demand (mgd)**
Mauka Campus	1,648	0.071

Table 3-23 below summarizes the various projects under the Proposed Action and the adjacent water infrastructure that would serve the project.

Table 3-23 Existing Water Systems			
Campus Portion	**LRDP Project**	**Private UH-Owned System**	**BWS System**
Lower Campus	Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion	6- to 8-inch Laterals (Onsite)	
	ROTC Facility	12-inch Main (Lower Campus Road)	
	Zone 2 – Fiscal Management Portable Building Demolition	12-inch Main (Lower Campus Road)	
Central Campus	Student Success Center: Sinclair Library Renovation	3-inch Lateral (Onsite)	12-inch Main (University Avenue)
	Mini Master Plan Phase 2 (Snyder Hall Replacement and Varney Circle Improvements)	4-inch Lateral (Onsite)	20-inch Main (Onsite: McCarthy Mall)
	Hamilton Library Renovation	6-inch Lateral (Onsite)	20-inch Main (Onsite: McCarthy Mall)
	Kuykendall Hall Renovation	8-inch Main (Correa Road)	
	Keller Hall Renovation	2-inch Lateral (Onsite)	20-inch Main (Onsite: McCarthy Mall)
	Holmes Hall Renovation	12-inch Main (East-West Road)	
	Lincoln Hall Annex Portable Building Demolition	8-inch Lateral 12-inch Main (East-West Road)	20-inch Main (Onsite: McCarthy Mall)
	Zone 1- Administrative Zone Portable Building Demolition	2-inch Lateral (Offsite)	
	Zone 4 – UH Lab School Portable Building Demolition	8- to 12-inch Main (Onsite)	
	Mixed-Use Affordable Housing P3 Project		12-inch Main (Dole Street)
	Innovation Center P3 Project	12-inch Main (Metcalf Street)	
Upper Central Campus	Central Traffic Center	12-inch Main (East-West Road)	
	Central Administration Facility	12-inch Main (East-West Road)	

	Zone 3 – Transportation/Facilities Services Portable Building Demolition	8-inch Main (East-West Road)	
Mauka Campus	Zone 5 – UH Press Portable Building Demolition	2-inch Lateral (Onsite)	12-inch Main (Woodlawn Drive)

Impacts and Mitigation Measures

The WMP projected a preliminary average daily water demand for the Proposed Action to confirm the available water capacity of the private and BWS water system to serve the Proposed Action which is summarized in Table 3-24 below.

Table 3-24: Summary of On-Campus Water Demands

Campus Portion	Capita		Design Average Wastewater Flow (mgd)		
	Existing	Proposed	Existing	Proposed	Increase
Lower Campus	4,728	4,728	0.203	0.203	0.000
Central Campus	20,031	20,229	0.861	0.870	0.009
Upper Central Campus	2,845	3,308	0.122	0.142	0.020
Mauka Campus	1,648	1,617	0.071	0.070	-0.001
Total	**29,252**	**30,047**	**1.825**	**1.849**	**0.027**

1 The P3 populations are not included in Table 3-24

Applicable projects under the Proposed Action will require new water service or result in an increase in water demand will be required to submit water availability requests to BWS during the design phase. Water availability request letters shall be based on programming for the subject development and the estimated average daily water demand. BWS' response will confirm adequacy of the BWS' water system to support the subject project or if there are any capacity issues with the BWS system at the time. The final decision on the availability of water will be made when the building permit application is submitted for approval.

Projected water demands from the Proposed Action will be served by on-site water lines and will connect to the existing water system. Actual line sizes and routing will need to be determined during the design phase of the applicable projects under the Proposed Action. It is anticipated that new backflow preventers, valves, and underground piping will also be required.

Additional water improvements identified in the WMP consist of the following (See Figures 3-3 in Appendix C):

Lower Campus

No new improvements to the existing water system serving the Lower Campus are anticipated. The existing system will have sufficient water pressure to accommodate the domestic and fire protection demands resulting from the Proposed Action.

Central Campus
As outlined in the WMP, portions of the high-system and low-service systems serving the Central Campus are unable to supply the minimum 2,000 gpm of fire flow, as noted in the BWS Standards dated 2002. Existing hydrants J-U7 and J-U38 located along the east portion of Campus Road, which are currently served by the high-service system, were unable to meet BWS' minimum peak water pressure. Existing hydrants J-L5 and J-L6 near the University Lab School and hydrants J-L8 near Bachman Hall, which are currently served by the low-service system, were unable to meet BWS' minimum peak water pressure.

As such, there are three proposed improvements, outlined below, to the Central Campus water systems in order to meet the fire demand requirements of the BWS standards.

- Create a loop by connecting the water line mauka of Sinclair Library to the water line mauka of the campus Center with a 6-inch water line.

- Upsize the existing 6-inch fire line on the diamond-head side of Bachman Hall to a 12-inch fire line.

- Upsize the 3- and 4-inch water lines between University Lab School and Wist Hall to 12-inch water lines.

Upper Central Campus
No new improvements to the existing water system serving the Upper Central Campus are anticipated. The existing system will have sufficient water pressure to accommodate the increase in domestic and fire protection demands resulting from the Proposed Action.

Mauka Campus
No new improvements to the existing water system serving the Mauka Campus are anticipated. The existing system will have sufficient water pressure to accommodate the increase in domestic and fire protection demands resulting from the Proposed Action.

In general, the proposed water system improvements for each applicable project under the Proposed Action should cumulatively consider other projects and their demand on the overall water system. may also be required dependent upon various factors. Trenching and backfilling of proposed sewer lines will follow CCH standards and the Soils Engineers recommendations. During the design phases, the calculated water demands from the subject project will determine the required meter and lateral size. Moreover, the UH will be required to provide water demands and calculations for the various projects to the State Department of Land and Natural Resources Engineering Division so it can be included in the State Water Projects Plan Update projections. The UH will be required to pay the Water System Facilities Charges for resource development, transmission, and daily storage when water is made available. Moreover, it is required by the BWS that water conservation measures be implemented for all new construction projects under the Proposed Action. 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.

3.16.2 Wastewater System

A Draft Sewer Master Plan (SMP) was prepared by R.M. Towill Corporation in April 2022, updating the Draft SMP from 2018, to describe the wastewater plan under the Proposed Action. The SMP evaluates the existing wastewater infrastructure against anticipated sewer demand projections based on the Proposed Action and provides recommended improvements to address identified deficiencies.

The UHM campus is served by a combination of CCH and private (UH-owned) gravity wastewater collection systems, which also carry off-site flow from Mānoa Valley. The UHM campus is located within the CCH's Sand Island Collection System area where wastewater flow is conveyed via gravity sewers to the Ala Moana Pump Station where the flow is pressurized, and eventually reaches the Sand Island Wastewater Treatment Plant for treatment and disposal.

Lower Campus

The majority of the wastewater generated from Lower Campus is conveyed by private 12-inch and smaller lines to the CCH's sewer lines on Varsity Place and University Avenue. Per the SMP, the CCH's University Avenue-Varsity System is over-capacity and that all additional wastewater flows from the Lower Campus should ultimately be diverted to the sewer tunnel on Dole Street. The Lower Campus sewer systems are described in further detail below and depicted in Figure 3-3 of Appendix B.

Sewer line 'F', which consists of private sewer lines that vary in size from 6- to 12-inches, is located throughout the Lower Campus and runs along Lower Campus Road. System 'F' eventually connects to the CCH's 12-inch sewer line at Varsity Circle.

Sewer line 'G', which consists of private 6-inch force mains and an 8-inch gravity line, is located near the Klum Gym along Lower Campus Road. Sewer line 'G', which also accepts discharge from the Stan Sheriff Center, eventually discharges to the CCH system at the 48-inch sewer tunnel that runs along Dole Street.

Sewer line 'H', which consists of private sewer lines that vary in size from 4- to 6-inches, is located near Holmes Hall. System 'H' eventually discharges to the CCH system at the 48-inch sewer tunnel that runs along Dole Street.

Sewer line 'I', which consists of private sewer lines that vary in size from 6- to 8-inches, is located near Frear Hall. System 'I' eventually discharges to the CCH system at the 48-inch sewer tunnel that runs along Dole Street.

Sewer line 'J', which consists of private sewer lines that vary in size from 4- to 8-inches, is located near The Waʻahila Faculty Housing Complex. System 'I' eventually discharges to the City system at the 48-inch sewer tunnel that runs along Dole Street.

Sewer line 'M', which consists of private 8-inch sewer lines, is located near the Kamakakūokalani Center for Hawaiian Studies. System 'M' eventually discharges to the City system at the 48-inch sewer tunnel that runs along Dole Street.

The SMP calculated the average wastewater demands based on the UHM campus population data for the Lower Campus provided by UH in 2019. Table 3-25 below shows the average wastewater flow for the existing condition.

Table 3-25: Summary of Existing Wastewater Demands – Makai Campus			
Study Area	**Capita [1,3]**	**Existing Design Average Wastewater Flow (mgd) [2]**	**Flow per Capita (gpcd)**
Lower Campus	4,728	0.409	86.5

[1] Excludes St. Francis School and offsite populations.

[2] Design average flows include dry weather infiltration/inflow.

[3] For population breakdowns, see Appendix A “Existing/Proposed Population Distributions” in the SMP

Central Campus

The Central Campus is served by the five of the main sewer systems at the UHM campus. The SMP identifies the five systems as Sewer lines ‘A’, ‘B1’, ‘C’, ‘D’, and ‘E’, which are described further below and depicted in Figure 3-2 of Appendix B.

Sewer line ‘A’, which consists of CCH sewer lines that vary in size from 8- to 36-inches, is located on the diamond-head side of the Central Campus. Sewer line ‘A’ serves the Mauka Campus, Upper Central Campus, and nearly half of the Central Campus. System ‘A’ eventually connects to the City’s 60-inch trunk sewer, which runs along Dole Street, near Holmes Hall.

Sewer line ‘B1’, which consists of private 6-inch sewer lines, is located on the ʻEwa side of Sakamaki Hall. System ‘B1’ connects to the CCH system at the 48-inch sewer tunnel, which runs along Dole Street, near Sakamaki Hall.

Sewer line ‘C’, which consists of CCH sewer lines that vary in size from 6- to 10-inches, runs along Metcalf Street, Campus Road, and various portions of the Central Campus. Sewer line ‘C’ eventually connects to Sewer line ‘E’ at the intersection of Metcalf Street and University Avenue.

Sewer line ‘D’, which consists of private sewer lines that vary in size from 6- to 12-inches, is located on the ʻEwa-side of Andrews Amphitheater. System ‘D’ eventually connects to the CCH system at the 48-inch sewer tunnel, which runs along Dole Street, near Bachman Hall.

Sewer line ‘E’, which consists of 12-inch City sewer lines, is located near Sinclair Library along University Avenue. System ‘E’ eventually connects to the CCH’s 48-inch sewer tunnel, which runs along Dole Street, near Bachman Hall.

The SMP calculated the average wastewater demands based on the UHM campus population data for the Central Campus provided by UH in 2019. Table 3-26 below shows the average wastewater flow for the existing condition.

Table 3-26: Summary of Existing Wastewater Demands – Central Campus			
Study Area	**Capita [1,3]**	**Existing Design Average Wastewater Flow (mgd) [2]**	**Flow per Capita (gpcd)**
Central Campus	20,031	1.213	60.5

[1] Excludes St. Francis School and offsite populations.
[2] Design average flows include dry weather infiltration/inflow.
[3] For population breakdowns, see Appendix A “Existing/Proposed Population Distributions” in the SMP

Upper Central Campus

The Upper Central Campus is served by Sewer line ‘A’. Sewer line A within the Upper Central campus consists of the CCH’s 15 to 18-inch diameter parallel sewer lines running along the ʻEwa border of the Upper Central Campus. The private sewer system consisting of 8-inch and smaller sewer lines convey wastewater from facilities along the Diamond Head side of the Upper Central Campus to Sewer line ‘A’. Sewer line ‘A’ eventually continues through Central Campus as described above (See Figure 3-2 of Appendix B).

The SMP calculated the average wastewater demands based on the UHM campus population data for the Upper Central Campus provided by UH in 2019. Table 3-27 below shows the average wastewater flow for the existing condition.

Table 3-27: Summary of Existing Wastewater Demands – Upper Central Campus			
Study Area	**Capita [1,3]**	**Existing Design Average Wastewater Flow (mgd) [2]**	**Flow per Capita (gpcd)**
Upper Central Campus	2,845	0.163	57.3

[1] Excludes St. Francis School and offsite populations.
[2] Design average flows include dry weather infiltration/inflow.
[3] For population breakdowns, see Appendix A “Existing/Proposed Population Distributions” in the SMP

Mauka Campus

The Mauka Campus is currently served by the CCH’s 15 to 24-inch diameter parallel sewer lines within Woodlawn Avenue. Sewer line ‘A’ eventually continues through the Upper Central Campus and Central Campus as described above (See Figure 3-2 of Appendix B).

The SMP calculated the average wastewater demands based on the UHM campus population data for the Mauka Campus provided by UH in 2019. Table 3-28 below shows the average wastewater flow for the existing condition.

Table 3-28: Summary of Existing Wastewater Demands – Mauka Campus			
Study Area	**Capita [1,3]**	**Existing Design Average Wastewater Flow (mgd) [2]**	**Flow per Capita (gpcd)**
Mauka Campus	1,648	0.025	14.9

[1] Excludes St. Francis School and offsite populations.
[2] Design average flows include dry weather infiltration/inflow.
[3] For population breakdowns, see Appendix A “Existing/Proposed Population Distributions” in the SMP

Table 3-29 below summarizes the various projects under the Proposed Action and the adjacent sewer infrastructure that would serve the project.

Table 3-29 Existing Sewer Systems			
Campus Portion	**LRDP Project**	**Private UH-Owned System**	**CCH System**
Lower Campus	Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion	Sewer line ‘F’	
	ROTC Facility	Sewer line ‘F’	
	Zone 2 – Fiscal Management Portable Building Demolition	Sewer line ‘F’	
Central Campus	Student Success Center: Sinclair Library Renovation		Sewer line ‘E’
	Mini Master Plan Phase 2 (Snyder Hall Replacement and Varney Circle Improvements)		Sewer line ‘A’
	Hamilton Library Renovation		Sewer line ‘A’
	Kuykendall Hall Renovation		Sewer line ‘A’
	Keller Hall Renovation		Sewer line ‘A’
	Holmes Hall Renovation		Sewer line ‘A’
	Lincoln Hall Annex Portable Building Demolition		Sewer line ‘A’
	Zone 1- Administrative Zone Portable Building Demolition	Sewer line ‘D’	
	Zone 4 – UH Lab School Portable Building Demolition		Sewer line ‘C1’ Sewer line ‘E’ Sewer line ‘K’
	Mixed-Use Affordable Housing P3 Project	Sewer line ‘I1’	
	Innovation Center P3 Project		Sewer line ‘C1’
	Central Traffic Center		Sewer line ‘A’
	Central Administration Facility		Sewer line ‘A’

Upper Central Campus	Zone 3 – Transportation/Facilities Services Portable Building Demolition		Sewer line 'A'
Mauka Campus	Zone 5 – UH Press Portable Building Demolition		Sewer line 'A'

Impacts and Mitigation Measures

DPP's Wastewater Branch (WWB) reviews and authorizes sewer connection applications (SCA) for developments that require sanitary sewer service. Each project under the Proposed Action requiring new sewer service will be required to submit an SCA to DPP's WWB for review and approval prior to connection. During SCA review, the WWB determines if the CCH sewer system is adequate to support the sewer demand for the subject project and will identify any sewer system improvements required. Should the SCA be approved, it would be valid for a two-year period. During the two-year period, complete construction plans need to be submitted by the UHM, for review, and approval by WWB. Once the construction plans are approved, construction activities are required to commence within one (1) year. An updated or revised sewer connection application could be submitted to request an extension, if required for project completion. However, it should be noted that an extension or approval of the updated SCA is subject to agency review and is not readily ascertained.

The SMP calculated a preliminary average daily sewer demand based on the program information for the overall LRDP development to confirm the available capacity of the private and City sewer system to accommodate the proposed development. Table 3-30 below summarizes the projected change in average wastewater flow for the existing and proposed conditions.

Table 3-30: Summary of Increase in Wastewater Demands

Campus Portion	Capita		Design Average Wastewater Flow (mgd)		
	Existing	Proposed	Existing	Proposed	Increase
Lower Campus	4,728	4,728	0.409	0.406	-0.003
Central Campus	20,031	20,374	1.217	1.190	-0.027
Upper Central Campus	2,845	3,327	0.174	0.231	0.057
Mauka Campus	1,648	1,613	0.025	0.022	-0.003
Total	**29,252**	**30,047**	**1.825**	**1.849**	**-0.024**

1 Excludes St. Francis School and offsite populations
2 Design average flows include dry weather infiltration/inflow
3 Excludes P3 Projects

According to the SMP, the CCH modeled the anticipated flows that were calculated based upon the Proposed Action to confirm if the capacity of the existing CCH system can accommodate the projected flows. Initial results indicate that several 18 and 24-inch pipe segments on Sewer Line A and A4 are deficient and upsizing these deficient segments is recommended.

The SMP will be submitted to WWB for review and approval. WWB's response will confirm if any City sewer infrastructure needs to be constructed to provide a sewer connection for the LRDP projects. UHM may be responsible for the required infrastructure improvements if a UH project requires a new sewer connection before the City provides the necessary sewer improvements. However, the existing UH privately-owned sewer system was found to be adequate. Hence, capacity upgrades to the UH privately-owned on-site sewer system will not be required to accommodate the Proposed Action.

It is anticipated that sewage flows from the New Construction/Replacement of Existing Structures (Net Increase) Projects will be collected by new sewer laterals within the UHM campus and will connect to the existing sewer system infrastructure. The proposed onsite sewer improvements will consist of new sewer manholes, cleanouts, and underground piping to provide lateral connections to the new buildings. New sewer lateral locations and sizes will be verified during the design phase. Additional sewer improvements identified in the SMP, based on the CCH Infoworks Flow Model, consist of the following (See Figures 4-2 and 4-3 in Appendix B):

Lower Campus

The Clarence T.C. Ching Athletic Complex Phase 2 Expansion Project requires improvements to the Lower Campus sewer collection system to accommodate the anticipated increase in wastewater demand from the project. The SMP identifies two Lower Campus sewer improvement alternatives:

- Reconfiguring the Lower Campus sewer system to optimize the gravity sewer system to maintain the Clarence T.C. Ching Athletic Complex’s existing sewer connection to Varsity Circle.

- Provide a new pressure and gravity sewer system to discharge added sewer flow to the Dole Street Sewer collection system. This alternative includes design of a sewage pump station (wet well dual redundancy pumps, and alarm), gravity sewer system, and sewer force main. Gravity flow from the stadium will flow to a future sewage pump station that is anticipated to be located on the east side of the Ching Complex. Once in the sewage pump station, additional flows would be pumped via sewer force main into an existing Sewer Tunnel Manhole located within Dole Street. WWB has approved a preliminary SCA for this alternative (discussed in Section 2.2.5.2).

Central Campus

The CCH Infoworks Flow Model suggests that, based on the projected sewer demands of the Proposed Action, pipe segments along Sewer Line A and A4 are deficient. Recommended improvements include upsizing Sewer Line A4 from 18-inches to 24-inches between Sakamaki Hall and Bilger Hall (approximate 380-LF). A 24-inch Sewer line ‘A” pipe segment located Ewa of Hamilton Library between SMH A13 and A14 (approximate 123-LF) should also be upsized to 30-inches.

Upper Central Campus

The CCH Infoworks Flow Model suggests that, based on the projected sewer demands of the Proposed Action, upsizing the deficient 27-inch Sewer line ‘A’ pipe segment mauka of

the Agricultural Engineering Institute between SMH A19 and A19-B1 (approximate 15-LF) to 30 inches is recommended.

Mauka Campus
No new improvements to the existing sewer system serving the Mauka Campus are anticipated.

In general, the proposed sewer improvements for each applicable project under the Proposed Action should cumulatively consider other projects and their demand on the sewer system. Sewer improvements such as branch-offs, extensions, stub-outs, larger pipe size, and additional structures may also be required dependent upon various factors. Trenching and backfilling of proposed sewer lines will follow CCH standards and the Soils Engineers recommendations. The WWB will confirm the required improvements to the CCH sewer infrastructure when the UHM submits an SCA for the applicable projects under the Proposed Action during the design/permitting phase. Upon CCH approval of the SCAs, and construction plans, along with payment of the sewer facilities charges, the proposed system can be connected to the CCH sewer system.

3.16.3 Drainage System

A Draft Drainage Master Plan (DMP) was prepared by R.M. Towill Corporation in April 2022 to describe the drainage plan for the UHM under the Proposed Action. The evaluates the existing storm drainage system on the UHM campus, recommends drainage improvements, and evaluates the potential impacts to the UHM campus resulting from a large storm event.

The existing storm drainage system that serves the UHM campus consists of a network of grated drain inlets, catch basins, underground drain lines and culverts, swales, ditches, and other drainage structures (See Figure 4-1 of Appendix D).

Lower Campus
Lower Campus is relatively flat and is developed with large athletic facilities, parking structure, and portable classrooms. The area around the existing ROTC Buildings, Clarence T.C. Ching Athletic Complex, Les Murakami Stadium and Duke Kahanamoku Pool is a sump, which is designed to contain excess runoff generated within the Makai Campus. The existing sump provides a volume of 8.7 ac-ft to contain excess runoff generated within the Lower Campus. Runoff from rainfall on the Lower Campus is collected by two main drainage systems, identified as Existing Drainage System ‘L’ and ‘M’ in the DMP.

Existing Drainage System ‘L’, which consists of a series of drain inlets, catch basins, a 6’x6’ box drain, a 4’x4’ box drain, and drain lines that vary in size from 18- to 60-inches. Existing Drainage System ‘L’ eventually connects offsite to the CCH drainage system located along Varsity Plaza.

Existing Drainage System ‘M’, which consists of a series of drain inlets, catch basins, a 5’x2’ box drain, a 5’x4’ box drain, and drain lines that vary in size from 18- to 36-inches. Existing Drainage System ‘M’ eventually connects to the Existing Drainage System ‘L’.

As determined in the DMP, Drain Systems ‘L’ and ‘M’ were assessed based on a 50-year design storm due to the sump condition at the Lower Campus. Hydraulic analysis of Drain System ‘L’

indicates inadequate freeboard throughout the entire system, even during the 10-year event. Flow in the last section of the system is restricted due to a reduction in conduit sizes as the storm water travels downstream. Additionally, the stormwater discharge is further bottlenecked at the connection to the City's 36-inch drain line at University Avenue.

Central Campus

Central Campus drainage area receives the most runoff from on- and offsite in comparison to the other UHM campus areas. Offsite runoff is generated within the surrounding northwest portion of Mānoa Valley. Generally, runoff sheet flows from mauka to makai and is collected by drain inlets and catch basins. A low point on Maile Way channels any excess flow through the center of campus past the Hamilton Library, Bilger Hall, continuing to the buildings surrounding Legacy Path.

Runoff from rainfall on Central Campus generally sheet flows from mauka to makai and is collected by five of the main drainage systems. The five main drainage systems located within the Central Campus are identified in the DMP as Existing Drainage Systems 'A', 'B', 'C', 'D', and 'E'.

Existing Drainage System 'A', which consists of a series of drain inlets, catch basins, 48-inch drain lines, and a 4'x4' box drain, is located near the intersection of Maile Way and East-West Road. In addition to accepting runoff from rainfall on Central Campus, Existing Drainage System 'A' also receives runoff from the Upper Central Campus via the Mid-Pacific Institute ditch.

Existing Drainage System 'B', which runs through Central Campus conveys the highest volume of offsite and onsite flow of all existing drain systems on campus. The system consists of a series of drain inlets, catch basins, a 3'x6' box drain, a 6'x4' box drain, a 6'x6' box drain, and a 7'x6' box drain, and 18-inch drain lines. In addition to accepting runoff from rainfall on Central Campus, Existing Drainage System 'B' also accepts runoff from the Mid-Pacific Institute Ditch. System 'B' eventually discharges to Manoa Stream via a box outlet near the Hale Hālāwai Building. Drainage System 'B' also receives runoff from the Upper Central Campus via the concrete rubble masonry (CRM) ditch.

Existing Drainage System 'C', which consists of a series of drain inlets, catch basins, and drain lines that vary in size from 18- to 30-inches, runs along East-West Road. Existing Drainage System 'C' eventually connects to the 7'x6' box drain as a part of Existing Drainage System 'B'.

Existing Drainage System 'D', which consists of a series of drain inlets, catch basins, and drain lines that vary in size from 18- to 30-inches, generally runs from mauka to makai. System 'D' eventually connects to an 84-inch drain line as part of Existing Drainage System 'E' near Andrews Amphitheater.

Existing Drainage System 'E', which consists of a series of drain inlets, catch basins, and drain lines that vary in size from 18- to 96-inches, runs along University Avenue and Dole Street. System 'E' eventually discharges to Mānoa Stream via a pipe outlet near the NOAA Property.

The DMP hydraulic analysis identifies the following inadequacies in the Central Campus drainage system:

Drainage System ‘A’ – DMP hydraulic calculations show that the junctions along the 48-inch main, north of St. John Laboratory are inadequate to accommodate a 10-year storm event and storm runoff will overflow from Upper Central Campus inlets west of East-West Road and backup within the Mid-Pacific Institute ditch.

Drainage System ‘B’ – This drainage system collects runoff from an area greater than 100 acres and therefore should be analyzed based on a 100-year storm event. However, offsite drainage systems upstream of System ‘B’ are inadequate to support the 100-year storm event and flow into the system is restricted to 90-cfs by the capacity of a 24-inch drain line and by the capacity of the CRM ditch west of System ‘B’. Runoff from the 100-year storm will overtop the CRM ditch along Maile Way and sheet flow through the Central Campus toward Hamilton Library and Snyder Hall continue to Sakamaki and Krauss Hall, cross Dole Street, and enter the Lower Campus. The overflow from this ditch during a 100-year storm event is expected to follow the same flow path to that of the 25-year storm event that occurred in October 2004 in which portions of the Central Campus, namely the Hamilton Library and Biomedical Sciences Building, were inundated.

Since the amount of runoff that can enter System ‘B’ is limited to 90 cfs by the capacity the upstream drainage systems, the DMP hydraulic analysis for System ‘B’ is based on a 10-year storm. Based on the analysis, portions of drainage system along Maile Way, McCarthy Mall, and Paradise Palms were determined to be inadequate to handle runoff generated by a 10-year storm.

Drainage System ‘C’ – The entire system was determined to be inadequate to support the runoff generated by a 10-year storm and is the most undersized campus drainage system. The DMP indicates that about 25% of the runoff contributing to this system is from Saint Francis School

Drainage System ‘D’ - The entire system was determined to be hydraulically inadequate to support runoff from a 10-year storm due to the inadequacies at the downstream connection to System ‘E’.

Drainage System ‘E’ - All junctions upstream of Holmes Hall were found to be hydraulically inadequate for the 10-year storm which can be attributed to the high starting HGL in comparison to surrounding finish ground elevations of at the drain connection along Dole Street.

Upper Central Campus

Runoff from rainfall on the mauka portion of Upper Central Campus generally sheet flows from mauka to makai where it is collected by the CCH system, which consists of drain inlets, drain manholes, vegetated ditches, box drains, and drain lines that vary in size from 18- to 54-inches. Runoff from the mauka portion of the Upper Central Campus then discharges to the Mid-Pacific Institute Ditch. As mentioned previously, discharge from the Mid-Pacific Institute ditch is conveyed to the Manoa Stream via one of the five main drainage systems located within Central Campus, which the DMP denotes as Existing Drainage System ‘A’. More information regarding Existing Drainage System ‘A’ provided in the following Central Campus section.

There is also an existing CRM ditch that runs along the mauka side of Maile Way. Offsite runoff captured by the CRM ditch is discharged to the Manoa Stream via one of the five main drainage systems located within Central Campus, which the DMP denotes as Existing Drainage System ‘B’. More information regarding Existing Drainage System ‘B’ provided in the following Central Campus section.

Runoff from rainfall on the makai portion of Upper Central Campus generally sheet flows from mauka to makai where it is collected by Existing Drainage System ‘C’. More information regarding Existing Drainage System ‘C’ provided in the following Central Campus section.

Mauka Campus

Runoff from rainfall on the Mauka Campus is collected by a series of drain inlets and is conveyed to the CCH drainage system, which consists of drain inlets, drain manholes, vegetated ditches, box drains, and drain lines that vary in size from 18- to 54-inches. Runoff from the Mauka Campus then discharges to the Mid-Pacific Institute Ditch, which runs along the ʻEwa side of Upper Central Campus and is CCH owned. From the ditch, runoff is conveyed to the Mānoa Stream via one of the main drainage systems, identified as Existing System ‘A’ in the DMP. More information regarding Existing Drainage System ‘A’ provided in the following Central Campus section. The remaining areas drain to Woodlawn Drive, where runoff sheet flows to catch basins maintained by the CCH drainage system.

According to the DMP analysis, the City drainage system within Woodlawn Drive which consists of a network of 12-inch drain lines and drainage structures, does not have adequate capacity to convey a 10-year storm event. All overflow is sheet flows directly to Manoa Stream.

Table 3-31 below summarizes the various projects under the Proposed Action and the adjacent drainage infrastructure that would serve the subject project.

Table 3-31 Existing Drainage Systems

Campus Portion	LRDP Project	Private UH-Owned System	CCH System
Lower Campus	Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion	Existing System ‘M’	
	ROTC Facility	Existing System ‘L’	
	Zone 2 – Fiscal Management Portable Building Demolition	Existing System ‘L’	
Central Campus	Student Success Center: Sinclair Library Renovation	Existing System ‘E’	
	Mini Master Plan Phase 2 (Snyder Hall Replacement and Varney Circle Improvements)	Existing System ‘D’ Existing System ‘E’	Existing System ‘B’
	Hamilton Library Renovation		Existing System ‘B’
	Kuykendall Hall Renovation	Existing System ‘D’	
	Keller Hall Renovation		Existing System ‘B’
	Holmes Hall Renovation	Existing System ‘D’	

	Lincoln Hall Annex Portable Building Demolition	Existing System 'C'	
	Zone 1- Administrative Zone Portable Building Demolition	Existing System 'E'	
	Zone 4 – UH Lab School Portable Building Demolition	Existing System 'E'	24-Inch Drain Line (Metcalf Street) 36-Inch Drain Line (University Avenue)
	Mixed-Use Affordable Housing P3 Project		Existing System 'E'
	Innovation Center P3 Project	Existing System 'E'	18- and 36-Inch Drain Line (University Avenue)
Upper Central Campus	Central Traffic Center	Existing System 'C'	
	Central Administration Facility	Existing System 'C'	
	Zone 3 – Transportation/Facilities Services Portable Building Demolition		Existing System 'A' MPI Ditch
Mauka Campus	Zone 5 – UH Press Portable Building Demolition		Existing System 'A' MPI Ditch

Impacts and Mitigation Measures

In general, the UHM campus is fully developed with structures and impervious surfaces. Consequently, it is expected that any increase in storm water runoff peak discharge rate due to the Proposed Action will be minimal in comparison to those exhibited under the existing conditions. Drainage runoff rates and improvements for the various project under the Proposed Action shall be determined based on the CCH DPP, Storm Drainage Standards, dated August 2017. Any increase in runoff due to the Proposed Action will need to be retained on-site to ensure that the subject project will not have any adverse effects on downstream properties. For the New Construction/Replacement of Existing Structures (Net Increase) Projects, the project site shall be graded to provide positive drainage for storm water runoff to flow towards onsite drain inlets throughout the site. Proposed onsite storm drainage improvements will consist of a system of drain inlets, drain manholes, and underground piping to connect to the adjacent existing drainage system. The DMP calculated the peak flows for each drainage system that serve the UHM Campus for the Proposed Action. Table 3-32 below presents the peak flows for the Central Campus for the 10-year, 50-year, and 100-year storms:

Table 3-32 Summary of Proposed Flow to UH Manoa Drain Systems – Central Campus

Drainage System	Description	Existing				Proposed			
		Tributary Area [1] (ac.)	Q-10 yr (cfs)	Q-50 yr (cfs)	Q-100 yr (cfs)	Tributary Area [1] (ac.)	Q-10 yr (cfs)	Q-50 yr (cfs)	Q-100 yr (cfs)
A	Relief drain connecting to the bottom right corner of Mid-Pac ditch	52.0	144.6	-	-	23.8	84.9	-	-
B [2]	Main running through the middle of Central Campus	316.4	-	-	390.59	292.5	-	-	285.0

C	Large branch of Drain Line 'B' runs along the east side of Central Study Area	28.8	129.2	-	-	5.0	23.3	-	-
D	Large Branch of Drain Line 'E' running through central Study Area past campus Center to Saunders Hall	18.5	85.5	-	-	1.3	6.7	-	-
E	Main running along university Avenue and Dole Street	55.3	267.8	-	-	55.3	277.8	-	-
Relief Drain A	Large Drain intercepting offsite flow to Upper Central Study Area and a majority of Drainage System 'C'. Aligned between Mauka Study Area and St. Francis School	-	-	-	-	51.6	185.4	-	-
Relief Drain B	Large relief drain that intercepts flow from Drainage System 'E' and Drainage System 'D', diverting it near the outlet for Drainage System 'B'	-	-	-	-	30.1	149.2	-	-

Table 3-33 below presents peak flow for the Lower Campus:

Table 3-33 Summary of Proposed Flow to UH Manoa Drain Systems – Makai Study Area

Drainage System	Description	Existing				Proposed			
		Tributary Area [1] (ac.)	Q-10 yr (cfs)	Q-50 yr (cfs)	Q-100 yr (cfs)	Tributary Area [1] (ac.)	Q-10 yr (cfs)	Q-50 yr (cfs)	Q-100 yr (cfs)
L	Main system serving the Lower Campus	65.7	240.2	288.2	-	65.7	240.3	-	317.2
M	Large branch connecting to Drainage System 'L'	17.3	55.9	67.1	-	17.3	55.9	-	73.8

The Proposed Action and associated land disturbing activities have the potential impact water quality unless appropriate best management practices as required by the CCH are implemented. Improvements for each project will be required to comply with the CCH's Rules Relating to Water Quality, amended September 2018. Under these rules, the CCH has categorized new development and redevelopment including any incremental development into Priority Projects.

Priority Project 'A' is defined as "All new development and redevelopment including any incremental development that proposes land disturbing activities of land of one (1) acre or more."

Priority Project 'B1' is defined as any new development and redevelopment project that results in 5,000 SF or greater of impervious surface area that may have significant water quality impacts due to its location or associated land use activities, including but not limited to the Development or redevelopment of:

- Retail gas outlets
- Automotive repair shops
- Restaurants
- Parking lots with 20 stalls or more
- Buildings greater than 100 feet in height
- Retail malls
- Facilities used or zoned for industrial use.

Priority A and B1 projects are required (unless determined to be infeasible) to:

- Incorporate appropriate Low Impact Development (LID) site design strategies to the “maximum extent practicable” (MEP).

- Incorporate appropriate Source Control BMPs to the MEP.

- Retain on-site by infiltration, evapotranspiration, or harvest/reuse as much of the water quality volume (WQV) as feasible with appropriate LID Retention Post-Construction Treatment Control BMPs.

- Biofilter any portion of the WQV that is not retained on-site with appropriate LID Biofiltration Post-Construction Treatment Control BMPs.

If it is determined to be infeasible to retain and/or biofilter the Water Quality Volume, the CCH rules require the subject project to:

- Treat (by detention, filtration, settling, or vortex separation) and discharge with appropriate Alternative Compliance Post-Construction Treatment Control BMPs, any portion of the WQV that is not retained on-site or biofiltered.

- Retain or biofilter at an offsite location, the volume of runoff from a non-tributary drainage area equivalent to the difference between the project’s WQV and the amount retained on-site or biofiltered.

Appropriate best management practices measures include but are not limited to: infiltration basins and trenches, subsurface infiltration systems, dry wells, bioretention basins, permeable pavement, green roofs, vegetated bio-filters, enhanced swales, detention basins, sand filters, vegetated swales and buffer strips.

The DMP hydraulic analyses indicates that existing drain systems serving the UHM campus are largely inadequate based on the CCH’s standards. Drainage improvements identified in the DMP to address the inadequacies and bring the on-campus drainage systems into conformance with the CCH standards are outlined below. However, as noted in the DMP, due to the inadequacy of offsite drainage systems upstream of the UHM campus, the drain systems serving the campus seem to operate satisfactorily and therefore, are not considered essential projects at this time.

Lower Campus

No new drainage improvements to the Lower Campus are proposed, as all overflow is expected to sheet flow to the sump area makai of the Les Murakami Stadium.

The final line sizes and drainage structure locations will be determined during the design phase and shall maintain the existing discharge points to Mānoa Stream and the various CCH drainage systems. As required by the Storm Drainage Standards, projects which are categorized as Priority Projects will need to incorporate storm water quality measures with proposed drainage improvements as necessary.

Central Campus and Upper Central Campus

The DMP proposes the following drainage improvements to the Upper Central and Central Campus drainage systems:

Relief Drain 'A' – Improvements to Drainage System 'A' which will intercept offsite flows mauka of Woodlawn Drive and from the old Saint Francis School property. Relief Drain 'A' consists of new drain lines sized for the 100-year storm even varying from 36- to 72-inches running along East-West Road and along the property boundary near the old Saint Francis School. Relief Drain 'A', will connect to the existing Mid-Pacific Institute Ditch and eventually discharge to Mānoa Stream near the Hale Laulima. As such, the development of Relief Drain 'A' is intended to reduce the amount of runoff discharging to Existing Drainage Systems 'A', 'B', and 'C'.

Relief Drain 'B' – Improvements to Drainage System 'D' and 'E' which will divert flows from University Avenue and Central Campus to provide relief to all existing main drain systems mauka of Dole Street. Relief Drain 'B' consists of new drain lines that vary in size from 18- to 72-inches which will run throughout the Central Campus and eventually tie into the 96-inch drain line as part of Existing Drainage System 'E'.

Project 'C' – Improvements to Drainage System 'B' which include either the enlargement of drain lines or the installation of additional drain lines along portions of Maile Way.

Project 'D' – Improvements to Drainage System 'E' which include installing additional pipes to the system on the 'Ewa-side of Sinclair Library and raising the two manholes within the lawn on the 'Ewa-side of Bachman Hall by 1-foot to provide sufficient freeboard within the system.

Project 'E' – Improvements to Drainage System 'C' which will divert flow from the undersized system along East-West Road to Drain System 'A'. Improvements include the addition of a 36-inch drain line near Lincoln Hall that connects the system to Existing Drainage System 'A'. Drain System 'A', is intended to have sufficient capacity to accommodate the additional runoff after the installation of Relief Drain 'A'.

100-Year Drain Improvements – Installation of a 100-year relief drain, which will connect the existing MPI Ditch to Manoa Stream near Hale Mānoa. The 100-year relief drain improvements consists of installation of a 13-ft wide by 7-ft high concrete ditch that runs along the mauka side of Maile Way and a 8-ft x 11-ft' box drain along East-West Road.

Mauka Campus

No specific drainage improvements for the Mauka Campus are proposed however, the DMP suggests that future developments incorporate ways to reduce storm water flows to Woodlawn Drive. Long-term drain system improvements to mitigate the effects of a 100-year flood include the following:

100-Year Drain Improvements – Improvements at the Tropical Agriculture Facility on Woodlawn which include installation of a driveway and box culvert to divert runoff flowing to the Woodlawn Drive Bridge and the UHM Campus towards Mānoa Stream. The driveway serve as a drainage channel sloped toward Mānoa Stream, and consists of a 50-ft wide section, with an 11-ft x 5-ft box culvert beneath.

3.16.4 Electrical and Communications System

Electrical power on the island of O‘ahu is provided by Hawaiian Electric Company (HECO). A significant electrical source for the UHM campus is the Downtown Power Plant.

Telephone service in the area is provided by Hawaiian Telcom.

Spectrum is the local CATV provider in the region.

Impacts and Mitigation Measures

In the short- and long-term, the proposed project is not anticipated to impact or increase overall demand on electrical and communication systems in the area.

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Chapter 4:

Relationship to Plans, Policies, and Controls

CHAPTER 4: RELATIONSHIP TO PLANS, POLICIES AND CONTROLS

4. RELATIONSHIP TO PLANS, POLICIES, AND CONTROLS

Pursuant to Section 11-200.1-24, HAR, Chapter 4 describes the relationship of the Proposed Action to various "*land use and natural or cultural resource plans, policies, and controls for the affected area*." This Chapter discusses how the Proposed Action "*may conform or conflict with objectives and specific terms of approved or proposed land use and resource plans, policies, and controls, if any, for the affected area."* Where a conflict or inconsistency exists, described is the extent to which the Proposed Action has been reconciled *"with the plan, policy, or control, and the reasons why*" the proposing agency (DAGS) *"…has decided to proceed, notwithstanding the absence of full reconciliation."*

To facilitate describing the relationships of the Proposed Action to the numerous land use and natural or cultural resource plans, policies, and controls for the affected area, some of those plans, policies, and controls are presented in tabular form, and are described with text and/or the following letter code:

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

4.1. State Land Use Plans and Policies

4.1.1. Hawai‘i State Plan

The Hawai‘i State Plan, Chapter 226, HRS, as amended, provides goals, objectives, policies, and priorities for the State. The purpose of the Hawai‘i State Plan is to set forth a plan that shall serve as a guide for the future long-range development of the State; identify the goals, allocating limited resources, such as public funds, services, human resources, land, energy, water, and other resources; improve coordination of Federal, State, and County plans, policies, programs, projects, and regulatory activities; and, to establish a system for plan formulation and program coordination to provide for an integration of all major State, and County activities. The State Plan is divided into three sections. Part 1 is Overall Theme, Goals, Objectives and Policies. Part 2 is Planning Coordination and Implementation. Part 3 is Priority Guidelines. The Proposed Action's consistency with applicable goals, objectives and policies of Part 1 is discussed in Table 4-1, and an assessment of conformance with Part 3 is discussed in Table 4-2. Part 2 of the State Plan, which primarily covers internal government affairs, is not related to the Proposed Action.

Table 4-1: The Hawai‘i State Plan	S	NS	N/A
§226-4 State goals. In order to ensure, for 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:			
(1) A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawai‘i's present and future generations.	**X**		
(2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.	**X**		

Table 4-1: The Hawai'i State Plan	S	NS	N/A
(3) 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		
Discussion: The Proposed Action will assist State of Hawai'i in achieving its goals for a viable economy, a desired physical environment, and provides physical, social, and economic well-being for individual and families in Hawai'i. The Proposed Action will create construction jobs to implement the various LRDP projects. Moreover, the UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retains current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers. In turn, the UHM students will enter the State's workforce and contribute to the overall economy for future generations. As it relates to the physical environment, the UHM's landscape is one of its most valuable and distinctive attributes, the UHM's goal is to celebrate its unique natural assets and reduce impervious surfaces. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources. One of the UHM's goals is to create a living campus that supports community and student well-being. This will include services for students, staff, and faculty as well as members of the local community, and a long-term emphasis on encouraging development of student and faculty housing on and near campus. Leveraging the UHM campus as a program opportunity would allow the UH to invest in the quality of campus life and citizenship which also means investing in a range of recreation opportunities including everything from the lo'i space, athletic fields, to hiking trails and outdoor eating spaces. Creating key areas and zones that serve the wider public as well as the immediate campus community will serve to heighten regional appreciation and awareness of UHM's research pursuits and increase the UH's civic value for decades to come. Moreover, The UH also intends to create vibrant gathering spaces that can be the foundation of the UHM campus development. This includes supporting gathering spaces at all scales – formal and informal, and indoor and outdoor.			
§226-5 Objectives and policies for population. (a) 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. To achieve the population objective, it shall be the policy of this State to:			
(1) 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
(2) Encourage an increase in economic activities and employment opportunities on the Neighbor Islands consistent with community needs and desires.			X
(3) Promote increased opportunities for Hawai'i's people to pursue their socio-economic aspirations throughout the islands.	X		
(4) Encourage research activities and public awareness programs to foster an understanding of Hawai'i's limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawai'i's population.	X		

Table 4-1: The Hawai‘i State Plan	S	NS	N/A
(5) Encourage federal actions that will promote a more balanced distribution of immigrants among the states, provided that such actions do not prevent the reunion of immediate family members.			X
(6) Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state's population.			X
(7) Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.			X
Discussion: The Proposed Action will support the objectives and policies of the State with regards to population. The UHM is the largest and oldest of the ten campuses within the overall UH system. The UHM offers hundreds of undergraduate, graduate, doctoral, and professional degree programs. The UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The UHM also provides 21 National Collegiate Athletic Association (NCAA) Division I athletic programs with approximately 450 student athletes competing on men’s, women’s, and co-ed varsity teams. The UHM has been widely recognized as a world-class university providing affordable, quality higher education to the people of Hawai‘i and for conducting pioneering research to address critical issues facing the State. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retains current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers. Moreover, the Proposed Action will also provide much needed facilities to support the various programs offered at the UHM which will provide students the opportunity to be successful academically and professionally to pursue their socio-economic aspirations.			
§226-6 Objectives and policies for the economy--in general. (a) Planning for the State's economy in general shall be directed toward achievement of the following objectives: (1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai‘i’s people. (2) A steady 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. (b) To achieve the general economic objectives, it shall be the policy of this State to:			
(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 Hawaii.	X		
(6) Seek broader outlets for new or expanded Hawai‘i business investments.			X

Table 4-1: The Hawai‘i State Plan	S	NS	N/A
(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 Hawaii.	X		
(13) Foster greater cooperation and coordination between the public 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 non-discrimination 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
(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

Discussion: The Proposed Action will support the objectives and policies of the State for the economy – in general.

Implementing the Proposed Action will result in construction related expenditures which will provide positive benefits on the local economy. These benefits would be derived from the creation of construction and construction support jobs as well as revenues generated by the procurement of building supplies and materials.

The Proposed Action also results in the development of the Innovation Center P3 Project which will create a world-class student housing, innovation and classroom complex, currently unavailable on the UHM Campus. The Innovation Center P3 Project that will strengthen community assets and facilitate economic growth for UH, as well as the State.

Table 4-1: The Hawai'i State Plan	S	NS	N/A
The academic programming and research support that will be offered at the Innovation Center P3 has the potential to both: a) develop a much needed third major economic sector for the State of Hawai'i, that will be able to create high-quality living- wage jobs, and b) prepare students to address the challenges and opportunities faced by Hawai'i, and the world, in a quickly evolving digital century. Moreover, as mentioned before, the academic and research programming offered at the UHM will continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution and provide students the opportunity to be successful academically and professionally, which will in turn benefit that State's economy as students join the State's workforce.			
§226-7 Objectives and policies for the economy--agriculture. (a) Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives: (1) Viability of Hawaii's sugar and pineapple industries. (2) Growth and development of diversified agriculture throughout the State. (3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being To achieve the agriculture objectives, it shall be the policy of this State to:			
(1) Establish a clear direction for Hawaii's agriculture through stakeholder commitment and advocacy.			X
(2) Encourage agriculture by making the 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
(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 Hawai'i'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

Table 4-1: The Hawai‘i State Plan	S	NS	N/A
(13) Promote economically competitive activities that increase Hawai‘i's agricultural self-sufficiency, including the increased purchase and use of Hawaii-grown food and food products by residents, businesses, and governmental bodies as defined under section 103D-104.			X
(14) Promote and assist in the establishment of sound financial programs for diversified agriculture			X
(15) Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.			X
(16) Facilitate the transition of agricultural lands in economically non-feasible agricultural production to economically viable agricultural uses.			X
(17) Perpetuate, promote, and increase use of traditional Hawaiian farming systems, such as the use of loko i‘a, māla, and irrigated lo‘i, and growth of traditional Hawaiian crops, such as kalo, ‘uala, and ‘ulu.			X
(18) Increase and develop small-scale farms.			X
Discussion: The Proposed Action will support the objectives and policies of the economy as it relates to agriculture. The UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retains current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers. In turn, the UHM students will enter the State’s workforce and contribute to the overall economy for future generations.			
226-8 Objective and policies for the economy--visitor industry. (a) 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 Hawai‘i's economy. (b) To achieve the visitor industry objective, it shall be the policy of this State to:			
(1) Support and assist in the promotion of Hawai‘i'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 Hawai‘i'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 between the public and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.			X
(5) Develop the industry in a manner that will continue to provide new job opportunities and steady employment for 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

Table 4-1: The Hawai‘i State Plan	S	NS	N/A
Discussion: The Proposed Action will support the objectives and policies of the State for the economy as it relates to visitor industry. The Proposed Action will allow the UHM to provide much needed facilities to support the various programs offered at the UHM which will provide students the opportunity to be successful academically and professionally to pursue their socio-economic aspirations, including those within the Travel Industry Management programs offered at the UHM.			
§226 9 Objective and policies for the economy--federal expenditures. (a) 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) To achieve the federal expenditures objective, it shall be the policy of this State to:			
(1) Encourage the sustained flow of federal expenditures in Hawai‘i that generates long-term government civilian employment.			X
(2) Promote Hawaii's supportive role in national defense, in a manner consistent with Hawaii's social, environmental, and cultural goals by building upon dual-use and defense applications to develop thriving ocean engineering, aerospace research and development, and related dual-use technology sectors in Hawaii's economy.			X
(3) Promote the development of federally supported activities in Hawai‘i that respect statewide 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
Discussion: The Proposed Action will support the economy related to federal expenditures. The Proposed Action will allow the UHM to provide much needed facilities to support the various programs offered at the UHM which will provide students the opportunity to be successful academically and professionally to pursue their socio-economic aspirations, including those seeking federal jobs.			
§226-10 Objective and policies for the economy--potential growth and innovative activities. (a) 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. (b) To achieve the potential growth activity objective, it shall be the policy of this State to:			
(1) Facilitate investment and employment growth in economic activities that have the potential to expand and diversify Hawaii's economy, including but not limited to	X		

Table 4-1: The Hawai‘i State Plan	S	NS	N/A
diversified agriculture, aquaculture, renewable energy development, creative media, health care, and science and technology-based sectors.			
(2) Facilitate investment in innovative activity that may pose risks or be less labor-intensive than other traditional business activity, but if successful, will generate revenue in Hawai‘i through the export of services or products or substitution of imported services or products.	X		
(3) Encourage entrepreneurship in innovative activity by academic researchers and instructors who may not have the background, skill, or initial inclination to commercially exploit their discoveries or achievements.	X		
(4) Recognize that innovative activity is not exclusively dependent upon individuals with advanced formal education, but that many self-taught, motivated individuals are able, willing, sufficiently knowledgeable, and equipped with the attitude necessary to undertake innovative activity.			X
(5) Increase the opportunities for investors in innovative activity and talent engaged in innovative activity to personally meet and interact at cultural, art, entertainment, culinary, athletic, or visitor-oriented events without a business focus.	X		
(6) Expand Hawai‘i's capacity to attract and service international programs and activities that generate employment for Hawai‘i's people.	X		
(7) Enhance and promote Hawai‘i's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts.	X		
(8) Accelerate research and development of new energy-related industries based on wind, solar, ocean, and underground resources and solid waste.	X		
(9) Promote Hawai‘i's geographic, environmental, social, and technological advantages to attract new economic activities into the State.	X		
(10) Provide public incentives and encourage private initiative to attract new industries that best support Hawai‘i's social, economic, physical, and environmental objectives.	X		
(11) Increase research and the development of ocean related economic activities such as mining, food production, and scientific research.			X
(12) Develop, promote, and support research and educational and training programs that will enhance Hawai‘i's ability to attract and develop economic activities of benefit to Hawai‘i.	X		
(13) Foster a broader public recognition and understanding of the potential benefits of new, 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 Hawaii's social, economic, physical, and environmental objectives.			X
(15) Increase research and development of businesses and services in the telecommunications and information industries.	X		
(16) Foster the research and development of nonfossil fuel and energy efficient modes of transportation	X		
(17) Recognize and promote health care and health care information technology as growth industries.			X
Discussion: The Proposed Action will support the economy related to potential growth and innovative activities.			

Table 4-1: The Hawai'i State Plan	S	NS	N/A
The Proposed Action also results in the development of the Innovation Center P3 Project which will create a world-class student housing, innovation and classroom complex, currently unavailable on the UHM Campus. The Innovation Center P3 Project that will strengthen community assets and facilitate economic growth for UH, as well as the State. The academic programming and research support that will be offered at the Innovation Center P3 Project has the potential to both: a) develop a much needed third major economic sector for the State of Hawai'i, that will be able to create high-quality living- wage jobs, and b) prepare students to address the challenges and opportunities faced by Hawai'i, and the world, in a quickly evolving digital century. Participants will have access to educational programs provided by the Innovation Center P3 Project which also includes free advice by experienced mentors, startup funds, free to low-cost office space, and access to entrepreneurial interns. The academic programs planned for the Innovation Center would support three phases of the startup process including Ideation, Acceleration, and Incubation. Generally speaking, in the long-term, the Proposed Action will provide significant opportunities for the incubation and development of commercial high-technology-centered start-ups and businesses ventures which may potentially generate jobs in specialized fields otherwise not-common here in the islands. Moreover, as mentioned before, the academic and research programming offered at the UHM will continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution and provide students the opportunity to be successful academically and professionally, which will in turn provide opportunities for potential growth.			
226-10.5 Objectives and policies for the economy--information industry. (a) 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. (b) To achieve the information industry objective, it shall be the policy of this State to:			
(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 Hawaii			**X**
(2) Encourage the continued development and expansion of the telecommunications infrastructure serving Hawai'i to accommodate future growth and innovation in Hawaii's economy.			**X**
(3) Facilitate the development of new or innovative business and service ventures in the information industry which will provide employment opportunities for the people of Hawaii.	**X**		
(4) Encourage mainland- and foreign-based companies of all sizes, whether information technology-focused or not, to allow their principals, employees, or contractors to live in and work from Hawaii, using technology to 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 Hawaii's people.	**X**		
(7) Provide opportunities for Hawaii's people to obtain job training and education that will allow for upward mobility within the information industry.	**X**		

Table 4-1: The Hawai‘i State Plan	S	NS	N/A
(8) Foster a recognition of the contribution of the information industry to Hawaii's economy.	X		
(9) Assist in the promotion of Hawai‘i as a broker, creator, and processor of information in the Pacific**.**			X
Discussion: The Proposed Action will support the economy relating to telecommunications and information technology industries. The UH also intends to create vibrant gathering spaces that can be the foundation of the UHM campus development. This includes supporting gathering spaces at all scales – formal and informal, and indoor and outdoor. Also envisioned is embedding digital capabilities (digital learning) into the gathering space experience including but not limited to, Wifi, Digital screens, and Dynamic lighting; and integrating international connections by hosting international gathering events, as well as integrating the local community into campus learning and cultural events. Pathways are twofold creating compelling public spaces for gathering and spontaneous interactions. Gathering spaces are designed to be flexible, serving multiple programmatic uses & demographics. Moreover, as mentioned before, the academic and research programming offered at the UHM will continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution and provide students the opportunity to be successful academically and professionally, including those within the Information Technologies programs at UHM.			
§226-11 Objectives and policies for the physical environment--land-based, shoreline, and marine resources. (a) The land-based, shoreline, and marine resources objectives are: (1) Prudent use of Hawai‘i's land-based, shoreline, and marine resources. (2) Effective protection of Hawai‘i's unique and fragile environmental resources. (b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:			
(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
Discussion: The Proposed Action will support the objective and policies for the physical environment – land-based, shoreline, and marine resources.			

Table 4-1: The Hawai'i State Plan	S	NS	N/A
Given that the UHM campus' landscape is one of its most valuable and distinctive attributes, the UHM's goal is to celebrate its unique natural assets and reduce impervious surfaces. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources. The UHM also seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. This will in turn benefit the natural resources in the region Moreover, no short- or long-term significant impacts on surface and/or coastal waters in the project vicinity are anticipated to result from the construction and operation of the Proposed Action. Construction of the projects under the Proposed Action is not anticipated to involve major land disturbing activities. Applicable erosion control measures and best management practices will be implemented to mitigate any possible adverse effects relating to runoff. As applicable for each phase, these may include but are not limited to temporary sediment basins, temporary diversion berms and swales to intercept runoff, silt fences, dust fences, slope protection, stabilized construction vehicle entrance, grate inlet protection, equipment wash down areas, and use of compost filter socks. Coordination will be undertaken with the appropriate agencies during permitting and construction in order to ensure that the Proposed Action will not result in significant impacts with regard to surface water. Soil disturbances in excess of one acre would require an NPDES Individual Permit for stormwater associated with construction activity, administered by the State DOH, will be required to control stormwater discharges. Any discharges related to project construction or operation activities will comply with applicable State Water Quality Standards as specified in, Chapter 11-54 and 11-55, HAR, Water Pollution Control. Excavation and grading activities will be regulated by applicable provisions of the County's grading ordinance. There is the potential that several native and special status species may overfly or occur at the UHM campus during nesting seasons However, applicable measures to prevent adverse effects to special status species should be implemented.			
§226-12 Objective and policies for the physical environment--scenic, natural beauty, and historic resources. (a) 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 (b) To achieve the scenic, natural beauty, and historic resources objective, it shall be the policy of this State to:			
(1) Promote the preservation and restoration of significant natural and historic resources.	**X**		
(2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities.			**X**
(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.	**X**		
(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawai'i's ethnic and cultural heritage.	**X**		
(5) Encourage the design of developments and activities that complement the natural beauty of the islands.	**X**		
Discussion: The Proposed Action will support the objectives and policies for the physical environment relating to scenic, natural beauty, and historic resources.			

Table 4-1: The Hawai'i State Plan	S	NS	N/A
Given that the UHM campus' landscape is one of its most valuable and distinctive attributes, the UHM's goal is to celebrate its unique natural assets and reduce impervious surfaces. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources.			
§226-13 Objectives and policies for the physical environment--land, air, and water quality. (a) Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives: (1) Maintenance and pursuit of improved quality in Hawai'i's land, air, and water resources. (2) Greater public awareness and appreciation of Hawai'i's environmental resources. (b) To achieve the land, air, and water quality objectives, it shall be the policy of this State to:			
(1) Foster educational activities that promote a better understanding of Hawai'i's limited environmental resources.	X		
(2) Promote the proper management of Hawai'i's land and water resources.			X
(3) Promote effective measures to achieve desired quality in Hawai'i's surface, ground, and coastal waters.			X
(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai'i's people.	X		
(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.			X
(6) Encourage design and construction practices that enhance the physical qualities of 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		
Discussion: The Proposed Action supports the objectives and policies related to the physical environment for land, air, and water quality. The UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retain current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers. In turn, the UHM students will enter the State's workforce and contribute to fields and industries related to natural resource management for future generations. Moreover, as mentioned before, the UHM campus' landscape is one of its most valuable and distinctive attributes, the UHM's goal is to celebrate its unique natural assets and reduce impervious surfaces. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources.			

Table 4-1: The Hawai'i State Plan	S	NS	N/A
The UHM also seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. This will in turn benefit the overall air quality in the State as the UHM campus would be emitting less GHG emissions.			
§226-14 Objective and policies for facility systems--in general. (a) Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives. (b) To achieve the general facility systems objective, it shall be the policy of this State to :			
(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**
Discussion: The Proposed Action supports the objectives and policies for facility systems in general. The Proposed Action is essentially a list of the UHM's CIP projects to address current facility needs for the UH moving forward over the next 5-10 years. Moreover, the UHM is seeking to reach carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness through its LRDP.			
§226-15 Objectives and policies for facility systems—solid and liquid wastes. (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: (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 of physical and economic activities that alleviate problems in housing, employment, mobility, and other areas. (c) To achieve solid and liquid waste objectives, it shall be the policy of this State to:			
(1) Encourage the adequate development of sewerage facilities that complement planned growth.	**X**		
(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.	**X**		
(3) Promote research to develop more efficient and economical treatment and disposals of solid and liquid wastes.			**X**
Discussion: The Proposed Action will support the policies that involve facility systems related to solid and liquid wastes. It is anticipated that the existing wastewater systems will be improved due to the Proposed Action as noted by the Sewer Master Plan included herein as Appendix B and discussed in Section 3.16.2.			

Table 4-1: The Hawai'i State Plan	S	NS	N/A
Regarding solid waste, it is anticipated that in the short-term construction and development to the proposed improvements will generate solid waste. However, the solid waste generated during construction will be properly disposed of in municipal solid waste collection sites and is not anticipated to generate a demand that would burden the local municipal waste collection. Additionally, the UHM campus is committed to working toward sustainability and reducing the campus environmental footprint by reaching carbon neutrality by the year 2050.			
§226-16 Objective and policies for facility systems--water. (a) Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities. (b) To achieve the facility systems water objective, it shall be the policy of the State to:			
(1) Coordinate development of land use activities with existing and potential water supply.	X		
(2) Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.			X
(3) Reclaim and encourage the productive use of runoff water and waste water discharges.			X
(4) Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.			X
(5) Support water supply services to areas experiencing critical water problems.			X
(6) Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.			X
Discussion: The Proposed Action will support the objectives and policies for facility systems related to water. The Proposed Action is anticipated to require water system improvements for the Central Campus portion of the UHM which will be coordinated with the appropriate agencies. Other portions of the UHM campus will not require improvement to the existing water system as noted in Section 3.16.1.			
§226-17 Objectives and policies for facility systems--transportation. (a) Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives: (1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods. (2) A statewide transportation system consistent with planned growth objectives throughout the State (b) To achieve the transportation objectives, it shall be the policy of this State to:			
(1) Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter.	X		
(2) Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives.	X		
(3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties.			X

Table 4-1: The Hawai'i State Plan	S	NS	N/A
(4) Provide for improved accessibility to shipping, docking, and storage facilities.			X
(5) Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs.			X
(6) Encourage transportation systems that serve to accommodate present and future development needs of communities.	X		
(7) Encourage a variety of carriers to offer increased opportunities and advantages to inter-island movement of people and goods.			X
(8) Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs.			X
(9) Encourage the development of transportation, systems and programs which would assist statewide economic growth and diversification.			X
(10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawai'i's natural environment.			X
(11) Encourage safe and convenient uses of low-cost, energy-efficient, non-polluting means of transportation.	X		
(12) Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives.			X
(13) Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.	X		

Discussion: The Proposed Action supports facility systems related to transportation.

The UHM is striving to transform from a commuter campus to a pedestrian-centered place of learning. To achieve this goal, the UHM intends to reduce parking accommodations; prioritize pedestrian pathways and wayfinding on the Central Campus; develop alternative transit solutions to one-driver-one-car such as a transit hub, developing an off-campus parking strategy, and anticipating future mobility changes; and create velocity-based on-campus hierarchy of circulation.

In the near-term, this will involve relocating parking and vehicular circulation from the core of the central campus to the periphery. In the long term, the University will develop, promote, and support alternatives to commuting via private vehicles, which may include ridesharing, enhanced public transit, an expanded UHM shuttle system, human-powered and motorized bicycles and scooters, autonomous vehicles, and the possible extension of rail to the UHM campus.

§226-18 Objectives and policies for facility systems—energy.

(a) Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all:

(1) Dependable, efficient, and economical statewide energy and telecommunication systems capable of supporting the needs of the people.

(2) Increased energy self-sufficiency through the reduction and ultimate elimination of Hawaii's dependence on imported fuels for electrical generation and ground transportation;

(3) Greater diversification of energy generation in the face of threats to Hawaii's energy supplies and systems;

(4) Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use; and

Table 4-1: The Hawai'i State Plan	S	NS	N/A
(5) Utility models that make the social and financial interests of Hawaii's utility customers a priority.. (b) To achieve the energy objectives, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable energy services to accommodate demand (c) To further achieve the energy objectives, it shall be the policy of this State to:			
(1) Support research and development as well as promote the use of renewable energy sources.	X		
(2) Ensure a sufficient supply of energy to enable power systems 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; (B) Education; (C) Adoption of energy-efficient practices and technologies; and (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 Hawaii's greenhouse gas emissions through agriculture and forestry initiatives.			X
(10) Provide priority handling and processing for all state and county permits required for renewable energy projects.			X
(11) Ensure that liquefied natural gas is used only as a cost-effective transitional, limited-term replacement of petroleum for electricity generation and does not impede the development and use of other cost-effective renewable energy sources.			X
(12) Promote the development of indigenous geothermal energy resources that are located on public trust land as an affordable and reliable source of firm power for Hawaii.			X
Discussion: The Proposed Action supports the objectives and policies for facility systems related to energy. The UHM also seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. This will in turn benefit the overall air quality in the State as the UHM campus would be emitting less GHG emissions.			

Table 4-1: The Hawai'i State Plan	S	NS	N/A
In order for the UHM to achieve its resiliency goals, all energy generated from the PV systems installed must be utilized (if the % Net Zero Energy is equal or less than 100%). As such, at any given time when the PV systems' energy production may exceed the campus' energy use, such excess energy must be stored. In such cases, energy storage system(s) must be incorporated onto the UHM electrical system to store such excess energy for use by the UHM campus at a later time (e.g., during peak shaving application or overnight energy use). The PV system installation will over phases, likely spanning several years. As such, the energy storage build-out would be designed to match the PV phased installation, installing energy storage only at such phase where it is either required to match the PV phased installation, installing energy, or becomes cost-beneficial due to a peak-demand or utility rate arbitrage scenario.			
§226-18.5 Objectives and policies for facility systems--telecommunications. (a) Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people. (b) To achieve the telecommunications objective, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable telecommunications services to accommodate demand. (c) To further achieve the telecommunications objective, it shall be the policy of this State to:			
(1) Facilitate research and development of telecommunication systems and resources.	**X**		
(2) Encourage public and private sector efforts to develop means for adequate, ongoing telecommunication planning.			**X**
(3) Promote efficient management and use of existing telecommunication systems and services.			**X**
(4) Facilitate the development of education and training of telecommunication personnel.	**X**		
Discussion: The Proposed Action will not involve facility systems related to telecommunications. The Proposed Action will allow the UHM to provide much needed facilities to support the various programs offered at the UHM which will provide students the opportunity to be successful academically and professionally to pursue their socio-economic aspirations, including those within communications program.			
§226-19 Objectives and policies for socio-cultural advancement--housing. (a) Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives: (1) Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more rental and for sale affordable housing is made available to extremely low-, very low-, lower-, moderate-, and above moderate-income segments of Hawaii's population. (2) The orderly development of residential areas sensitive to community needs and other land uses. (3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawaii's people. (b) To achieve the housing objectives, it shall be the policy of this State to:			
(1) Effectively accommodate the housing needs of Hawai'i's people.	**X**		

Table 4-1: The Hawai‘i State Plan	S	NS	N/A
(2) Stimulate and promote feasible approaches that increase affordable rental and for sale housing choices for extremely low-, very low-, lower-, moderate-, and above moderate-income households.			X
(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 cultures and values of the community.			X
(8) Promote research and development of methods to reduce the cost of housing construction in Hawai‘i.			X
Discussion: The Proposed Action will support the objectives and policies for socio-cultural advancement related to housing. The UH also intends to improve the overall facility portfolio effectiveness by developing larger, more efficient buildings; having higher density and more open space by concentrating academic activity on Central Campus; improving building occupancy and utilization by making building repairs and identifying buildings that need to be removed from the campus inventory; removing underutilized portables; and create land banks for a range of future uses such as housing, R&D spaces, and open space plazas. Moreover, findings from the 2017 Campus Experience Survey found that residential experiences were high on the list of factors that influence students’ perspectives of the campus. Thus, the UHM’s goal is to create a living campus that supports community and student well-being. This will include services for students, staff, and faculty as well as members of the local community, and a long-term emphasis on encouraging development of student and faculty housing on and near campus. Leveraging the UHM campus as a program opportunity would allow the UH to invest in the quality of campus life and citizenship which also means investing in a range of recreation opportunities including everything from the lo‘i space, athletic fields, to hiking trails and outdoor eating spaces. Creating key areas and zones that serve the wider public as well as the immediate campus community will serve to heighten regional appreciation and awareness of UHM’s research pursuits and increase the UH’s civic value for decades to come.			
§226-20 Objectives and policies for socio-cultural advancement--health. (a) 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. (2) Maintenance of sanitary and environmentally healthful conditions in Hawai‘i's communities. (3) Elimination of health disparities by identifying and addressing social determinants of health. (b) To achieve the health objectives, it shall be the policy of this State to:			
(1) Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.	X		

Table 4-1: The Hawai'i State Plan	S	NS	N/A
(2) Encourage improved cooperation among public and private sectors in the provision of health care to accommodate the total health needs of individuals throughout the State.			X
(3) Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care and related insurance costs.			X
(4) Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.			X
(5) Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.	X		
(6) Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring, and enforcement			X
(7) Prioritize programs, services, interventions, and activities that address identified social determinants of health to improve native Hawaiian health and well-being consistent with the United States Congress' declaration of policy as codified in title 42 United States Code section 11702, and to reduce health disparities of disproportionately affected demographics, including native Hawaiians, other Pacific Islanders, and Filipinos. The prioritization of affected demographic groups other than native Hawaiians may be reviewed every ten years and revised based on the best available epidemiological and public health data.			X
Discussion: The Proposed Action will support the objectives and policies for socio-cultural advancement regarding health. Under the Proposed Action the University Health Services building will be renovated to provide the existing programs and staff with the adequate space and use needs to continue to offer their wide range of services and programs for the UHM community. These generally include medical care by appointment or on a walk-in basis; women's health, sports medicine, psychiatry, dermatology, and nutrition clinics by appointment; pharmacy and clinical laboratory; and student training, employment and volunteer opportunities.			
§226-21 Objective and policies for socio-cultural advancement--education. (a) Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations. (b) To achieve the education objective, it shall be the policy of this State to:			
(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		
(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

Table 4-1: The Hawai'i State Plan	S	NS	N/A
(7) Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.			X
(8) Emphasize quality educational programs in Hawaii's institutions to promote academic excellence.	X		
(9) Support research programs and activities that enhance the education programs of the State.	X		
Discussion: The Proposed Action will support the objectives and policies of the State for the socio-cultural advancement regarding education. The UHM is the largest and oldest of the ten campuses within the overall UH system. The UHM offers hundreds of undergraduate, graduate, doctoral, and professional degree programs. The UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The UHM also provides 21 National Collegiate Athletic Association (NCAA) Division I athletic programs with approximately 450 student athletes competing on men's, women's, and co-ed varsity teams. The UHM has been widely recognized as a world-class university providing affordable, quality higher education to the people of Hawai'i and for conducting pioneering research to address critical issues facing the State. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retains current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers. Moreover, the Proposed Action will also provide much needed facilities to support the various programs offered at the UHM which will provide students the opportunity to be successful academically and professionally to pursue their socio-economic aspirations.			
§226-22 Objective and policies for socio-cultural advancement--social services. (a) Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being. (b) To achieve the social services objective, it shall be the policy of this State to:			
(1) Assist individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic hardship conditions, through social services and activities within the State's fiscal capacities.			X
(2) Promote coordination and integrative approaches among public and private agencies and programs to jointly address social problems that will enable individuals, families, and groups to deal effectively with social problems and to enhance their participation in society.			X
(3) Facilitate the adjustment of new residents, especially recently arrived immigrants, into Hawaii's communities			X
(4) Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.			X
(5) Support public and private efforts to prevent domestic abuse and child molestation, and assist victims of abuse and neglect.			X
(6) Promote programs which assist people in need of family planning services to enable them to meet their needs.			X
Discussion: The Proposed Action will not affect the objectives and policies for socio-cultural advancement related to social services.			
§226-23 Objective and policies for socio-cultural advancement--leisure.			

Table 4-1: The Hawai'i State Plan	S	NS	N/A
(a) Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations. (b) To achieve the leisure objective, it shall be the policy of this State to:			
(1) Foster and preserve Hawai'i's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.	X		
(2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.	X		
(3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.	X		
(4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved	X		
(5) Ensure opportunities for everyone to use and enjoy Hawai'i's recreational resources.			X
(6) Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs	X		
(7) Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawai'i's people.			X
(8) Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk, and traditional art forms.	X		
(9) Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawai'i's population to participate in the creative arts.			X
(10) Assure adequate access to significant natural and cultural resources in public ownership.			X
Discussion: The Proposed Action will support the objectives and policies for socio-cultural advancement related to leisure. The UHM's landscape is one of its most valuable and distinctive attributes, the UHM's goal is to celebrate its unique natural assets and reduce impervious surfaces. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources. One of the UHM's goals is to create a living campus that supports community and student well-being. This will include services for students, staff, and faculty as well as members of the local community, and a long-term emphasis on encouraging development of student and faculty housing on and near campus. Leveraging the UHM campus as a program opportunity would allow the UH to invest in the quality of campus life and citizenship which also means investing in a range of recreation opportunities including everything from the lo'i space, athletic fields, to hiking trails and outdoor eating spaces. Creating key areas and zones that serve the wider public as well as the immediate campus community will serve to heighten regional appreciation and awareness of UHM's research pursuits and increase the UH's civic value for decades to come. Moreover, The UH also intends to create vibrant gathering spaces that can be the foundation of the UHM campus development. This includes supporting gathering spaces at all scales – formal and informal, and indoor and outdoor.			
§**226-24 Objective and policies for socio-cultural advancement--individual rights and personal well-being.**			

Table 4-1: The Hawai'i State Plan	S	NS	N/A
(a) Planning for the State's socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations. (b) To achieve the individual rights and personal wellbeing objective, it shall be the policy of this State to:			
(1) Provide effective services and activities that protect individuals from criminal acts and unfair practices and that alleviate the consequences of criminal acts in order to foster a safe and secure environment.			X
(2) Uphold and protect the national and state constitutional rights of every individual.			X
(3) Assure access to, and availability of, legal assistance, consumer protection, and other public services which strive to attain social justice.			X
(4) Ensure equal opportunities for individual participation in society.			X
Discussion: The Proposed Action will not affect the objectives and policies for socio-cultural advancement related to individual rights and personal well-being.			
§226-25 Objective and policies for socio-cultural advancement--culture. (a) 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. (b) To achieve the culture objective, it shall be the policy of this State to:			
(1) Foster increased knowledge and understanding of Hawai'i's ethnic and cultural heritages and the history of Hawai'i.	X		
(2) Support activities and conditions that promote cultural values, customs, and arts that enrich the life styles of Hawai'i's people and which are sensitive and responsive to family and community needs.	X		
(3) Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community life styles in Hawai'i.			X
(4) Encourage the essence of the aloha spirit in people's daily-activities to promote harmonious relationships among Hawai'i's people and visitors.	X		
Discussion: The Proposed Action will support the objectives and policies for socio-cultural advancement related to culture. The UHM Framework that guides the Proposed Action has set the objective of leveraging unique attributes of place, seeking to honor indigenous ancestral traditions, embracing Native Hawaiian culture and knowledge systems, along with encouraging the spirit of aloha through promoting activities that teach individuals to care about each other and the natural environment.			
§226-26 Objectives and policies for socio-cultural advancement--public safety. (a) Planning for the State's socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives: (1) Assurance of public safety and adequate protection of life and property for all people. (2) Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances.			

Table 4-1: The Hawai'i State Plan	S	NS	N/A
(3) Promotion of a sense of community responsibility for the welfare and safety of Hawai'i's			
(b) To achieve the public safety programs objectives, it shall be the policy of this State to:			
(1) Ensure that public safety programs are effective and responsive to community needs.			X
(2) Encourage increased community awareness and participation in public safety programs.			X
(c) To achieve the public safety programs objectives, it shall be the policy of this State to:			
(1) Support criminal justice programs aimed at preventing and curtailing criminal activities.			X
(2) Develop a coordinated, systematic approach to criminal justice administration among all criminal justice agencies.			X
(3) Provide a range of correctional resources which may include facilities and alternatives to traditional incarceration in order to address the varied security needs of the community and successfully reintegrate offenders into the community.			X
(d) To further achieve public safety objectives related to emergency management, it shall be the policy of this State to:			
(1) Ensure that responsible organizations are in a proper state of readiness to respond to major war related, natural, or technological disasters and civil disturbances at all times.			X
(2) Enhance the coordination between emergency management programs throughout the State.			X
Discussion: The Proposed Action will not affect the objectives and policies for socio-cultural advancement related to public safety.			
§226-27 Objectives and policies for socio-cultural advancement--government.			
(a) 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.			
(b) To achieve the government objectives, it shall be the policy of this State to:			
(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
(5) Assure that government attitudes, actions, and services are sensitive to community needs and concerns.	X		
(6) Provide for a balanced fiscal budget.			X

Table 4-1: The Hawai‘i State Plan	S	NS	N/A
(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
Discussion: The Proposed Action will not directly affect the objectives and policies for socio-cultural advancement related to government. Comprehensive project messaging and public engagement will ensure that an open flow of communication with the public and stakeholders is maintained throughout the delivery process of the Proposed Action. This will ensure all concerns related to the Proposed Action are scoped and allow for the project to address any issues of the affected residents.			

PART III. PRIORITY GUIDELINES

Part III of the Hawai‘i State Plan establishes the overall priority guidelines to address areas of statewide concern. Under HRS § 226-102, "*The State shall strive to improve the quality of life for Hawai‘i's present and future population through the pursuit of desirable courses of action in seven major areas of Statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, quality education, principles of sustainability, and climate change adaptation*."

Table 4-2: Part III of the Hawai‘i State Plan	S	NS	N/A
§226-103 Economic priority guidelines. (a) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawai‘i’s people and achieve a stable and diversified economy:			
(1) Seek a variety of means to increase the availability of investment capital for new and expanding enterprises.			X
(2) Encourage the expansion of technological research to assist industry development and support the development and commercialization of technological advancements.	X		
(3) Improve the quality, accessibility, and range of services provided by government to business, including data and reference services and assistance in complying with governmental regulations.			X
(4) Seek to ensure that state business tax and labor laws and administrative policies are equitable, rational, and predictable.			X
(5) Streamline the building and development permit and review process, and eliminate or consolidate other burdensome or duplicative governmental requirements imposed on business, where public health, safety, and welfare would not be adversely affected.			X
(6) Encourage the formation of cooperatives and other favorable marketing or distribution arrangements at the regional or local level to assist Hawai‘i's small-scale producers, manufacturers, and distributors.			X
(7) Continue to seek legislation to protect Hawai‘i from transportation interruptions between Hawai‘i and the continental United States.			X
(8) Provide public incentives and encourage private initiative to develop and attract industries which promise long-term growth potentials and which have the following characteristics:			X

Table 4-2: Part III of the Hawai‘i State Plan	S	NS	N/A
(a) An industry that can take advantage of Hawai‘i's unique location and available physical and human resources. (b) A clean industry that would have minimal adverse effects on Hawai‘i's environment. (c) An industry that is willing to hire and train Hawai‘i's people to meet the industry's labor needs. (d) An industry that would provide reasonable income and steady employment.			
(9) Support and encourage, through educational and technical assistance programs and other means, expanded opportunities for employee ownership and participation in Hawai‘i business.	**X**		
(10) Enhance the quality of Hawai‘i’s labor force and develop and maintain career opportunities for Hawai‘i’s people through the following actions: (a) Expand vocational training in diversified agriculture, aquaculture, and other areas where growth is desired and feasible. (b) Encourage more effective career counseling and guidance in high schools and post-secondary institutions to inform students of present and future career opportunities. (c) Allocate educational resources to career areas where high employment is expected and where growth of new industries is desired. (d) Promote career opportunities in all industries for Hawai‘i's people by encouraging firms doing business in the State to hire residents. (e) Promote greater public and private sector cooperation in determining industrial training needs and in developing relevant curricula and on-the-job training opportunities. (f) Provide retraining programs and other support services to assist entry of displaced workers into alternative employment.			**X**
(b) Priority guidelines to promote the economic health and quality of the visitor industry:			
(1) Promote visitor satisfaction by fostering an environment which enhances the Aloha Spirit and minimizes inconveniences to Hawai‘i's residents and visitors.			**X**
(2) Encourage the development and maintenance of well-designed, adequately serviced hotels and resort destination areas which are sensitive to neighboring communities and activities and which provides for adequate shoreline setbacks and beach access.			**X**
(3) Support appropriate capital improvements to enhance the quality of existing resort destination areas and provide incentives to encourage investment in upgrading, repair, and maintenance of visitor facilities.			**X**
(4) Encourage visitor industry practices and activities which respect, preserve, and enhance Hawai‘i's significant natural, scenic, historic, and cultural resources.			**X**
(5) Develop and maintain career opportunities in the visitor industry for Hawai‘i's people, with emphasis on managerial positions.			**X**
(6) Support and coordinate tourism promotion abroad to enhance Hawai‘i's share of existing and potential visitor markets.			**X**
(7) Maintain and encourage a more favorable resort investment climate consistent with the objectives of this chapter.			**X**
(8) Support law enforcement activities that provide a safer environment for both visitors and residents alike.			**X**

Table 4-2: Part III of the Hawai‘i State Plan	S	NS	N/A
(c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:			
(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.			X
(2) Continue efforts to maintain federal support to provide stable sugar prices high enough to allow profitable operations in Hawai‘i.			X
(3) Support research and development, as appropriate, to improve the quality and production of sugar and pineapple crops.			X
(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:			
(1) Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.			X
(2) Assist in providing adequate, reasonably priced water for agricultural activities.			X
(3) Encourage public and private investment to increase water supply and to improve transmission, storage, and irrigation facilities in support of diversified agriculture and aquaculture.			X
(4) Assist in the formation and operation of production and marketing associations and cooperatives to reduce production and marketing costs.			X
(5) Encourage and assist with the development of a waterborne and airborne freight and cargo system capable of meeting the needs of Hawai‘i’s agricultural community			X
(6) Seek favorable freight rates for Hawai‘i’s agricultural products from interisland and overseas transportation operators.			X
(7) Encourage the development and expansion of agricultural and aquacultural activities which offer long-term economic growth potential and employment opportunities.			X
(8) Continue the development of agricultural parks and other programs to assist small independent farmers in securing agricultural lands and loans.			X
(9) Require agricultural uses in agricultural subdivisions and closely monitor the uses in these subdivisions.			X
(e) Priority guidelines for water use and development:			
(1) Maintain and improve water conservation programs to reduce the overall water consumption rate.			X
(2) Encourage the improvement of irrigation technology and promote the use of non-potable water for agricultural and landscaping purposes.			X
(3) Increase the support for research and development of economically feasible alternative water sources.			X
(4) Explore alternative funding sources and approaches to support future water development programs and water system improvements.			X
(f) Priority guidelines for energy use and development:			
(1) Encourage the development, demonstration, and commercialization of renewable energy sources.			X

Table 4-2: Part III of the Hawai‘i State Plan	S	NS	N/A
(2) Initiate, maintain, and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy.	X		
(3) Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings.			X
(4) Encourage the development and use of energy conserving and cost-efficient transportation systems.			X
(g) Priority guidelines to promote the development of the information industry:			
(1) Establish an information network, with an emphasis on broadband and wireless infrastructure and capability that will serve as the foundation of and catalyst for overall economic growth and diversification in Hawaii.			X
(2) Encourage the development of services such as financial data processing, a products and services exchange, foreign language translations, telemarketing, teleconferencing, a twenty-four-hour international stock exchange, international banking, and a Pacific Rim management center.			X
(3) Encourage the development of small businesses in the information field such as software development; the development of new information systems, peripherals, and applications; data conversion and data entry services; and home or cottage services such as computer programming, secretarial, and accounting services.			X
(4) Encourage the development or expansion of educational and training opportunities for residents in the information and telecommunications fields.	X		
(5) Encourage research activities, including legal research in the information and telecommunications fields.	X		
(6) Support promotional activities to market Hawaii's information industry services.			X
(7) Encourage the location or co-location of telecommunication or wireless information relay facilities in the community, including public areas, where scientific evidence indicates that the public health, safety, and welfare would not be adversely affected.			X

Discussion: The Proposed Action will support the Economic Priority Guidelines.

The Proposed Action will result in the development of the Innovation Center P3 Project which will create a world-class student housing, innovation and classroom complex, currently unavailable on the UHM Campus. The Innovation Center P3 Project that will strengthen community assets and facilitate economic growth for UH, as well as the State.

The academic programming and research support that will be offered at the Innovation Center P3 has the potential to both: a) develop a much needed third major economic sector for the State of Hawai‘i, that will be able to create high-quality living- wage jobs, and b) prepare students to address the challenges and opportunities faced by Hawai‘i, and the world, in a quickly evolving digital century.

Moreover, as mentioned before, the academic and research programming offered at the UHM will continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution and provide students the opportunity to be successful academically and professionally, which will in turn benefit that State’s economy as students join the State’s workforce.

The UHM also seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations.

Table 4-2: Part III of the Hawai‘i State Plan	S	NS	N/A
§226-104 Population growth and land resources priority guidelines.			
(a) Priority guidelines to effect desired statewide growth and distribution:			
(1) Encourage planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawai‘i's people.			X
(2) Manage a growth rate for Hawai‘i’s economy that will parallel future employment needs for Hawai‘i’s people.			X
(3) Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.			X
(4) Encourage major state and federal investments and services to promote economic development and private investment to the neighbor islands, as appropriate.			X
(5) Explore the possibility of making available urban land, low-interest loans, and housing subsidies to encourage the provision of housing to support selective economic and population growth on the neighbor islands.			X
(6) Seek federal funds and other funding sources outside the State for research, program development, and training to provide future employment opportunities on the neighbor islands.			X
(7) Support the development of high technology parks on the neighbor islands.			X
(b) Priority guidelines for regional growth distribution and land resource utilization:			
(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.			X
(2) Make available marginal or non-essential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.			X
(3) Restrict development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area.			X
(4) Encourage restriction of new urban development in areas where water is insufficient from any source for both agricultural and domestic use.			X
(5) In order to preserve green belts, give priority to state capital improvement funds which encourage location of urban development within existing urban areas except where compelling public interest dictates development of a non-contiguous new urban core.			X
(6) Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces.	X		
(7) Pursue rehabilitation of appropriate urban areas.	X		
(8) Support the redevelopment of Kaka‘ako into a viable residential, industrial, and commercial community.			X
(9) Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.	X		

Table 4-2: Part III of the Hawai'i State Plan	S	NS	N/A
(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
Discussion: The Proposed Action will support the objectives and policies for the Population Growth and Land Resources Priority Guidelines. The Proposed Action incorporates two P3 projects whereby the developers are building, financing, operating, and maintaining the facilities and associated infrastructure for a long-term period, helping reduce the cost of construction, operation, and maintenance for the UHM. Moreover, the Proposed Action intends to organize campus space and investments to optimize utility, density, and economic performance by improving building utilization and occupancy; improving the overall facility portfolio effectiveness; create land banks for future use, such as R+D or Play Innovation Spaces; develop a long-term strategic energy management plan; and pursue revenue-generating developments and partnerships. The UH intends to reduce the total square footage by improving utilization and occupancy rates, increase space utilization and efficiency of class scheduling; increase the amount of collaborative space for meetings, study, or recreational activities to enhance on-campus life and the student experience; enhance the quality and quantity of research space; improve the circulation efficiency; decrease reliance on portables; and reduce deferred maintenance at the existing UHM campus, away from critical environmental areas and will use resources wisely.			
§226-105 Crime and criminal justice Priority guidelines in the area of crime and criminal justice:			
(1) Support law enforcement activities and other criminal justice efforts that are directed to provide a safer environment.			X
(2) Target state and local resources on efforts to reduce the incidence of violent crime and on programs relating to the apprehension and prosecution of repeat offenders.			X
(3) Support community and neighborhood program initiatives that enable residents to assist law enforcement agencies in preventing criminal activities.			X
(4) Reduce overcrowding or substandard conditions in correctional facilities through a comprehensive approach among all criminal justice agencies which may include sentencing law revisions and use of alternative sanctions other than incarceration for persons who pose no danger to their community.			X
(5) Provide a range of appropriate sanctions for juvenile offenders, including community-based programs and other alternative sanctions.			X
(6) Increase public and private efforts to assist witnesses and victims of crimes and to minimize the costs of victimization.			X

Table 4-2: Part III of the Hawai‘i State Plan	S	NS	N/A
Discussion: The priority guidelines related to crime and criminal justice are not applicable to the Proposed Action.			
§226-106 Affordable housing Priority guidelines for the provision of affordable housing:			
(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
(7) Encourage improved coordination between various agencies and levels of government to deal with housing policies and regulations.			X
(8) Give higher priority to the provision of quality housing that is affordable for Hawaii's residents and less priority to development of housing intended primarily for individuals outside of Hawaii.			X
Discussion: The priority guidelines related to affordable housing are not applicable to the Proposed Action.			
§226-107 Quality education. Priority guidelines to promote quality education:			
(1) Pursue effective programs which reflect the varied district, school, and student needs to strengthen basic skills achievement.	X		
(2) Continue emphasis on general education “core” requirements to provide common background to students and essential support to other university programs.	X		
(3) Initiate efforts to improve the quality of education by improving the capabilities of the education work force.	X		
(4) Promote increased opportunities for greater autonomy and flexibility of educational institutions in their decision-making responsibilities.			X
(5) Increase and improve the use of information technology in education by the availability of telecommunications equipment for: (A) The electronic exchange of information; (B) Statewide electronic mail; and I Access to the Internet. Encourage programs that increase the public’s awareness and understanding of the impact of information technologies on our lives.			X

Table 4-2: Part III of the Hawai‘i State Plan	S	NS	N/A
(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
Discussion: The Proposed Action reflects the UHM’s vision and educational priorities over the next 5-10 years and endeavors to address current and projected space needs on campus. The UHM is the largest and oldest of the ten campuses within the overall UH system. The UHM offers hundreds of undergraduate, graduate, doctoral, and professional degree programs. The UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The UHM also provides 21 National Collegiate Athletic Association (NCAA) Division I athletic programs with approximately 450 student athletes competing on men’s, women’s, and co-ed varsity teams. The UHM has been widely recognized as a world-class university providing affordable, quality higher education to the people of Hawai‘i and for conducting pioneering research to address critical issues facing the State. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retains current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers. Moreover, the Proposed Action will also provide much needed facilities to support the various programs offered at the UHM which will provide students the opportunity to be successful academically and professionally to pursue their socio-economic aspirations.			
§226-108 Sustainability. Priority guidelines and principles to promote sustainability:			
(1) Encouraging balanced economic, social, community, and environmental priorities.			X
(2) Encouraging planning that respects and promotes living within the natural resources and limits of the State.	X		
(3) Promoting a diversified and dynamic economy.	X		
(4) Encouraging respect for the host culture.	X		
(5) Promoting decisions based on meeting the needs of the present without compromising the needs of future generations.	X		
(6) Considering the principles of the ahupua‘a system.	X		
(7) Emphasizing that everyone, including individuals, families, communities, businesses, and government, has the responsibility for achieving a sustainable Hawai‘i.			X
Discussion: The Proposed Action will support the priority guidelines and principles regarding sustainability. The UHM’s landscape is one of its most valuable and distinctive attributes, the UHM’s goal is to celebrate its unique natural assets and reduce impervious surfaces. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources. One of the UHM’s goals is to create a living campus that supports community and student well-being. This will include services for students, staff, and faculty as well as members of the local community, and a long-term emphasis			

Table 4-2: Part III of the Hawai'i State Plan	S	NS	N/A
on encouraging development of student and faculty housing on and near campus. Leveraging the UHM campus as a program opportunity would allow the UH to invest in the quality of campus life and citizenship which also means investing in a range of recreation opportunities including everything from the lo'i space, athletic fields, to hiking trails and outdoor eating spaces. Creating key areas and zones that serve the wider public as well as the immediate campus community will serve to heighten regional appreciation and awareness of UHM's research pursuits and increase the UH's civic value for decades to come. Moreover, The UH also intends to create vibrant gathering spaces that can be the foundation of the UHM campus development. This includes supporting gathering spaces at all scales – formal and informal, and indoor and outdoor. The UHM also seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. This will in turn benefit the natural resources in the region.			
§226-109 Climate change adaptation. Priority guidelines for climate change adaptation:			
(1) Ensure that Hawaii's people are educated, informed, and aware of the impacts climate change may have on their communities.			**X**
(2) Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies.			**X**
(3) Invest in continued monitoring and research of Hawaii's climate and the impacts of climate change on the State.	**X**		
(4) Consider native Hawaiian traditional knowledge and practices in planning for the impacts of climate change.			**X**
(5) Encourage the preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, forests, streams, floodplains, and wetlands that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change.			**X**
(6) Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments.			**X**
(7) Promote sector resilience in areas such as water, roads, airports, and public health, by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options.	**X**		
(8) Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other nongovernmental entities, including nonprofit entities.			**X**
(9) Use management and implementation approaches that encourage the continual collection, evaluation, and integration of new information and strategies into new and existing practices, policies, and plans.			**X**
(10) Encourage planning and management of the natural and built environments that effectively integrate climate change policy.			**X**
Discussion: The Proposed Action support the priority guideline policies and objectives related to climate change adaptation. The UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The Proposed Action intends to continue to promote the UHM as a world-class institution			

Table 4-2: Part III of the Hawai'i State Plan	S	NS	N/A
with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retain current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers, including climate change science.			

4.1.2. State Functional Plans

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 4-3: Hawai'i State Functional Plans		S	NS	N/A
1	**Agricultural State Functional Plan (1991)**			
Purpose: Continued viability of agriculture throughout the State.				**X**
Discussion: The Proposed Action is not applicable to the Agricultural State Functional Plan.				
2	**Conservation Lands State Functional Plan (1991)**			
Purpose: 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**
Discussion: The Proposed Action is not applicable to the Conservation Lands State Functional Plan.				
3	**Education State Functional Plan (1989)**			
Purpose: Improvements to Hawai'i's educational curriculum, quality of educational staff, and access to adequate facilities.		**X**		
Discussion: The Proposed Action will support the Education State Functional Plan. The Proposed Action reflects the UHM's vision and educational priorities over the next 5-10 years and endeavors to address current and projected space needs on campus. The UHM is the largest and oldest of the ten campuses within the overall UH system. The UHM offers hundreds of undergraduate, graduate, doctoral, and professional degree programs. The UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The UHM also provides 21 National Collegiate Athletic Association (NCAA) Division I athletic programs with approximately 450 student athletes competing on men's, women's, and co-ed varsity teams. The UHM has been widely recognized as a world-class university providing affordable, quality higher education to the people of Hawai'i and for conducting pioneering research to address critical issues facing the State. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retains current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers. Moreover, the Proposed Action will also provide much needed facilities to support the various programs offered at the UHM which will provide students the opportunity to be successful academically and professionally to pursue their socio-economic aspirations.				

Table 4-3: Hawai'i State Functional Plans		S	NS	N/A
4	**Employment State Functional Plan (1990)**			
Purpose: 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**		
Discussion: The Proposed Action will support the Employment State Functional Plan. As mentioned before, the academic and research programming offered at the UHM will continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution and provide students the opportunity to be successful academically and professionally, which will in turn benefit that State's economy as students join the State's workforce.				
5	**Energy State Functional Plan (1991)**			
Purpose: Lessen the reliance on petroleum and other fossil fuels in favor of alternative sources of energy so as to keep up with the State's increasing energy demands while also becoming a more sustainable island state; achieving dependable, efficient, and economical statewide energy systems.		**X**		
Discussion: The Proposed Action supports the Energy State Functional Plan. The UHM also seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. This will in turn benefit the natural resources in the region.				
6	**Health State Functional Plan**			
Purpose: 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**
Discussion: The Health State Functional Plan is not applicable to the Proposed Action.				
7	**Higher Education Functional Plan (1984)**			
Purpose: Prepare Hawai'i's citizens for the demands of an increasingly complex world through providing technical and intellectual tools.		**X**		
Discussion: The Proposed Action supports the Higher Education State Functional Plan The Proposed Action reflects the UHM's vision and educational priorities over the next 5-10 years and endeavors to address current and projected space needs on campus. The UHM is the largest and oldest of the ten campuses within the overall UH system. The UHM offers hundreds of undergraduate, graduate, doctoral, and professional degree programs. The UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The UHM also provides 21 National Collegiate Athletic Association (NCAA) Division I athletic programs with approximately 450 student athletes competing on men's, women's, and co-ed varsity teams. The UHM has been widely recognized as a world-class university providing affordable, quality higher education to the people of Hawai'i and for conducting pioneering research to address critical issues facing the State. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retains current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers. Moreover, the Proposed Action will also provide much needed facilities to support the various programs offered at the UHM which will provide students the opportunity to be successful academically and professionally to pursue their socio-economic aspirations.				

Table 4-3: Hawai'i State Functional Plans	S	NS	N/A
8 **Historic Preservation State Functional Plan (1991)**			
Purpose: 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**		
Discussion: The Proposed Action will support the Historic Preservation State Functional Plan. No significant impacts to historic resources are anticipated for the Proposed Action. It is acknowledged that the results of the ARCA indicate that there are archeological historic properties that exist on the UHM campus and there is the potential for more to be identified. While the UHM campus has been altered to a large extent over the past century through agricultural practices, quarry activities, and the development of the existing UHM campus, it remains possible that subsurface archeological resources may exist at the UHM campus. However, applicable mitigation measure are recommended to minimize potential impacts. With regards to any renovation work being conducted as part of the Proposed Action that could potentially impact buildings considered historic (e.g., Sinclair Library), a historic review is recommended to be conducted prior to any alteration of identified buildings.			
9 **Housing State Functional Plan (1989)**			
Purpose: 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**
Discussion: The Housing State Functional Plan is not applicable to the Proposed Action.			
10 **Human Services State Functional Plan (1991)**			
Purpose: 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**
Discussion: The Proposed Action is not applicable to the Human Services State Functional Plan.			
11 **Recreation State Functional Plan (1991)**			
Purpose: 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**		
Discussion: The Proposed Action will support the Recreation State Functional Plan. One of the UHM's goals is to create a living campus that supports community and student well-being. This will include services for students, staff, and faculty as well as members of the local community, and a long-term emphasis on encouraging development of student and faculty housing on and near campus. Leveraging the UHM campus as a program opportunity would allow the UH to invest in the quality of campus life and citizenship which also means investing in a range of recreation opportunities including everything from the lo'i space, athletic fields, to hiking trails and outdoor eating spaces. Creating key areas and zones that serve the wider public as well as the immediate campus community will serve to heighten regional appreciation and awareness of UHM's research pursuits and increase the UH's civic value for decades to come. Moreover, The UH also intends to create vibrant gathering spaces that can be the foundation of the UHM campus development. This includes supporting gathering spaces at all scales – formal and informal, and indoor and outdoor.			
12 **Tourism State Functional Plan (1991)**			
Purpose: 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			**X**

Table 4-3: Hawai'i State Functional Plans	S	NS	N/A
productive workforce and enhancement of career and employment opportunities in the visitor industry.			
Discussion: The Proposed Action is not applicable to the Tourism State Functional Plan.			
13 **Transportation State Functional Plan (1991)**			
Purpose: 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**		
Discussion: The Proposed Action supports the Transportation State Functional Plan. The UHM is striving to transform from a commuter campus to a pedestrian-centered place of learning. To achieve this goal, the UHM intends to reduce parking accommodations; prioritize pedestrian pathways and wayfinding on the Central Campus; develop alternative transit solutions to one-driver-one-car such as a transit hub, developing an off-campus parking strategy, and anticipating future mobility changes; and create velocity-based on-campus hierarchy of circulation. In the near-term, this will involve relocating parking and vehicular circulation from the core of the central campus to the periphery. In the long term, the University will develop, promote, and support alternatives to commuting via private vehicles, which may include ridesharing, enhanced public transit, an expanded UHM shuttle system, human-powered and motorized bicycles and scooters, autonomous vehicles, and the possible extension of rail to the UHM campus.			

4.1.3. State Land Use District

The State Land Use Law, Chapter 205, HRS, 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 Chapter 205, HRS, 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 Title 12, Chapter 205 (Land Use Commission), HRS, and the State Land Use Commission's Administrative Rules prescribed under Title 15, Subtitle 3, Chapter 15 HAR.

Discussion:

The Project is situated entirely in the Urban State Land Use District (See Figure 4-1). Urban District lands 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.

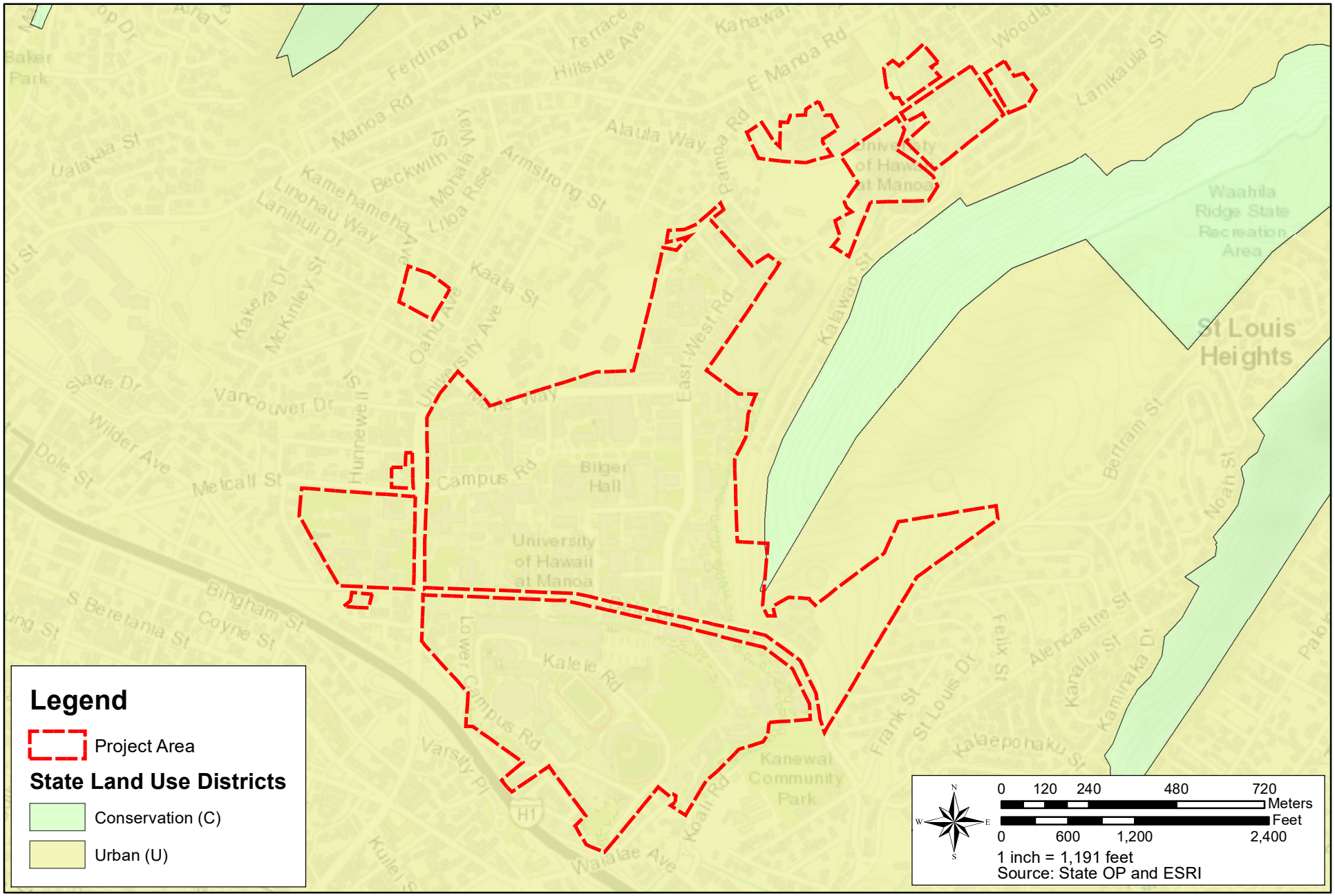

FIGURE 4-1

STATE LAND USE DISTRICT MAP

In general, lot sizes and uses permitted in the district area are established by the county through ordinances or rules. The purpose and intent of the proposed project are consistent with the Urban State Land Use District.

4.1.4. Hawai'i Coastal Zone Management Program

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 Chapter 205A, HRS, 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 sea.

The Proposed Action's conformance with the ten objectives and numerous policies of the State of Hawai'i CZMP is set forth in Table 4-4 below. The Proposed Action does not include the use of land that is within the Special Management Area as designated by the City and County of Honolulu (See Figure 4-2). Therefore, Special Management Area permits are not required to implement the Proposed Action.

Table 4-4: Hawai'i Coastal Zone Management Act	S	NS	N/A
Recreational Resources			
Objective: Provide coastal recreational opportunities accessible to the public.			
Policies			
(A) Improve coordination and funding of coastal recreational planning and management; and			X
(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:	X		
i. Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;			X
ii. Requiring restoration of coastal resources that have significant recreational and ecosystem value, including, but not limited to, coral reefs, surfing sites, fishponds, sand beaches, and coastal dunes, when these resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when restoration is not feasible or desirable;			X
iii. Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;			X
iv. Providing an adequate supply of shoreline parks and other recreational facilities suitable public recreation;			X
v. Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;			X

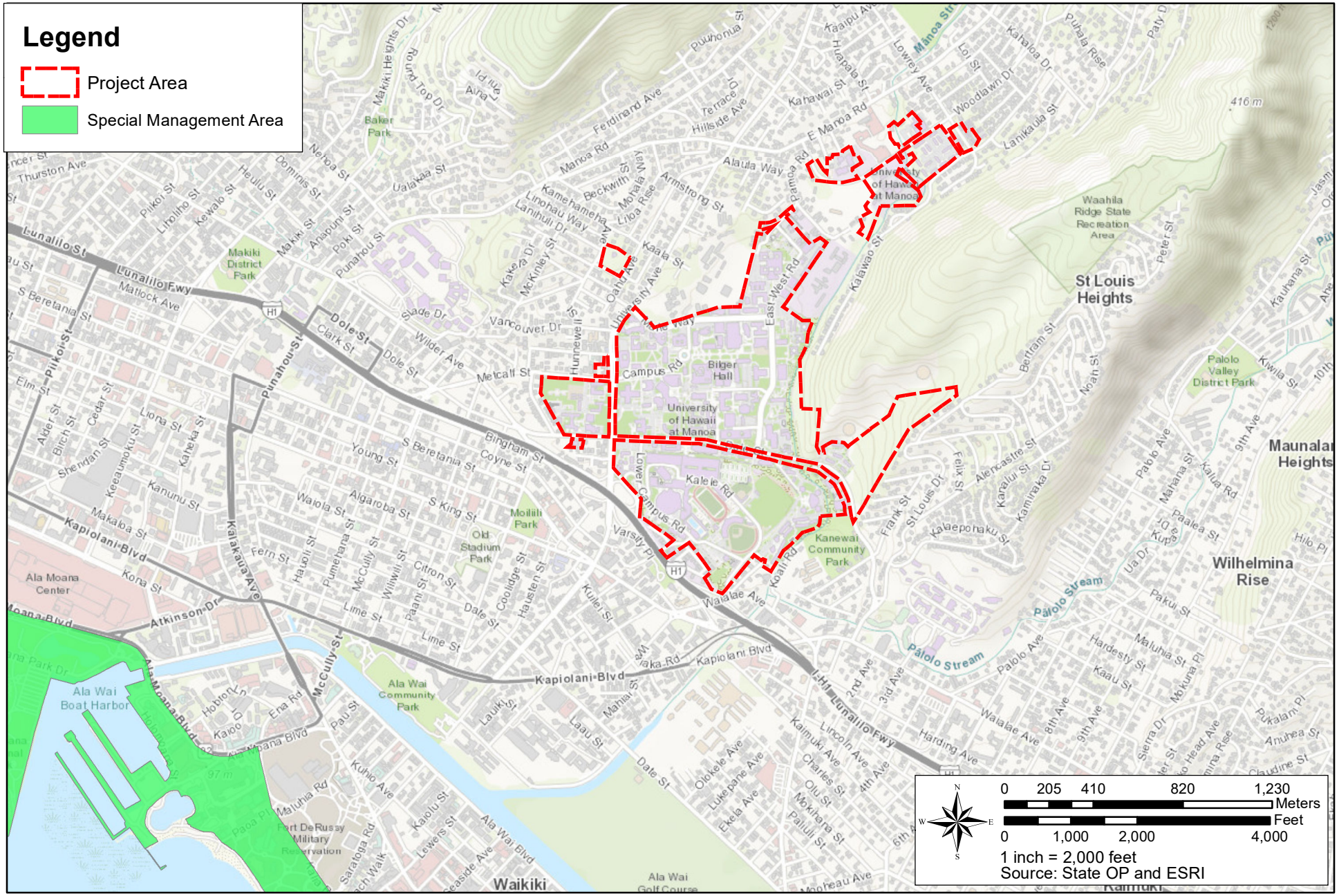

FIGURE 4-2

SPECIAL MANAGEMENT AREA MAP

WILSON OKAMOTO CORPORATION

Table 4-4: Hawai'i Coastal Zone Management Act	S	NS	N/A
vi. Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;			X
vii. Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and			X
viii. Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting that dedication against the requirements of section 46-6.			X
Discussion: The Proposed Action is not a coastal dependent development. The Project Site is approximately 1.3 miles from the shoreline and will not impact coastal recreational opportunities that are accessible to the public. However, the UHM is situated within the CZM and one of the UHM's goals is to create a living campus that supports community and student well-being. This will include services for students, staff, and faculty as well as members of the local community, and a long-term emphasis on encouraging development of student and faculty housing on and near campus. Leveraging the UHM campus as a program opportunity would allow the UH to invest in the quality of campus life and citizenship which also means investing in a range of recreation opportunities including everything from the lo'i space, athletic fields, to hiking trails and outdoor eating spaces. Creating key areas and zones that serve the wider public as well as the immediate campus community will serve to heighten regional appreciation and awareness of UHM's research pursuits and increase the UH's civic value for decades to come. Moreover, The UH also intends to create vibrant gathering spaces that can be the foundation of the UHM campus development. This includes supporting gathering spaces at all scales – formal and informal, and indoor and outdoor.			
Historic Resources			
Objective: Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.			
Policies:			
(A) Identify and analyze significant archaeological resources;	X		
(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and			X
(C) Support state goals for protection, restoration, interpretation, and display of historic resources.	X		
Discussion: The Proposed Action will have no significant impact on historic and cultural resources. It is acknowledged that the results of the ARCA indicate that there are archeological historic properties that exist on the UHM campus and there is the potential for more to be identified. While the UHM campus has been altered to a large extent over the past century through agricultural practices, quarry activities, and the development of the existing UHM campus, it remains possible that subsurface archeological resources may exist at the UHM campus. However, applicable mitigation measure are recommended to minimize potential impacts. With regards to any renovation work being conducted as part of the Proposed Action that could potentially impact buildings considered historic (e.g., Sinclair Library), a historic review is recommended to be conducted prior to any alteration of identified buildings.			
Scenic and Open Space Resources			

Table 4-4: Hawai'i Coastal Zone Management Act	S	NS	N/A
Objective: Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.			
Policies			
(A) Identify valued scenic resources in the coastal zone management area;			X
(B) Ensure that new developments are compatible with their visual environment by designing and locating those developments to minimize the alteration of natural land forms and existing public views to and along the shoreline;	X		
(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and			X
(D) Encourage those developments that are not coastal dependent to locate in inland areas.			X
Discussion: The Proposed Action does not have an impact on scenic and open space resources. The Project Site consists of a highly developed urban environment and has been successively altered over the past century. As discussed in Section 3.13 (Visual Resources) the Proposed Action would remain consistent with the existing visual character of the UHM campus and the surrounding area, including both the urban and natural settings. With regards to the existing significant landscapes, these are not anticipated to be impacted by the Proposed Action. Where the New Construction/Replacement of Existing Structures (Net Increase) Projects are sited to occur, there are no significant landscapes in the immediate vicinity. In fact, as a part of this Proposed Action, a Landscape Master Plan is being developed for the subsequent PRU Permit. The UHM's landscape is one of its most valuable and distinctive attributes, the UHM's goal is to celebrate its unique natural assets. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources. Thus, it is anticipated that any significant plants or landscapes that may need to be removed or altered to implement the Proposed Action would be returned to existing conditions to the extent feasible or enhanced.			
Coastal Ecosystems			
Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.			
Policies			
(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;			X
(B) Improve the technical basis for natural resource management;			X
(C) Preserve valuable coastal ecosystems of significant biological or economic importance, including reefs, beaches, and dunes;			X
(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and			X
(E) Promote water quantity and quality planning and management practices that reflect the tolerance of freshwater and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.			X
Discussion: The Proposed Action is not a coastal dependent development and is not anticipated to have an effect on coastal ecosystems as the Project Site is approximately 1.3 miles from the shoreline. Moreover, all applicable construction best managements practices will be implemented with regarding runoff to ensure any potential impacts to coastal ecosystems are mitigated.			

Table 4-4: Hawai'i Coastal Zone Management Act	S	NS	N/A
Economic Uses			
Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.			
Policies			
(A) Concentrate coastal dependent development in appropriate areas;			**X**
(B) Ensure that coastal dependent development and coastal related development are located, designed, and constructed to minimize exposure to coastal hazards and adverse social, visual, and environmental impacts in the coastal zone management area; and			**X**
(C) Direct the location and expansion of coastal development to areas designated and used for that development and permit reasonable long-term growth at those areas, and permit coastal development outside of presently designated areas when:			**X**
i. Use of designated locations is not feasible;			**X**
ii. Adverse environmental effects and risks from coastal hazards are minimized; and			**X**
iii. The development is important to the State's economy;			**X**
Discussion: The Proposed Action is not a coastal dependent development and is not anticipated to have an effect on coastal economic uses as the Project Site is approximately 1.3 miles from the shoreline.			
Coastal Hazards			
Objective: Reduce hazard to life and property from coastal hazards.			
Policies			
(A) Develop and communicate adequate information about the risks of coastal hazards;			**X**
(B) Control development, including planning and zoning control, in areas subject to coastal hazards;			**X**
(C) Ensure that developments comply with requirements of the National Flood Insurance Program; and			**X**
(D) Prevent coastal flooding from inland projects.			**X**
Discussion: As discussed in Section 3.5 (Natural Hazards) the Project Site is not in an area prone to erosion, flooding, tsunami, hurricanes, earthquake, volcanic eruptions, or other hazards and the Proposed Action will not exacerbate any natural hazard conditions. The Project Site is not located in a Tsunami Inundation Zone and is not likely to be damaged in the event of flooding. All of the Proposed Action's structures will be designed in compliance with the CCH's building code. Impacts from natural hazards can be further mitigated by adherence to appropriate civil defense evacuation procedures.			
Managing Development			
Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.			
Policies			
(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;			**X**

Table 4-4: Hawai'i Coastal Zone Management Act	S	NS	N/A
(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and			X
(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.	X		
Discussion: This EA has been prepared under the procedural provisions of HRS, Chapter 343, and HAR, Title 11, Chapter 200.1, which allows for public review and participation. Accordingly, the preparation of this EA, and disclosure of anticipated effects of the project, will comply with the policy on managing development, and be reviewed by the public and various state and county agencies through this EA process. The Early Consultation/Pre-Assessment process included efforts to inform the community and solicit input in scoping the EA for the Proposed Action. It should be noted that on February 25, 2021, an Early Consultation/Pre-Assessment Package for the Clarence T.C. Ching Athletic Complex Phase 1 Expansion was mailed out to State and City and County of Honolulu agencies, as well as various community stakeholders. Shortly thereafter, the University of Hawai'i determined that the Clarence T.C. Ching Athletic Complex Phase 1 Expansion would not require the preparation of Chapter 343, HRS environmental documentation as previous disclosure documents adequately assessed the general nature of the proposed improvements. However, the comments received from the February 2021 Early Consultation/Pre-Assessment Package for the Clarence T.C. Ching Athletic Complex Phase 1 Expansion were reviewed and are incorporated within this EA documentation to the extent feasible as it relates to the Clarence T.C. Ching Athletic Complex Phase 2 Expansion. The Early Consultation/Pre-Assessment Package for the Proposed Action was mailed out on January 3, 2022, to the following agencies, organizations, and stakeholders listed in Section 7.1.			
Public Participation			
Objective: Stimulate public awareness, education, and participation in coastal management.			
Policies:			
(A) Promote public involvement in coastal zone management processes;	X		
(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and	X		
(C) Organize workshops, policy dialogues, and site-specific mitigation to respond to coastal issues and conflicts.			X
Discussion: This EA has been prepared under the procedural provisions of HRS, Chapter 343, and HAR, Title 11, Chapter 200.1, which allows for public review and participation. Accordingly, the preparation of this EA, and disclosure of anticipated effects of the project, will comply with the policy on managing development, and be reviewed by the public and various state and county agencies through this EA process. In addition, following the publication of the Draft EA through the State Environmental Review Program's *The Environmental Notice*, a 30-day public comment period follows whereby the public can participate and provide comments on the Proposed Action.			
Beach and Coastal Dune Protection			
Objective: (A) Protect beaches and coastal dunes for: (i)Public use and recreation; (ii) The benefit of coastal ecosystems; and (iii) Use as natural buffers against coastal hazards; and (B) Coordinate and fund beach management and protection.			

Table 4-4: Hawai'i Coastal Zone Management Act	S	NS	N/A
Policies:			
(A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;			**X**
(B) Prohibit construction of private shoreline hardening including seawalls and revetments, at sites having sand beaches and at sites where shoreline hardening structures interfere with existing recreational and waterline activities; and			**X**
(C) Minimize the construction of public shoreline hardening structures including seawalls and revetments, at sites having sand beaches and at sites where shoreline hardening structures interfere with existing recreational and waterline activities;			**X**
(D) Minimize grading of and damage to coastal dunes;			**X**
(E) Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor; and			**X**
(F) Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor.			**X**
Discussion: The Proposed Action is not a coastal dependent development and is not anticipated to have an effect on coastal beaches or dunes as the Project Site is approximately 1.3 miles from the shoreline.			
Marine and Coastal Resources			
Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.			
Policies			
(A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;			**X**
(B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;			**X**
(C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;			**X**
(D) Promote research, study, and understanding of ocean and coastal processes, impacts of climate change and sea level rise, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how coastal development activities relate to and impact ocean and coastal resources; and	**X**		
(E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.			**X**
Discussion: The Proposed Action is not anticipated to adversely affect marine or aquatic resources. The proposed project site is well outside the coastal zone. Appropriate best management practices and erosion control measures will be implemented to ensure that marine and coastal resources are not adversely impacted from construction activities. However, the UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-			

Table 4-4: Hawai'i Coastal Zone Management Act	S	NS	N/A
ranked research institution. To remain a top-ranked research institution, the UHM intends to retain current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers, including climate change science.			

4.2. City and County of Honolulu Land Use Plans and Policies

4.2.1. City and County of Honolulu General Plan

The CCH last updated its General Plan (1992 edition) in October 2002. The General Plan is intended to be a dynamic document, expressing the aspirations of the residents of O'ahu. It sets forth the long-range objectives and policies for the general welfare and, together with the regional development plans, provides a direction and framework to guide the programs and activities of the CCH. It is a written commitment by the CCH government to a future for the island of O'ahu that it considers desirable and attainable. The General Plan is a two-fold document: First, it is a statement of the long-range social, economic, environmental, and design objectives for the general welfare and prosperity of the people of O'ahu. These objectives contain both statements of desirable conditions to be sought over the long run and statements of desirable conditions that can be achieved within an approximately 20-year time horizon. Second, the General Plan is a statement of broad policies that facilitate the attainment of the objectives of the General Plan.

The General Plan is a guide for all levels of government, private enterprise, neighborhood and citizen groups, organizations, and individual citizens in eleven areas of concern:

(1) Population;
(2) Economic Activity;
(3) Natural Environment;
(4) Housing;
(5) Transportation and utilities;
(6) Energy;
(7) Physical development and urban design;
(8) Public safety;
(9) Health and Education;
(10) Culture and recreation; and
(11) Government operations and fiscal management.

The Proposed Action is relevant and consistent with the following applicable goals, objectives, policies, and actions of the *City and County of Honolulu General Plan*:

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
I. Population			
Objective A. To control the growth of O'ahu's resident and visitor populations in order to avoid social, economic, and environmental disruptions.			
(1) Participate in State and Federal programs which seek to develop social, economic, legal, and environmental controls over population growth.			**X**

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(2) Seek a balance between the rate of immigration and the rate of outmigration by reducing immigration.			X
(3) Support Federal policies providing for a more even distribution of immigrants throughout the country.			X
(4) Seek to maintain a desirable pace of physical development through City and County regulations.			X
(5) Encourage family planning.			X
(6) Publicize the desire of the City and County to limit population growth.			X
Discussion: The Proposed Action will not have an effect on the City and County of Honolulu's General Plan, in regards to Population, Objective A.			
Objective B. To plan for future population growth.			
(1) 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
(2) Provide adequate support facilities to accommodate future growth in the number of visitors to O'ahu.			X
Discussion: The Proposed Action will not have an effect on the City and County of Honolulu's General Plan, in regard to Population, Objective B.			
Objective C. To establish a pattern of population distribution that will allow the people of O'ahu to live and work in harmony.			
(1) Facilitate the full development of the primary urban center.	X		
(2) Encourage development within the secondary urban center at Kapolei and the 'Ewa and Central O'ahu urban-fringe areas to relieve developmental pressures in the remaining urban-fringe and rural areas and to meet housing needs not readily provided in the primary urban center.			X
(3) Manage physical growth and development in the urban-fringe and rural areas so that: a. An undesirable spreading of development is prevented; and b. Their population densities are consistent with the character of development and environmental qualities desired for such areas.			
(4) Direct growth according to Policies 1, 2, and 3 above by providing land development capacity and needed infrastructure to seek a 2025 distribution of Oahu's residential population as follows: **Location** — **% Share of 2025 Islandwide Population** Primary Urban Center 46% 'Ewa 13% Central O'ahu 17% East Honolulu 5.3% Ko'olaupoko 11.6% Ko'olauloa 1.4% North Shore 1.7%			X

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
Wai'anae 4.0% **Total** **100%**			
Discussion: The Proposed Action will support Objective C related to Population as the Proposed Action is situated within the Primary Urban Center.			
II. Economic Activity			
Objective A. To promote employment opportunities that will enable all the people of O'ahu to attain a decent standard of living.			
(1) Encourage the growth and diversification of O'ahu's economic base.	**X**		
(2) Encourage the development of small businesses and larger industries which will contribute to the economic and social well-being of O'ahu residents.	**X**		
(3) Encourage the development in appropriate locations on O'ahu of trade, communications, and other industries of a nonpolluting nature.			**X**
(4) Encourage the development of local, national, and world markets for the products of O'ahu-based industries.			**X**
(5) Encourage the wider distribution of available employment opportunities through such methods as shortening the work week and reducing the use of overtime.			**X**
(6) Encourage the continuation of a significant level of Federal employment on O'ahu.			**X**
Discussion: The Proposed Action will support the City and County of Honolulu's General Plan, in regards to Economic Activity, Objective A. Implementing the Proposed Action will result in construction related expenditures which will provide positive benefits on the local economy. These benefits would be derived from the creation of construction and construction support jobs as well as revenues generated by the procurement of building supplies and materials. The Proposed Action also results in the development of the Innovation Center P3 Project which will create a world-class student housing, innovation and classroom complex, currently unavailable on the UHM Campus. The Innovation Center P3 Project that will strengthen community assets and facilitate economic growth for UH, as well as the State. The academic programming and research support that will be offered at the Innovation Center P3 has the potential to both: a) develop a much needed third major economic sector for the State of Hawai'i, that will be able to create high-quality living- wage jobs, and b) prepare students to address the challenges and opportunities faced by Hawai'i, and the world, in a quickly evolving digital century. Moreover, as mentioned before, the academic and research programming offered at the UHM will continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution and provide students the opportunity to be successful academically and professionally, which will in turn benefit that State's economy as students join the State's workforce.			
Objective B. To maintain the viability of O'ahu's visitor industry.			

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(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 a high quality and safe environment for visitors and residents in Waikiki.			X
(3) Encourage private participation in improvements to facilities in Waikiki.			X
(4) Prohibit major increases in permitted development densities in Waikiki.			X
(5) Prohibit further growth in the permitted number of hotel and resort condominium units 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 and 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 beauty of Oahu for visitors as well as residents.			X
(9) Encourage the visitor industry to provide a high level of service to visitors.			X
Discussion: The Proposed Action will not have an effect on maintaining the viability of O'ahu's visitor industry.			
Objective C. To maintain the viability of agriculture on O'ahu.			
(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 Oahu, 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 Waianae 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
Discussion: The Proposed Action will not have an effect on Objective C of the City and County of Honolulu General Plan related to the viability of agriculture on the island.			
Objective D. To make full use of the economic resources of the sea.			

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(1) Assist the fishing industry to maintain its viability.			X
(2) Encourage the development of aquaculture, ocean research, and other ocean- related industries.			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
Discussion: The Proposed Action will not have an effect on Objective D of the City and County of Honolulu General Plan related economic resources of the sea.			
Objective E. To prevent the occurrence of large scale unemployment.			
(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
Discussion: The Proposed Action will support Objective E of the City and County of Honolulu General Plan related to unemployment as the academic and research programming offered at the UHM will continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution and provide students the opportunity to be successful academically and professionally, which will in turn benefit that State's economy as students join the State's workforce.			
Objective F. To increase the amount of federal spending on O'ahu.			
(1) Take full advantage of Federal programs and grants which will contribute to the economic and social well-being of O'ahu's 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
Discussion: The Proposed Action will not have an effect on Objective F of the City and County of Honolulu General Plan related to Economic Activity as the Proposed Action does not involve any federal funds.			
Objective G. To bring about orderly economic growth on O'ahu.			
(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

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(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-Kaneohe, and ʻEwa areas.			X
Discussion: The Proposed Action will not have an effect on Objective F of the City and County of Honolulu General Plan related to orderly economic growth on Oʻahu.			
III. Natural Environment			
Objective A. To protect and preserve the natural environment.			
(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
(4) Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water- recharge areas, distinctive land forms, and existing vegetation.	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
Discussion: The Proposed Action will support the Objective A of Section III of the City and County of Honolulu General Plan. Given that the UHM campus’ landscape is one of its most valuable and distinctive attributes, the UHM’s goal is to celebrate its unique natural assets and reduce impervious surfaces. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources. The UHM also seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus			

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. This will in turn benefit the natural resources in the region Moreover, no short- or long-term significant impacts on flora and faunal resources in the project vicinity are anticipated to result from the construction and operation of the Proposed Action. Construction of the projects under the Proposed Action is not anticipated to involve major land disturbing activities. Applicable erosion control measures and best management practices will be implemented to mitigate any possible adverse effects relating to special status species. There is the potential that several native and special status species may overfly or occur at the UHM campus during nesting seasons However, applicable measures to prevent adverse effects to special status species should be implemented.			
Objective B. To preserve and enhance the natural monuments and scenic views of O'ahu for the benefit of both residents and visitors.			
(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**		
Discussion: The Proposed Action will support Objective B of Section III of the City and County of Honolulu General Plan. As noted previously, the UHM campus' landscape is one of its most valuable and distinctive attributes, the UHM's goal is to celebrate its unique natural assets and reduce impervious surfaces. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources.			
IV. Housing			
Objective A. To provide decent housing for all the people of O'ahu at prices they can afford.			
(1) Develop programs and controls which will provide decent homes at the least possible cost.			**X**
(2) Streamline approval and permit procedures for housing and other development projects.			**X**
(3) Encourage innovative residential development which will result in lower costs, added convenience and privacy, and the more efficient use of streets and utilities.			**X**
(4) Establish public, and encourage private, programs to maintain and improve the condition of existing housing.			**X**

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(5) Make full use of State and Federal programs that provide financial assistance for low- and moderate-income homebuyers.			X
(6) Expand local funding mechanisms available to pay for government housing programs.			X
(7) Provide financial and other incentives to encourage the private sector to build homes for low- and moderate-income residents.			X
(8) Encourage and participate in joint public-private development of low- and moderate- income housing.			X
(9) Encourage the preservation of existing housing which is affordable to low- and moderate-income persons.			X
(10) Promote the construction of affordable dwellings which take advantage of O'ahu's year-round moderate climate.			X
(11) Encourage the construction of affordable homes within established low-density communities by such means as 'ohana' units, duplex dwellings, and cluster development.			X
(12) Encourage the production and maintenance of affordable rental housing.			X
(13) Encourage the provision of affordable housing designed for the elderly and the handicapped.			X
(14) Encourage equitable relationships between landowners and leaseholders, between landlords and tenants, and between condominium developers and owners.			X
Discussion: The Proposed Action will not have an effect on Objective A of Section IV of the City and County of Honolulu General Plan related to housing.			
Objective B. To reduce speculation in land and housing.			
(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
Discussion: The Proposed Action will not affect Objective B of Section IV of the City and County of Honolulu General Plan related to housing.			
Objective C. 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.			
(1) Encourage residential developments that offer a variety of homes to people of different income levels and to families of various sizes.			X

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(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
Discussion: The Proposed Action will not affect Objective C of Section IV of the City and County of Honolulu General Plan related to housing.			
V. Transportation & Utilities			
Objective A. 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.			
(1) Develop and maintain an integrated ground-transportation system consisting of the following elements and their primary purposes:			
a. Public transportation-for travel to and from work, and travel within Central Honolulu;			X
b. Roads and highways-for commercial traffic and travel in nonurban areas;			X
c. Bikeways-for recreational activities and trips to work, schools, shopping centers, and community facilities; and	X		
d. Pedestrian walkways-for getting around Downtown and Waikiki, and for trips to schools, parks, and shopping centers.			X
(2) 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 feeder-bus components as well as through the existing highway system with limited improvements as may be appropriate.			X
(3) Provide transportation services outside the Ewa, Central O'ahu , and Pearl City-Hawai'i Kai corridors primarily through a system of express- and feeder-buses as well as through the highway system with limited to moderate improvements sufficient to meet the needs of the communities being served.			X
(4) 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
(5) Improve roads in existing communities to reduce congestion and eliminate unsafe conditions.			X
(6) Consider both environmental impact as well as construction and operating costs as important factors in planning alternative nodes of transportation.	X		

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(7) Promote the use of public transportation as a means of moving people quickly and efficiently, of conserving energy, and of guiding urban development.	X		
(8) Make available transportation services to people with limited mobility: the young, the elderly, the handicapped, and the poor.			X
(9) Promote programs to reduce dependence on the use of automobiles.	X		
(10) Discourage the inefficient use of the private automobile, especially in congested corridors and during peak-hours.	X		
(11) Make public, and encourage private, improvements to major walkway systems.	X		
(12) Encourage the provision of separate aviation facilities for small civilian aircraft.			X
(13) Facilitate the development of a second deep-water harbor to relieve congestion in Honolulu Harbor.			X
Discussion: The Proposed Action supports Objective A of Section V of the City and County of Honolulu General Plan related to transportation and utilities. The UHM is striving to transform from a commuter campus to a pedestrian-centered place of learning. To achieve this goal, the UHM intends to reduce parking accommodations; prioritize pedestrian pathways and wayfinding on the Central Campus; develop alternative transit solutions to one-driver-one-car such as a transit hub, developing an off-campus parking strategy, and anticipating future mobility changes; and create velocity-based on-campus hierarchy of circulation. In the near-term, this will involve relocating parking and vehicular circulation from the core of the central campus to the periphery. In the long term, the University will develop, promote, and support alternatives to commuting via private vehicles, which may include ridesharing, enhanced public transit, an expanded UHM shuttle system, human-powered and motorized bicycles and scooters, autonomous vehicles, and the possible extension of rail to the UHM campus.			
Objective 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.			
(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
Discussion: The Proposed Action will not affect Objective B of Section V of the City and County of Honolulu General Plan related to transportation and utilities.			

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
Objective C. To maintain a high level of service for all utilities.			
(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
Discussion: The Proposed Action will support Objective C of Section V of the City and County of Honolulu General Plan related to transportation and utilities. It is anticipated that the existing wastewater systems will be improved due to the Proposed Action as noted by the Sewer Master Plan included herein as Appendix B and discussed in Section 3.16.2.			
Objective D. To maintain transportation and utility systems which will help O'ahu continue to be a desirable place to live and visit.			
(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
(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
Discussion: The Proposed Action will not affect Objective D of Section V of the City and County of Honolulu General Plan related to transportation and utilities.			
VI. Energy			
Objective A. To maintain an adequate, dependable, and economical supply of energy for O'ahu residents.			
(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 environ- mental, public health, and safety concerns, to resource limitations, and to relative costs when			X

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
making decisions concerning alternatives for conserving energy and developing natural energy resources.			
(6) Work closely with the State and Federal governments in the formulation and implementation of all City and County energy-related programs.			X
Discussion: The Proposed Action will support Objective A of Section VI of the City and County of Honolulu General Plan related to energy. The UHM also seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. This will in turn assist the island's goal of attaining energy self-sufficiency.			
Objective B. To conserve energy through the more efficient management of its use.			
(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
Discussion: The Proposed Action will support Objective B of Section VI of the City and County of Honolulu General Plan related to energy. The UHM also seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. This will in turn assist the island's goal of attaining energy self-sufficiency.			
Objective C. To fully utilize proven alternative sources of energy.			
(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
Discussion: The Proposed Action will support Objective C of Section VI of the City and County of Honolulu General Plan related to energy. In order for the UHM to achieve its resiliency goals, all energy generated from the PV systems installed must be utilized (if the % Net Zero Energy is equal or less than 100%). As such, at any given time when the PV systems' energy production may exceed the campus' energy use, such excess energy must be stored. In such cases, energy storage system(s) must be incorporated onto the UHM electrical system to store such excess energy for use by the UHM campus at a later time (e.g., during peak shaving application or overnight energy use). The PV system installation will over phases, likely spanning several years. As such, the energy storage build-out would be designed to match the PV phased installation, installing energy storage only at such phase where it is either required to match the PV phased installation, installing energy, or becomes cost-beneficial due to a peak-demand or utility rate arbitrage scenario.			

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
Objective D. To develop and apply new, locally available energy resources.			
(1) Support and participate in research, development, demonstration, and commercialization programs aimed at producing new, economical, and environmentally sound energy supplies from:			
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
Discussion: The Proposed Action will not affect Objective D of Section VI of the City and County of Honolulu General Plan related to energy.			
Objective E. To establish a continuing information program.			
(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
Discussion: The Proposed Action will not affect Objective E of Section VI of the City and County of Honolulu General Plan related to energy.			
VII. Physical Development and Urban Design			
Objective A. 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.			
(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		

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(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
Discussion: The Proposed Action will support Objective A of Section VII of the City and County of Honolulu General Plan related to physical development and urban design. The Proposed Action will occur within the existing boundaries of the UHM campus, within the Primary Urban Center, where existing services and utilities currently exist. Moreover, the Proposed Action is anticipated to occur of the next 5-10 years and will be developed appropriately with the availability of adequate utility service. Moreover, the Proposed Action intends to organize campus space and investments to optimize utility, density, and economic performance by improving building utilization and occupancy; improving the overall facility portfolio effectiveness; create land banks for future use, such as R+D or Play Innovation Spaces; develop a long-term strategic energy management plan; and pursue revenue-generating developments and partnerships. The UH intends to reduce the total square footage by improving utilization and occupancy rates, increase space utilization and efficiency of class scheduling; increase the amount of collaborative space for meetings, study, or recreational activities to enhance on-campus life and the student experience; enhance the quality and quantity of research space; improve the circulation efficiency; decrease reliance on portables; and reduce deferred maintenance at the existing UHM campus, away from critical environmental areas and will use resources wisely.			
Objective B. To develop Honolulu (Waialae-Kahala to Halawa), Aiea, and Pearl City as the Island's primary urban center.			
(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

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(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
(8) 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
(9) Facilitate the redevelopment of Kakaako as a major residential, as well as commercial and light industrial area.			X
Discussion: The Proposed Action will not affect Objective B of Section VII of the City and County of Honolulu General Plan related to physical development and urban design.			
Objective C. To develop a secondary urban center with its nucleus in the Kapolei area.			
(1) Allocate funds from the City and County's capital-improvement program for public projects that are needed to facilitate development of the secondary urban center at Kapolei.			X
(2) Encourage the development of a major residential, commercial, and employment center within the secondary urban center at Kapolei.			X
(3) Encourage the continuing development of Barbers Point as a major industrial center.			X
(4) Coordinate plans for the development of the secondary urban center at Kapolei with the State and Federal governments and with the sugar industry.			X
(5) Cooperate with the State and Federal governments in the development of a deep water harbor at Barbers Point.			X
(6) 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
Discussion: The Proposed Action will not affect Objective C of Section VII of the City and County of Honolulu General Plan related to physical development and urban design as the Project Site is situated in lower Mānoa.			
Objective D. To maintain those development characteristics in the urban-fringe and rural areas which make them desirable places to live.			
(1) Develop and maintain urban-fringe areas as predominantly residential areas characterized by generally low rise, low density development which may include significant levels of retail and service commercial			X

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
uses as well as satellite institutional and public uses geared to serving the needs of households.			
(2) Coordinate plans for developments within the Ewa and Central O'ahu urban-fringe areas with the State and Federal governments and with the sugar, pineapple, and other emerging agricultural industries.			X
(3) Establish a green belt in the Ewa and Central O'ahu areas of O'ahu in the Development Plans.			X
(4) Maintain rural areas as areas which are intended to provide environments supportive of lifestyle choices which are dependent on the availability of land suitable for small to moderate size agricultural pursuits, a relatively open and scenic setting, and/or a small town, country atmosphere consisting of communities which are small in size, very low density and low rise in character, and may contain a mixture of uses.			X
Discussion: The Proposed Action will not affect Objective D of Section VII of the City and County of Honolulu General Plan related to physical development and urban design.			
Objective E. To create and maintain attractive, meaningful, and stimulated environments throughout O'ahu.			
(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
Discussion: The Proposed Action will support Objective E of Section VII of the City and County of Honolulu General Plan related to physical development and urban design. The UHM campus has been located at its current location since 1912, which is an established area for university uses and functions. Moreover, the Proposed Action intends to organize campus space and investments to optimize utility, density, and economic performance by improving building utilization and occupancy; improving the overall facility portfolio effectiveness; create land banks for future use, such as			

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
R+D or Play Innovation Spaces; develop a long-term strategic energy management plan; and pursue revenue-generating developments and partnerships. The UH intends to reduce the total square footage by improving utilization and occupancy rates, increase space utilization and efficiency of class scheduling; increase the amount of collaborative space for meetings, study, or recreational activities to enhance on-campus life and the student experience; enhance the quality and quantity of research space; improve the circulation efficiency; decrease reliance on portables; and reduce deferred maintenance at the existing UHM campus. Hence, the Proposed Action will not expand or encroach into the existing surrounding residential areas.			
Objective F. To promote and enhance the social and physical character of O'ahu's older towns and neighborhoods.			
(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
Discussion: The Proposed Action will support Objective F of Section VII of the City and County of Honolulu General Plan related to physical development and urban design. The Proposed Action involves the renovation of and optimization of several existing buildings on the UHM campus which may be considered substandard.			
VIII. Public Safety			
Objective A. To prevent and control crime and maintain public order.			
(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

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(9) Encourage the improvement of rehabilitation programs and facilities for criminals and juvenile offenders.			X
Discussion: The Proposed Action will not affect Objective A of Section VIII of the City and County of Honolulu General Plan related to public safety.			
Objective B. To protect the people of O'ahu and their property against natural disasters and other emergencies, traffic and fire hazards, and unsafe conditions.			
(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
Discussion: The Proposed Action will support Objective B of Section VIII of the City and County of Honolulu General Plan related to public safety. The development of the Proposed Action will incorporate various mitigation measures discussed in the drainage master plan included herein as Appendix D and discussed in detail in Section 3.16.3. Traffic impacts related to the Proposed Action are discussed in Section 3.12 of the EA, including parking demands and multi-modal improvements. Please note that a Traffic Impact Report, as well as a Traffic and Parking Management Plan were conducted in conjunction with the Proposed Action. Moreover, it is anticipated that all new facilities will be designed and constructed safely for its uses.			
IX. Health and Education			
Objective A. To protect the health of the people of O'ahu.			
(1) Encourage the provision of health-care facilities that are accessible to both employment and residential centers.			X

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(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
Discussion: The Proposed Action will not affect Objective A of Section IX of the City and County of Honolulu General Plan related to health and education.			
Objective B. To provide a wide range of educational opportunities for the people of O'ahu.			
(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		
Discussion: The Proposed Action will support Objective B of Section IX of the City and County General Plan relating to health and education. The UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retains current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers. In turn, the UHM students will enter the State's workforce and contribute to the overall economy for future generations. Moreover, the Proposed Action intends to organize campus space and investments to optimize utility, density, and economic performance by improving building utilization and occupancy; improving the overall facility portfolio effectiveness; create land banks for future use, such as R+D or Play Innovation Spaces; develop a long-term strategic energy management plan; and pursue revenue-generating developments and partnerships. The UH intends to reduce the total square footage by improving utilization and occupancy rates, increase space utilization and efficiency of class scheduling; increase the amount of collaborative space for meetings, study, or recreational activities to enhance on-campus life and the student experience; enhance the quality and quantity of research space; improve the circulation efficiency; decrease reliance on portables; and reduce deferred maintenance at the existing UHM campus. Hence, the UHM campus usage will be flexible and allow for high levels of use, including "after hours" usage.			
Objective C. To make Honolulu the center of higher education in the Pacific.			
(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		

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
Discussion: The Proposed Action will support Objective C of Section IX of the City and County General Plan relating to health and education. The UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retains current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers.			
X. Culture and Recreation			
Objective A. To foster the multiethnic culture of Hawai'i.			
(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**
Discussion: The Proposed Action will support Objective A of Section X of the City and County of Honolulu General Plan related to culture and recreation. The UH intends to create vibrant gathering spaces that can be the foundation of the UHM campus development. This includes supporting gathering spaces at all scales – formal and informal, and indoor and outdoor. Also envisioned is embedding digital capabilities (digital learning) into the gathering space experience including but not limited to, Wifi, Digital screens, and Dynamic lighting; and integrating international connections by hosting international gathering events, as well as integrating the local community into campus learning and cultural events. Pathways are twofold creating compelling public spaces for gathering and spontaneous interactions. Gathering spaces are designed to be flexible, serving multiple programmatic uses & demographics.			
Objective B. To protect O'ahu's cultural, historic, architectural, and archaeological resources.			
(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 funds, and public participation and support, to protect social, cultural, historic, architectural, and archaeological resources.			**X**

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(6) Provide incentives for the restoration, preservation, and maintenance of social, cultural, historic, architectural, and archaeological resources.			X
Discussion: The Proposed Action will support Objective B of Section X of the City and County General Plan related to culture and historical resources. No significant impacts to historic resources are anticipated for the Proposed Action. It is acknowledged that the results of the ARCA indicate that there are archeological historic properties that exist on the UHM campus and there is the potential for more to be identified. While the UHM campus has been altered to a large extent over the past century through agricultural practices, quarry activities, and the development of the existing UHM campus, it remains possible that subsurface archeological resources may exist at the UHM campus. However, applicable mitigation measure are recommended to minimize potential impacts. With regards to any renovation work being conducted as part of the Proposed Action that could potentially impact buildings considered historic (e.g., Sinclair Library), a historic review is recommended to be conducted prior to any alteration of identified buildings. As noted previously, the UH intends to create vibrant gathering spaces that can be the foundation of the UHM campus development. This includes supporting gathering spaces at all scales – formal and informal, and indoor and outdoor. Also envisioned is embedding digital capabilities (digital learning) into the gathering space experience including but not limited to, Wifi, Digital screens, and Dynamic lighting; and integrating international connections by hosting international gathering events, as well as integrating the local community into campus learning and cultural events. Pathways are twofold creating compelling public spaces for gathering and spontaneous interactions. Gathering spaces are designed to be flexible, serving multiple programmatic uses & demographics. Leveraging the UHM campus as a program opportunity would allow the UH to invest in the quality of campus life and citizenship which also means investing in a range of recreation opportunities including everything from the lo'i space, athletic fields, to hiking trails and outdoor eating spaces. Creating key areas and zones that serve the wider public as well as the immediate campus community will serve to heighten regional appreciation and awareness of UHM's research pursuits and increase the UH's civic value for decades to come. Moreover, The UH also intends to create vibrant gathering spaces that can be the foundation of the UHM campus development. This includes supporting gathering spaces at all scales – formal and informal, and indoor and outdoor.			
Objective C. To foster the visual and performing arts.			
(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
Discussion: The Proposed Action will support Objective C of Section X of the City and County of Honolulu General Plan related to culture and recreation. The Proposed Action will allow the UHM to provide much needed facilities to support the various programs offered at the UHM which will provide students the opportunity to be successful academically and professionally to pursue their socio-economic aspirations, including those within the various art programs at the UHM.			
Objective D. To provide a wide range of recreational facilities and services that are readily available to all residents of O'ahu.			
(1) Develop and maintain community-based parks to meet the needs of the different communities on O'ahu.			X

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
(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 schools 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
Discussion: The Proposed Action will not affect Objective D of Section X of the City and County of Honolulu General Plan related to culture and recreation.			
XI. Government Operations and Fiscal Management			
Objective A. To promote increased efficiency, effectiveness, and responsiveness in the provision of government services by the City and County of Honolulu.			
(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
Discussion: The Proposed Action will not affect Objective A of Section XI of the City and County of Honolulu General Plan related to government operations and fiscal management.			

Table 4-5: City and County of Honolulu: General Plan – Objectives and Policies	S	NS	N/A
Objective B. To ensure fiscal integrity, responsibility, and efficiency by the City and County government in carrying out its responsibilities.			
(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
Discussion: The Proposed Action will not affect Objective B of Section XI of the City and County of Honolulu General Plan related to government operations and fiscal management.			

4.2.2. Primary Urban Center Development Plan

The Project is located within the Primary Urban Center (PUC) Development Plan (DP) area, which extends from downtown Honolulu to Pearl City in the west to Wai'alae-Kahala in the east. The PUC is home to almost half of O'ahu's population and three quarters of all jobs. The Primary Urban Center Development Plan (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. The City's Land Use Map indicates that the project area lands are designated for Institutional uses. The proposed project is consistent with the following guidelines, policies and principles contained in the PUC Development Plan:

Table 4-6: Primary Urban Center Development Plan	S	NS	N/A
3. Land Use and Transportation			
3.1 Protecting and Enhancing Natural, Cultural, and Scenic Resources			
3.1.2 Policies			
Preserve historic and cultural sites. Preserve and protect sites that have high preservation value because of their good condition or unique features. Protection includes planning and design of adjacent uses to avoid conflicts or abrupt contrasts that detract from or destroy the physical integrity and historic or cultural value of the site. Retain, whenever possible, significant vistas associated with historic, natural and man-made features. Allow adaptive reuse of historic buildings to serve a new function and/or enhance interpretive value without destroying the historic value of a site.	X		
Preserve and protect natural resource and constraint areas. Establish an Urban Community Boundary to define the area for urban development. Place large contiguous areas of natural resource and constraint areas designated for Preservation, including all lands within the State Conservation District, outside of the Urban Community Boundary.			X
Preserve panoramic views of natural landmarks and the urban skyline. Preserve views of the Koolau and Waianae Mountain Ranges, Punchbowl, Diamond Head, Pearl Harbor and other natural landmarks. Maintain important view corridors within and across urban Honolulu and keep Downtown as the most prominent feature of the urban skyline. Views along the Pearl Harbor shoreline and the Pearl Harbor Historic Trail toward the mountains, shoreline, significant landmarks, and adjacent communities should be created and maximized wherever possible and appropriate.			X
Improve access to shoreline and mountain areas. Provide continuous lateral access along the Honolulu waterfront and around the East Loch of Pearl Harbor, where urban activity is most intense. Maintain access to mountain hiking trails and increase opportunities for nature education and camping.			X

Table 4-6: Primary Urban Center Development Plan	S	NS	N/A
Provide parks and active recreation areas. Develop and maintain parks and other outdoor public spaces in a manner that expands opportunities for both active and passive recreation. Increase and enhance recreational open space in the most densely settled parts of the PUC.	X		
Discussion: The Proposed Action will support historic and cultural sites relating to Section 3.1.3.1. No significant impacts to historic resources are anticipated for the Proposed Action. It is acknowledged that the results of the ARCA indicate that there are archeological historic properties that exist on the UHM campus and there is the potential for more to be identified. While the UHM campus has been altered to a large extent over the past century through agricultural practices, quarry activities, and the development of the existing UHM campus, it remains possible that subsurface archeological resources may exist at the UHM campus. However, applicable mitigation measure are recommended to minimize potential impacts. With regards to any renovation work being conducted as part of the Proposed Action that could potentially impact buildings considered historic (e.g., Sinclair Library), a historic review is recommended to be conducted prior to any alteration of identified buildings. The UHM's landscape is one of its most valuable and distinctive attributes, the UHM's goal is to celebrate its unique natural assets and reduce impervious surfaces. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources. One of the UHM's goals is to create a living campus that supports community and student well-being. This will include services for students, staff, and faculty as well as members of the local community, and a long-term emphasis on encouraging development of student and faculty housing on and near campus. Leveraging the UHM campus as a program opportunity would allow the UH to invest in the quality of campus life and citizenship which also means investing in a range of recreation opportunities including everything from the lo'i space, athletic fields, to hiking trails and outdoor eating spaces. Creating key areas and zones that serve the wider public as well as the immediate campus community will serve to heighten regional appreciation and awareness of UHM's research pursuits and increase the UH's civic value for decades to come. Moreover, The UH also intends to create vibrant gathering spaces that can be the foundation of the UHM campus development. This includes supporting gathering spaces at all scales – formal and informal, and indoor and outdoor.			
3.2 Neighborhood Planning and Improvement			
3.2.2 Policies			
3.2.2.1 Neighborhood Planning			
Develop a system for collaborative neighborhood planning. Planning for neighborhood improvement must be undertaken at the neighborhood level. Neighborhood planning is a collaborative enterprise involving residents, business and property owners, government agencies, and others who have a stake in the neighborhood.			X
Cultivate existing and new "neighborhood centers." Neighborhoods need central places where people gather for shopping, entertainment, and/or recreation. The center of a neighborhood could be a public plaza or a recreation complex, or a commercial town center, with a grocery store and other shops and services. It could have a public park or a plaza linked to shops. Cultivating neighborhood centers entails investment in parks and pedestrian street improvements.			X
Promote mixed land uses. Office, retail, and community service uses can coexist with residential uses; and there are a number of opportunities for them to support each other. In traditional single-family neighborhoods, groupings of small stores provide convenient service and a place to meet neighbors. In the PUC's in-town neighborhoods, both residential and office development support retail and other services. Neighborhoods with a strong mix of uses have activity 24 hours a day. Residences providing "eyes on the street" contribute to neighborhood safety.			X

Table 4-6: Primary Urban Center Development Plan	S	NS	N/A
Create parks that draw people and activity. The PUC should have a range of parks. While all provide open space and relief from buildings and traffic, some should provide for organized sports and fitness activities, and others should function more as neighborhood gathering places. In the PUC, development of one or two large sports complexes with substantial parking could provide for league play of all kinds, while smaller parks could be used in inventive ways to meet the needs of their surrounding neighborhoods. Like other cities throughout the world, plazas and open spaces that attract people and activity are integrated with churches, shops, and other buildings.			X
Make streets "pedestrian-friendly." There are many opportunities to create street environments that invite pedestrian use, such as widening sidewalks, planting trees to provide shade and buffer pedestrians from vehicular traffic, and narrowing intersections to provide shorter and safer pedestrian crossings. The Land Use Maps (Maps A.4, A.5 and A.6) show primary pedestrian routes. These streets and others identified through neighborhood planning should be given high priority for pedestrian improvement.			X
Make major streets which connect communities convey neighborhood identity. The identifying characteristics that give neighborhoods their unique visual signatures or identities should be emphasized and conveyed by the streets that connect them to other places. To help accomplish this, landscape and other streetscape design for major streets which serve as principal routes connecting two or more neighborhoods should reflect the unique identities of each neighborhood and, where possible, should provide open spaces between them which create significant public views or access to mauka or shoreline resources.			X
3.2.2.2 Mauka Residential Neighborhoods			
Density. Lower-density residential areas may have single-family residences and townhouse apartments at a density of five to 12 dwelling units per acre, with predominantly two-story building heights. Areas zoned for apartment use may have higher densities.			X
Appropriate Building Design. For institutional and other nonresidential uses allowed within lower-density residential areas, provide guidelines for the location and design of buildings, service areas, and pedestrian and vehicular access. In general, street-facing building elements should be attractive, designed for human scale, and have clear points of entry. Service and utility elements should be located out of sight from the street and away from residences.	X		
3.2.2.3 In-Town Residential Neighborhoods			
Density. Areas close to transit lines and the major east-west arterials should be zoned for medium-density residential, which may range from 13 to 90 units per acre, or high-density residential mixed use, which may range up to 140 units per acre. Neighborhoods in these zones would also include reinforcing uses which support resident lifestyle and livelihood choices, such as convenience or neighborhood stores, dining establishments, professional and/or business services, or other similar activities.			X
Building Heights. Establish maximum desired building heights in apartment-zoned districts on the basis of viewplane studies to preserve views of natural landmarks as indicated in Section 3.1. Otherwise, the maximum building height for districts zoned low-density apartment should be approximately four stories or 40 feet. For areas zoned medium-density apartment, the maximum desired building height should be either 60 feet or the present height of the building occupying the lot. It is expected that with these criteria, building heights for most in-town residential neighborhoods, including Moiliili, McCully, and other established neighborhoods between Ala Moana and the University of Hawaii would not exceed currently allowed heights. Given market conditions, development feasibility, and future incentives and standards encouraging	X		

Table 4-6: Primary Urban Center Development Plan	S	NS	N/A
the enhancement and development of livable neighborhoods, such districts may experience lower than currently sanctioned building heights.			
Building Design and the Streetscape Environment. Neighborhood plans should distinguish between principal or "front door" streets that give a neighborhood the opportunity to "put on its best face," and secondary or local streets where a variety of activities are appropriate or where service is the main function. Utilitarian elements such as service yards, parking lots, or utilities should be located on nonprincipled streets in ways that support efficient patterns of circulation.	X		
3.2.2.4 Shopping and Retail Business Districts			
Community/Neighborhood Commercial. These commercial areas should be located within and should primarily serve lower-density residential neighborhoods. Generally 10 acres or less in land area, these districts or clusters of establishments typically have service stations, grocery and sundry stores, and other small businesses serving residential customers. Buildings are generally one or two stories in height. While they vary greatly in total size and number of business establishments, a Community/Neighborhood Commercial area typically has no more than 200,000 square feet of commercial floor area.			X
District Commercial. District Commercial includes a wide variety of commercial uses located in the core areas of the Primary Urban Center. These districts typically have larger facilities and serve larger populations than community/neighborhood commercial districts. They may include major office buildings, shopping centers, and older commercial streets that serve a district-wide, regional or island wide population. Mixed uses, including medium to higher density residential uses where appropriate, and higher densities are encouraged in these areas. Downtown should have the tallest buildings on Oahu. In other areas, maximum building heights should be established on the basis of viewplane studies to preserve views of natural landmarks.			X
Commercial streets. Enliven commercial streets by providing wide sidewalks and trees for shade and encouraging property owners to build to the sidewalk edge. Vital urban neighborhoods rely on high pedestrian activity. Storefronts create interest and stimulate pedestrian activity along the street, especially when they are built to the property line and meet the public sidewalk.			X
District-wide parking. Support older commercial districts and the continued use and rehabilitation of small commercial lots by providing conveniently located municipal parking. In the past, the City organized parking improvement districts and built centralized parking in Downtown and Kaimuki.			X
Integration of shopping centers with adjacent neighborhoods. Ensure that all shopping areas integrate well with adjacent residential neighborhoods. Require safe, pleasant, pedestrian connections between shopping establishments and their host neighborhoods. Encourage the planning and development of centers or clusters of shopping establishments to have their shops rather than parking lots face and be adjacent to abutting neighborhoods. Wherever possible and appropriate, encourage compatible or seamless design and landscape treatment of public routes and thoroughfares between residential and shopping areas. To the greatest extent possible, avoid placing service uses adjacent to resident areas and major frontages. Efforts should be made to appropriately locate and distinguish between front door and service zones.			X
Discussion: The Proposed Action will support the policies of 3.2.2.1 through 3.2.2.3 of the PUCDP. The Proposed Action will be subject to a PRU Major Modification Permit which will require it to various building design elements at the UHM campus, particularly those along the periphery of the UHM campus, abutting surrounding land-uses.			

Table 4-6: Primary Urban Center Development Plan	S	NS	N/A
3.3 In-Town Housing Choices			
3.3.2 Policies			
Promote people-scaled apartment and townhouse dwellings in low- or mid-rise buildings oriented to the street. Promote buildings that are modest in height and have a pedestrian entrance facing the street. Encourage the use of ground-floor space for shops that will serve residents and contribute to a pedestrian-oriented neighborhood. This policy entails revising zoning regulations.			X
Improve the feasibility of redeveloping small lots. Remove disincentives for townhouse and low-rise apartment development on smaller lots zoned for multifamily dwellings. This policy entails revising zoning regulations.			X
Reduce costs for apartment homes. Reduce construction costs and promote low-rise buildings by allowing less expensive building construction types while maintaining health and safety. Reduce land costs by allowing greater dwelling unit density while limiting building volume consistent with promoting livable neighborhoods. This policy entails revising building and zoning regulations.			X
Provide adequate parks and schools for in-town neighborhoods. Community parks and recreation facilities should be provided in and near residential neighborhoods. To attract young families, access to elementary schools must be assured.			X
Expand the capacity of infrastructure, including water supply, sewers, and storm drains. Government needs to lead both planning and investment in renewing and expanding infrastructure. To remedy district- or neighborhood-scale infrastructure constraints is beyond the capability of individual landowners. Likewise, paying for relief lines and larger-scale projects that will benefit multiple landowners requires government leadership in providing long-term financing and apportioning costs.			X
Support the retention, rehabilitation, and improvement of older, low-rent apartment buildings. Many older, walk-up apartment buildings constructed prior to the 1969 Comprehensive Zoning Code do not conform to current zoning or building standards but collectively comprise a valuable reservoir of low-cost rental housing. The City should relax zoning requirements to encourage the rehabilitation and improvement of these buildings.			X
Preserve the current inventory of affordable rental housing units. 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 rentals.			X
Provide for special needs housing. Allow housing for people with special needs, such as group homes for the disabled or congregate living and care homes for the elderly, subject to special development standards or permit review. Promote the dispersal of special needs housing among various neighborhoods and avoid overconcentrating facilities in just a few areas.			X
Provide incentives and cost savings for affordable housing. Provide exemptions from zoning and building codes for housing projects that meet established standards of affordability, on a case-by-case basis.			X
Provide for high-density housing options in mixed-use developments around transit stations. This type of "transit-oriented development" facilitates transit use and allows for increased densities without generating increased vehicular congestion.			X
Discussion: The Proposed Action will not affect the policies and objective for the PUCDP relating to In-Town Housing choices.			
3.4 The Pacific's Leading City			

Table 4-6: Primary Urban Center Development Plan	S	NS	N/A
3.4.2 Policies			
3.4.2.1 Honolulu and Pearl Harbor Waterfronts			
Create public open space along the Pearl Harbor waterfront and strengthen the physical and visual connections between the urban center and the water			X
Improve mauka-makai pedestrian and bicycle circulation across Kamehameha Highway. Developing physical access to the Pearl Harbor waterfront demands substantial improvements to pedestrian and bicycle access across Kamehameha Highway.			X
Redevelop the Downtown/Iwilei waterfront. Reroute through traffic to a new Sand Island parkway and harbor tunnel thoroughfare, and replace the makai portion of Nimitz Highway with a new shoreline pedestrian promenade and mixed-use commercial/recreational/residential complexes. Adopt appropriate measures to enhance the attractiveness of the Nimitz corridor and public and private responsibilities to implement and maintain such improvements. By creating a new parkway across Sand Island and a tunnel beneath the Harbor entrance, Airport-to-Waikiki traffic (and all other through traffic not destined for the Iwilei/Downtown area) will bypass this unsightly industrial section and significantly reduce the traffic demand on Nimitz Highway through town. This will enable the Ewa-bound mauka section of the highway to be converted to a two-way local access street. It will also allow the Waikiki-bound makai section to be converted to a major shoreline promenade and waterfront activity area, providing space for restaurants, shops, indoor and outdoor entertainment, and recreation areas. This area would also hold potential for development of low- to mid-rise housing.			X
3.4.2.2 Visitor Facilities			
Adopt and implement a plan for a vibrant and livable Waikiki. This plan needs to address the quality of the resident experience as well as the quality of the visitor experience. Based on development parameters set by the Waikiki Special District, the plan should encompass mobility, the quality of the street environment for pedestrians, public spaces, the scale and design of new buildings, and Waikiki's relationship to the Convention Center and neighboring districts.			X
Support attractions that are of interest to both residents and visitors in the Ala Moana/Kakaako/Downtown corridor. Opportunities include State sponsored waterfront commercial and cultural attractions around the Kewalo Basin area; retail/entertainment facilities around Ala Moana Center, Victoria Ward Centers and Kamehameha Schools properties; and improvements to serve visitors in the Capitol District, Aloha Tower, and Chinatown.			X
Provide opportunities for the development of visitor units in the Ala Moana/Kakaako/Downtown corridor. Hotels serving the Convention Center should be within a 5-minute walk (one-quarter mile) and located on commercially zoned parcels along major thoroughfares. Those in the Downtown area should be in the area zoned BMX-4 or the Aloha Tower complex.			X
Provide a transit link along the Ala Moana/Kakaako/Downtown corridor. The City should assure that there is convenient transit service between visitor accommodations and the visitor attractions along the corridor. Visitor oriented transit should utilize at-grade trolley types of vehicles and could be publicly or privately operated.			X
Provide opportunities for the development of smaller-scale visitor accommodations (i.e., inns and lodges) in existing commercial centers. These could serve resident and business needs (visiting family, friends and business associates) as well as visitors looking for an alternative to the resort enclave. Potential areas include Kapahulu, Kaimuki, the King/Beretania corridor, Kapalama, Pearlridge, and Pearl City.			X

Table 4-6: Primary Urban Center Development Plan	S	NS	N/A
Development of such facilities should consider the community's preferences and be integrated with the surrounding neighborhood.			
Allow Bed & Breakfast establishments (but not transient vacation units or TVU's) in residential neighborhoods. With adequate parking, community involvement, and other regulatory controls, B&Bs provide a highly integrated, well-supervised, low-impact form of visitor accommodation. For residents, operating a B&B is a viable home occupation and a means to retain and reuse homes in older neighborhoods.			X
3.4.2.3 Technology Business, Office Facilities			
Stimulate development of high technology and knowledge-based industries. Take advantage of Honolulu's active urban ambience to attract high-technology businesses. Use State lands in Kakaako for a campus dedicated to biomedical research and other high-technology businesses. Encourage investment in infrastructure in commercial buildings to accommodate and attract high-technology and biotechnology businesses.			X
Encourage street-front retail. Office buildings should have retail stores, entrances, and windows fronting the principal street.			X
Provide usable open space. Zoning requirements and bonus provisions for open space associated with larger office buildings should specify design guidelines for usable plazas, parks, and arcades. Key elements of usable open space are enclosure, shade, seating, and location at street level.			X
3.4.2.4 Military, Airport, Harbor, and Industrial			
Support continuation of military uses. National defense objectives and budget priorities determine the military bases and functions located in the Primary Urban Center and the state as a whole. The City should support long-range land use planning by the military services and coordinate with them to achieve common goals of employment, housing, and recreation.			X
Integrate civilian and military residential communities. The City should work with the military services to link adjacent residential communities through the use of connecting roadways, bikeways, walkways, landscape features, and/or architectural scale and character.			X
Allow a mix of industrial and commercial uses. Allow a broader mix of commercial uses in the Airport and Bougainville industrial districts. The Airport district should include office, hotel, and retail uses that are compatible with airport operations, as well as existing light industrial uses. The Bougainville district should include uses that support surrounding residential neighborhoods.			X
Enhance Honolulu Harbor and harbor-related uses. Reserve areas around Honolulu Harbor, particularly around Kapalama Basin and the Sand Island container yards, for harbor-related uses.			X
Support industrial uses in Kalihi-Palama industrial districts. Commercial uses along the Nimitz, Dillingham, King, Kalihi, and Waiakamilo corridors should be recognized and encouraged. In industrial districts where residential uses have endured for many years – i.e., Kalihi Kai and Kapalama – such uses should be allowed to continue, and should be rehabilitated and improved.			X
Promote compatibility with the surrounding urban and natural environment. Where industrial uses are mixed with or adjacent to residential communities or natural areas, mitigate visual, noise, and other environmental impacts by adopting performance standards.			X
Support development of adequate warehousing facilities to support increased economic activity. Encourage development and maintenance of warehouse space of sufficient quality to prevent shortages and support growing businesses.			X

Table 4-6: Primary Urban Center Development Plan	S	NS	N/A
3.4.2.5 Aiea-Pearl City Town Centers			
Define the role of town centers. Establish the "Pearlridge" area as the Pearl Harbor Regional Town Center, and strengthen the physical and visual connection between this urban activity center and the Pearl Harbor waterfront. Other town centers at Pearl City, Waimalu, Aiea, and Halawa should serve as more localized or specialized activity and service areas.			X
Promote mixed land use. Town centers should support some form of mixed land use to respond more flexibly to market needs and to reduce dependency on the private automobile for local travel. The Pearl Harbor Regional Town Center should be designated for a greater diversity of uses than the other town centers, emphasizing an integration of medium- or higher-density residential and commercial development. Land use designations and design standards should be oriented toward assuring compatibility of building forms and uses, creating street connections, and providing a smooth transition between town centers and adjacent residential neighborhoods.			X
Facilitate pedestrian, transit, and bicycle improvements. There should be major improvements to transportation facilities and services, with particular emphasis on pedestrian, bicycle, and public transit modes along Kamehameha Highway, and commuter travel on the H-1 Freeway and in the Aloha Stadium vicinity (see Figure 3.17: Pedestrian Network Concept for Pearl Harbor). Design standards for new development in the town centers – especially the Pearl Harbor Regional Town Center – should encourage pedestrian and transit travel.			X
Discussion: The Proposed Action will not affect the objectives and policies of the PUCDP relating the Pacific's leading city.			
3.5 Develop a Balanced Transportation System			
3.5.2 Policies			
Implement land use strategies to achieve a balanced transportation system. To improve the quality of life in the Primary Urban Center and to accommodate growth, development initiatives and regulatory controls should promote the growth of sustainable and appropriate alternative urban travel modes such as transit, walking, and bicycling.	X		
Improve the public transit system, including development of a rapid transit component. Improvements to the transit system should be targeted to accommodating trans-PUC travel and making neighborhood service more convenient. A rapid transit component is needed to serve the high-volume east-west corridor, connect activity centers, and provide transportation capacity in place of increased roadways.			X
Implement Transportation Demand Management strategies. Due to limited land area and high costs, it is increasingly necessary to shift from increasing roadway and parking capacity to policies and practices that reward use of transit and other alternative modes.	X		
Review existing plans and establish priorities for roads and road improvements. Conduct a comprehensive review of roads and designate those which should receive priority treatment for transit, bike routes, and pedestrian routes, as well as the principal arterial and collector network for automobile travel.			X
Implement the Honolulu Bicycle Master Plan. Institutionalize the policy that every street and highway on which bicycles are permitted to operate is a "bicycle street," designated and maintained to accommodate shared use by bicycles and motor vehicles.			X
Enhance and improve pedestrian mobility. Create special pedestrian districts and corridors and a regional network of pedestrian facilities. Comprehensively address	X		

Table 4-6: Primary Urban Center Development Plan	S	NS	N/A
pedestrian safety concerns related to vehicle speeding and excessive volumes on local streets and neighborhood collector streets.			
Encourage the full use of existing private and public parking garages. Encourage private parking garage owners to rent underused parking stalls within commercial buildings and large-scale residential projects.			X
Discussion: The Proposed Action supports the objectives and policies of the PUCDP relating to developing a balanced transportation system. The UHM is striving to transform from a commuter campus to a pedestrian-centered place of learning. To achieve this goal, the UHM intends to reduce parking accommodations; prioritize pedestrian pathways and wayfinding on the Central Campus; develop alternative transit solutions to one-driver-one-car such as a transit hub, developing an off-campus parking strategy, and anticipating future mobility changes; and create velocity-based on-campus hierarchy of circulation. In the near-term, this will involve relocating parking and vehicular circulation from the core of the central campus to the periphery. In the long term, the University will develop, promote, and support alternatives to commuting via private vehicles, which may include ridesharing, enhanced public transit, an expanded UHM shuttle system, human-powered and motorized bicycles and scooters, autonomous vehicles, and the possible extension of rail to the UHM campus.			
4. Infrastructure and Public Facilities			
4.1 Water Allocation and System Development			
4.1.2 Policies			
Integrate resource management of all potable and nonpotable 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
Discussion: The Proposed Action will support Section 4.2.1 of the Primary Urban Development Plan. As noted by the BWS, all new developments are required to have water conservation measures which may include utilization of nonpotable water, drought tolerant plants, xeriscape landscaping, etc.			
4.2 Wastewater System			
4.2.2 Policies			
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
Discussion: The Proposed Action will support Section 4.2.2 of the Primary Urban Development Plan. It is anticipated that the existing wastewater systems will be improved due to the Proposed Action as noted by the Sewer Master Plan included herein as Appendix B and discussed in Section 3.16.2.			

Table 4-6: Primary Urban Center Development Plan	S	NS	N/A
4.3 Electrical Power			
4.3.2 Policies			
Support retention and upgrade of the Waiau and Honolulu Power Plants as part of a strategic plan to improve the reliability of the Primary Urban Center'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
Discussion: The Proposed Action will not have an effect on Section 4.3.2 of the Primary Urban Development Plan.			
4.4 Telecommunications Facilities			
4.4.2 Policies			
Minimize the visual impacts and potential health hazard of new facilities.			X
Discussion: The Proposed Action will not have an effect on Section 4.4.2 of the Primary Urban Development Plan.			
4.5 Solid Waste			
4.5.2 Policies			
Reduce the solid waste stream by encouraging recycling and reuse.			X
Reduce dependence on landfills by encouraging alternative waste disposal technologies.			X
Discussion: The Proposed Action will not have affect Section 4.5.2 of the Primary Urban Development Plan.			
4.6 Stormwater Systems			
4.6.2 Policies			
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. (City Council Resolution No. 94-296).			X
Manage stormwater flows through best management practices to minimize stormwater runoff and peak discharge rates.	X		
Preserve stream and estuarine habitats.			X
Discussion: The Proposed Action will support Section 4.6.2 of the Primary Urban Development Plan.			

Table 4-6: Primary Urban Center Development Plan	S	NS	N/A
The development of the Proposed Action will incorporate various mitigation measures discussed in the drainage master plan included herein as Appendix D and discussed in detail in Section 3.16.3.			
4.7 School and Library Facilities			
4.7.2 Policies			
Support the development of a high quality educational system of schools and post-secondary institutions that increase the attractiveness of the Primary Urban Center as a place to live and work.	**X**		
Work with the Department of Education to develop innovative shared-use facilities, particularly on City-owned school properties.			**X**
Discussion: The Proposed Action will support Section 4.7.2 of the Primary Urban Development Plan. The UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retain current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers. Increasing the attractiveness of the UHM campus will increase the overall attractiveness of the Primary Urban Center.			
4.8 Civic and Public Safety Facilities			
4.8.2 Policies			
Provide adequate staffing and facilities to ensure effective and efficient delivery of basic governmental service and protection of public safety.			**X**
Discussion: The Proposed Action will not have an effect on Section 4.6.2 of the Primary Urban Development Plan.			

4.2.3. City and County of Honolulu Zoning

The purpose and intent of the CCH Land Use Ordinance (LUO) is to regulate land use in a manner that will encourage orderly development in accordance with adopted land use policies, including the O'ahu General Plan and development plans, and to promote and protect the public health, safety, and welfare. Hence, the LUO is the CCH's zoning code.

Discussion:

According to the City and County of Honolulu Department of Planning and Permitting (DPP) LUO, the Proposed Action is situated within the R-5 and R-7.5 Residential designated zones with smaller portions of the UHM campus situated in the P-1 and P-2 Preservation zones (See Figure 4-3). The City & County of Honolulu, Department of Planning and Permitting would generally administer zoning regulations under its LUO.

However, following this EA process, the Proposed Action is subject to the Plan Use Review process pursuant to Table 21-3 of the LUO. The Proposed Action would then be regulated by the development standards described therein, which supersede the City and County zoning regulations.

4.3. Permits and Approvals

The following is a list of permits, approvals, and reviews that may be required prior to implementation of the Proposed Action.

State of Hawai'i

Department of Land and Natural Resources
- Chapter 6E, HRS, State Historic Preservation Law

Department of Health
- National Pollutant Discharge Elimination System
- Disability and Communication Access Board
- Pollution Control - Noise Permit

City and County of Honolulu

Department of Planning and Permitting
- Plan Review Use Major Modification
- Plan Review Use Minor Modification
- Building Permits
- Grading Permit/Trenching Permit
- Certificate of Occupancy
- Construction Dewatering
- Wastewater Sewer Connection Applications
- Stormwater Drain Connection
- Excavation and Repair of Streets and Sidewalks

Board of Water Supply
- Water System Facilities Charges
- Cross-Connection Control Requirements
- Backflow Prevention Requirements

Department of Transportation
- Street Usage Permit

Honolulu Fire Department
- Plan Review

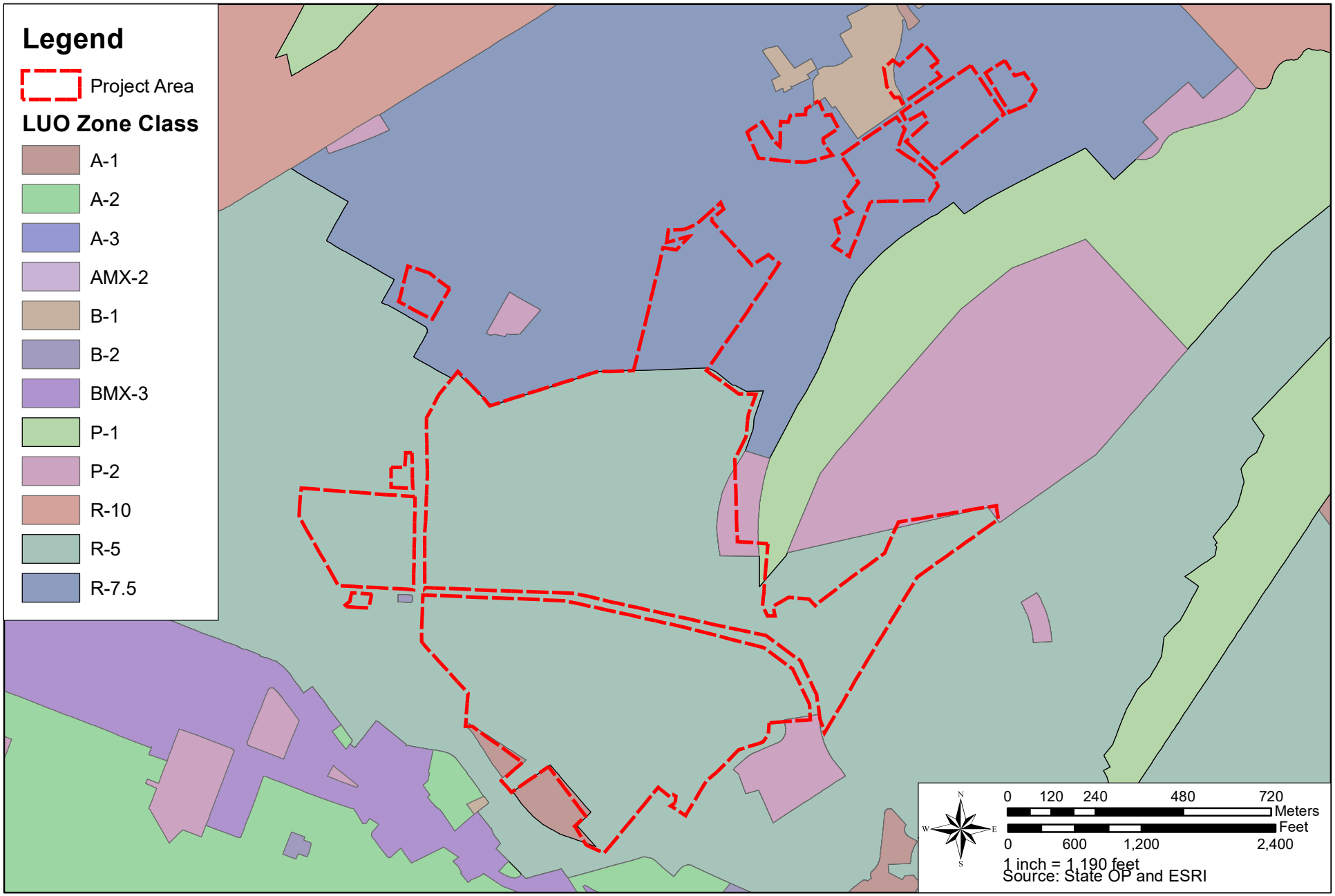

FIGURE 4-3

CITY AND COUNTY OF HONOLULU ZONING MAP

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Chapter 5:

Alternatives

CHAPTER 5: ALTERNATIVES

5. ALTERNATIVES

Under § 11-200.1-18, HAR an EA is required to present a discussion of the consideration of project alternatives that could reasonably attain the goals and objectives of the Proposed Action.

As referenced earlier herein, the goals and objectives of the Proposed Action are to:

1. Reduce SF and optimize infrastructure, facility, land, and resource use;
2. Transform circulation and mobility;
3. Strengthen the gathering experience;
4. Become a living and learning lab;
5. Activate landscape and campus character;
6. Provide for the campus 'ohana; and,
7. Build resilience

In observance of these stated goals and objectives, the UH considered a range of alternatives, including: (1) the Proposed Action (a detailed description of the Proposed Action is provided in Chapter 2 and an assessment of the anticipated environmental impacts of the Proposed Action is provided in Chapter 3); (2) consideration of the build out and implementation of various unimplemented projects from the 2007 LRDP; and, (3) implementation of other projects that were considered but did not meet the necessary criteria established in the 2019 LRDP methodology; and, (4) the No Action alternative.

In addition, alternatives to several projects / key initiatives were also considered, specifically: (5) alternative seating configurations for the Clarence T.C Ching Athletic Complex Temporary Phase 2 Expansion; and, (6) alternative PV implementation schemes.

The "No Action" alternative constitutes a scenario whereby none of the projects described in the LRDP would be implemented. In other words, the UHM campus would remain as it currently exists now. General assessment of the No Action alternative clearly underscores that maintaining the status quo would not meet the spirit and intent of the objectives of the Proposed Action or speak to the functional purpose of the UH as the State's chief higher learning institution.

5.1 Implementation of Undeveloped 2007 LRDP Projects

As noted in Section 1.1, the previous 2007 LRDP was largely ambitious in terms of campus development and expansion, with a total of 17 projects envisioned under Category 1 (constructed within 5-10 years) and another 17 projects envisioned under Category 2 (constructed beyond 10 years) (Group 70 International, 2007). Of the Category 1 projects, the addition of approximately 2,680,000 SF to campus wide facility inventory was permitted under the 2009 PRU permit that followed the 2007 LRDP. Notably, however, since 2007, only six major projects along with some minor projects and temporary portable buildings have actually been constructed. In hindsight, the scale of development envisioned under the 2007 LRDP outpaced actionable procurement and project delivery, and the overall vision set forth could not have been reasonably accomplished in the 10-year period that it forecast.

Table 5-1, below, outlines the projects identified in the 2007 LRDP that were and were not constructed since approval of the PRU permit (No. 2009/PRU-3) in 2010.

Table 5-1 – Status Summary of 2007 LRDP Projects

Proposed Facilities (Within 5-10 Years)		Project Status
1A	Kennedy Theatre Expansion	Not Constructed
1B	Parking Structure at Kennedy Theatre	Not Constructed
2	Instruction Building at Henke Hall Site	Constructed
3	Campus Center Expansion to Northeast	Constructed
4	Law School Library Expansion	Partial
5	I.T.S. – Bilger Hall Addition, Phase II	Constructed
6	Research Space – Infill South Courtyard of Biomedical Building	Constructed
7	Klum Gym Replacement	Not Constructed
8	Instruction Building – College of Education	Not Constructed
9	Media Facilities at KHET Site	Not Constructed
10	Parking Structure IIB/Bookstore	Not Constructed
11	Faculty Housing – Wa'ahila Ridge or Mauka Campus	Not Constructed
12	Research Buildings – North and East of Biomedical Building	Not Constructed
13	Research Buildings – Mauka Campus	Not Constructed
14	Johnson Hall – Replacement Dormitory	Not Constructed
15	Hale Noelani – Replacement Dormitory	Not Constructed
16	School of Hawaiian Knowledge	Partial
17	Transitional Space Building	Not Constructed

Pursuant to the 2019 LRDP Process, the UH reflected upon, and considered continuing constructing the projects listed under the 2007 LRDP. However, with the experienced and foreseen stabilization of the campus population and limited fiscal resources available for new facilities, the UH shifted the focus of its 2019 LRDP to optimization of deferred maintenance needs and underscoring renovations to modernize their existing campus. By repurposing and renovating existing facilities to accommodate a broader base of users and multiple disciplines, the UHM seeks to maximize the use of existing space and operate within the projected gross square footage set forth in the 2007 LRDP/2009 PRU. Moreover, the UH Board of Regents established a goal to reduce approximately 1 million SF from the overall Statewide UHM inventory. The UH intends to meet this goal through improvements in facility utilization, application of appropriate space standards, removal of inefficient and aging facilities, and rightsizing existing facilities. Hence, continuing to build out the campus, as the 2007 LRDP intended to do, would be contrary to the goal and objectives of the Proposed Action. Thus, this alternative was dismissed from further consideration.

5.2 2019 LRDP Methodology - Other Projects Considered

The UHM considered several different projects for the 2019 LRDP, however, not all of the projects considered met the criteria set forth for the 2019 LRDP. Other projects considered included (a) Replacement of the former PBS building to accomodate the Acedemy of Creative Media and Communications program, (b) a significant alteration to Holmes Hall and a new building to accomodate an expansion of the College of Engineering, (c) New academic building at the site of the current Kuykendall Hall, and (d) New academic building on the unimproved land directly mauka of Kennedy Theater.

Replacement of the Former PBS Building to Accomodate the Acedemy of Creative Media and Communications Program.

This project would demolish the existing former PBS facility at the corner of University Avenue and Dole Street and replace it with a modern facility designed to support the Academy of Creative Media (ACM) and the UHM's Communications program. The facility would include large soundstages, recording studeios, and other spaces and quipment to support film making and broadcast journalism. The project was determined to be in conflict with the UH's goal to reduce total campus square footage, would have created space that did not meet the UHM's target requirement for utilization, and would have violated the UH System's Integrated Academic and Facility plan.

Alteration to Holmes Hall and a New Building to Accommodate an Expansion of the College of Engineering.

The UHM conducted a Needs Assessment with the College of Engineering and determined that the space needs for the College could be accomodated through a series of less invasive renovation projects to Holmes Hall and more effective scheduling of campus-wide classroom resources, which ultimately led to the current plan to renovate Holmes Hall.

New Academic Building at the Site of the Current Kuykendall Hall.

This project was originally envisioned as a replacement academic building for the aging Kuykendall Hall. The University conducted a classroom utilization and occupancy study and determined that it could accomodate its course roster in fewer classrooms through better scheduling. The UH Board of Regents adopted a policy requiring higher classroom utilization, reducing the total demand for classroom spaces on campus. Hence, the Kuykendall Renovation project (discussed in Section 2.2.2.2) was included within the Proposed Action. However, the Kuykendall Replacement Project would replace the current two-part building with a modern facility of equal or less square footage. The new facility was not anticipated to exceed the existing facility's height and mass. Programmatic use of the building would be similar to current use with no change in planned occupancy. Thus, this project would not have any anticipated impacts

New Academic Building on the Unimproved Land Directly Mauka of Kennedy Theater.

This project would have extended the makai boundary of McCarthy Mall (formed by the Art Building, Bilger Hall, and Keller Hall) and provided additional faculty office and instructional space. An analysis of space needs for the UHM campus as part of the Framework Plan and LRDP development determined that the additional space was not necessary for successful educational delivery and would be in conflict with the stated goals and objectives of the Proposed Action.

5.3 Clarence T.C. Ching Complex Alternatives

Several different seating capacity alternatives were considered with regards to specifically accommodating the needs of the UH Football Program and expanding the functional utility of the Clarence T.C. Ching Athletic Complex to best serve the UH as a whole. Various design concept options considered as part of the iterative design and planning exercise undertaken by the UH are presented below in Table 5-2.

Table 5-2 Summary of Clarence T.C. Ching Athletic Complex Temporary Phase 2 Expansion Concept Options

Phase 1 Existing	**9,350 (Total Stadium Capacity Following Phase 1)**
Phase 1.5	753 (Remove 1,237 Ewa - Add 1,990 Ewa)
Phase 2 Estimate at Phase 1	7,750 (Makai Upper - Option A)
Phase 2 Option B	11,250 (5,000 Makai - 6,250 Ewa)
Phase 2 Option C	16,625 (5,000 Makai - 6,250 Ewa - 6,484 Mauka)
Phase 2 Concept Option 1	6,897 (Makai Upper)
Phase 2 Concept Option 2	6,636 (Footprint conformed to 10' setback)
Phase 2 Concept Option 3	8,887 (3,512 Makai Upper - 5,375 Ewa Expanded)
Phase 2 Concept Option 2 *Revised*	6,495 (Makai Upper - *Preferred option developed*)
Phase 2 Makai 3-Level Option	(2 added levels above Makai Ph1 - Expanded Upper Concourse)
Phase 2-Track Removal Option	7559 (Remove 3,641 Capacity, Add 7,559 at Mauka, Ewa)
Phase 2 Final Preferred Option	**7,759 (New Ewa, New Mauka)**
Total Proposed Capacity	**16,909 (Estimated Total Capacity Following Phase 2)**

Following Phase 1 and 1.5, three initial seating expansion locations (A,B,C) were studied for estimated total additional capacity in Phase 2. Option A studied expansion in the Makai Upper location only; Option B also further expanded the 'Ewa location; Option C further expanded both 'Ewa and Mauka sides. Phase 2 Concept Design primarily developed within location Option A, above the Phase 1 Makai Grandstands and Hospitality Box. Expansion options including constructing over the top of the existing Ching Stadium grandstand were ruled out in early phases because of feasibility. Options to expand to the 'Ewa and Mauka side of the existing Ching structure were also explored and eliminated due to extensive utilities on the 'Ewa side, and a recently constructed volleyball courts and seating on the Diamond Head side of the stadium.

Phase 2 Concept Options 1, 2 and 3 were studied to maximize capacity within available area behind and above existing structures on primarily the Makai side. Option 1 expanded a single level of Makai Upper seating with a uniform rectangular footprint; Option 2 conformed to a 10' setback perimeter along existing Makai structures; Option 3 further studied expansion over the 'Ewa end zone and track. Option 3 was eliminated early on as this would be likely to damage the new track and field surfaces, along with requiring runners to run under the grandstand structure. Inquiries to the DPP indicate that there is no precedent for extending the grandstand above an adjacent building so squaring off the building seems unfeasible due to the cantilever or additional structural members that would be required to go through the existing P.E. Athletics building. Option 2 was selected by the team for further refinement. The footprint of this option is guided by the 2017 ICC 300 Standard on Bleachers, Folding and Telescopic Seating, and Grandstands, which indicates that the setback between existing buildings and the grandstand structure must be greater than 10'-0".

After careful consideration to cost and budget for the options above, it was decided that relocation of the track may be cost effective given the escalating cost of steel and aluminum and keeping the construction as low to the ground would be beneficial to the project. The area was taken by the track was then made available to the design team to determine where seating could be considered for additional capacity.

The current preferred option extends the existing Diamond Head grandstand in the mauka and makai directions and replaces the existing 'Ewa Grandstand that had been relocated in phase

one with a new structure. This structure will then again be relocated to the practice field near the newly proposed track and soccer field in the former practice fields.

The seating at the existing Ching Stadium structure will be obscured by a new aluminum grandstand seating system that will terminate into a grand lanai at the top, which will cover the extent of the building from 'Ewa to Mauka. The lanai will end where the existing 2nd to 3rd level begins to rise, and monitors will be available to watch as they venture up into the former bleacher space. Areas under this new grandstand system can be used for vendor concessions.

5.4 UHM Alternative PV Implementation Schemes

In reflection of the UH's goal of building resiliency, three distinct PV scenarios were evaluated to provide UHM stakeholders a range of PV options from which a comparative review and evaluation process could be undertaken to define an optimal proposal (the UHM's Preferred Scenario -- discussed in further detail in Section 2.2.5.2). The three scenarios evaluated as part of this exercise are based on the following high-level criteria:

Scenario 1 "PV Everywhere"

Visible PV systems on every potential viable location that may consist of commercially viable PV systems, innovative or next-generation PV systems, innovative Building Integrated PV designs, or 'super structures' that may include rooftop installations spanning over multiple buildings and rooftop equipment, walkway canopies, glass walkway canopies, or large ground-mounts (See Figure 5-1).

Table 5-3 PV Scenario 1	
Number of Individual PV Systems	195
Total PV Capacity (MW)	57.4 MW
Total Annual Energy Production (kWh)	102,836,278 kWh
% Net-Zero Energy	86%

Scenario 2 "Commercially Viable"

Commercially proven, available, bankable, mix of PV systems consisting of conservative, or more traditional rooftop, ground mount, or canopy PV systems that may have limited to minimal impact of common area views, may require certain appropriate infrastructure upgrades (e.g., electrical, roofing, structural), and consist of newly available commercially viable PV products that may have been limited market deployment (See Figure 5-2).

Table 5-4 PV Scenario 2	
Number of Individual PV Systems	129
Total PV Capacity (MW)	22.1 MW
Total Annual Energy Production (kWh)	39,460,557 kWh
% Net-Zero Energy	33%

	# of Individual PV Systems	Total PV Capacity MW	Total Annual Energy Production kWh	Total Estimated Installation Cost $	% Net-Zero Energy %
Scenario 1	195	57.4 MW	102,836,278 kWh	$607,068,933	86%

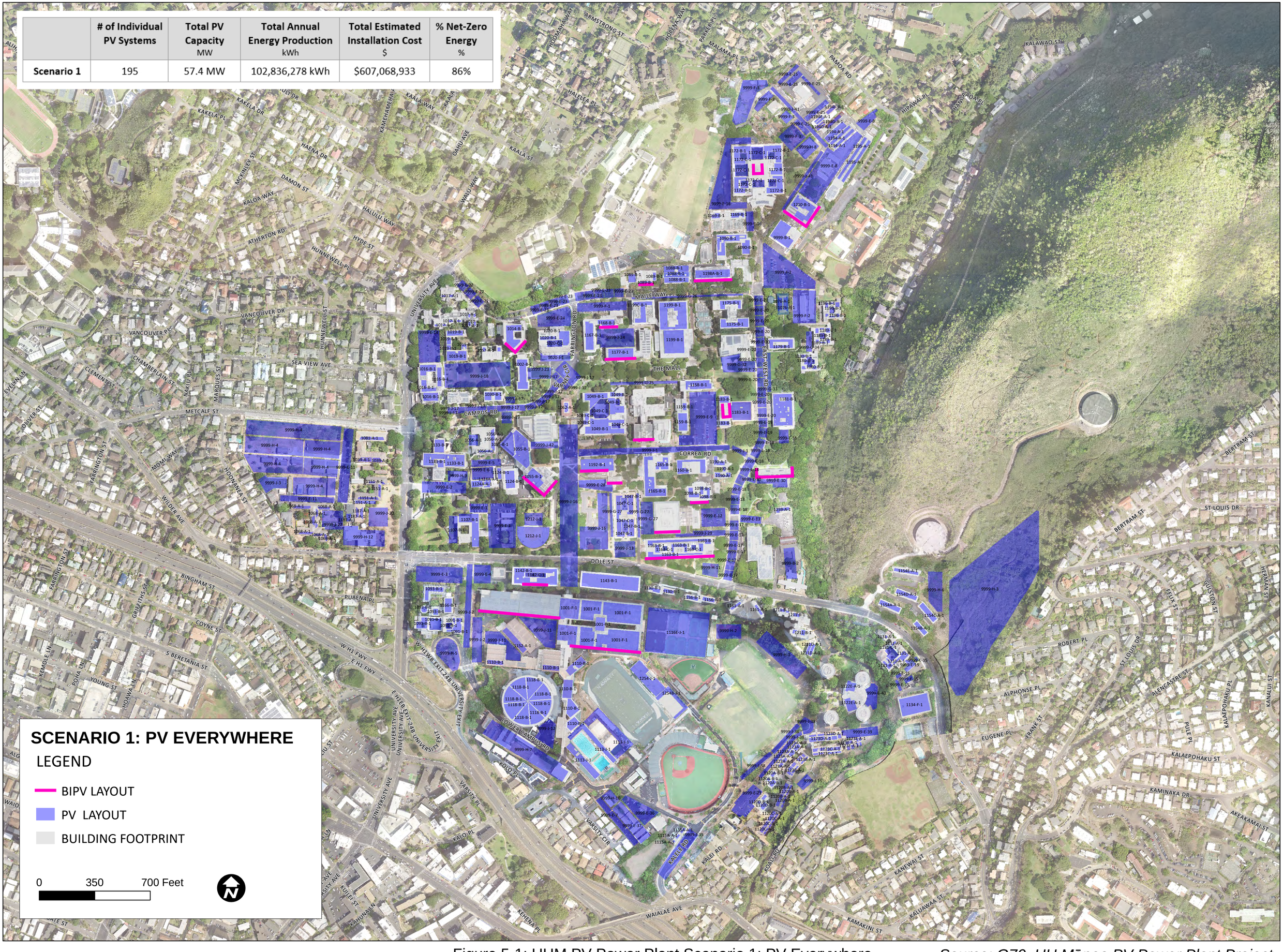

Figure 5-1: UHM PV Power Plant Scenario 1: PV Everywhere

Source: G70, UH Mānoa PV Power Plant Project

	# of Individual PV Systems	Total PV Capacity kW	Total Annual Energy Production kWh	Total Estimated Installation Cost $	% Net-Zero Energy %
Scenario 2	129	22.1 MW	39,546,911 kWh	$170,567,200	33%

SCENARIO 2: PV COMMERCIALLY VIABLE

LEGEND

- BIPV LAYOUT
- PV LAYOUT
- BUILDING FOOTPRINT

0 350 700 Feet

Figure 5-2: UHM PV Power Plant Scenario 2: Commercially Viable

Source: G70, UH Mānoa PV Power Plant Project

Scenario 3 "PV Conservative"

Conservative scenario consisting of commercially viable and typical roof-top from very aggressive and progressive PV systems in attempt to maximize PV production towards the 100% net zero emissions goal (Scenario 1), to an aggressive yet commercially available and proven set of PV systems (Scenario 2), to a relatively conservative set of PV systems that are estimated to be more easily and cost-effectively constructed (Scenario 3) (See Figure 5-3).

Table 5-5 PV Scenario 3	
Number of Individual PV Systems	83
Total PV Capacity (MW)	10.0 MW
Total Annual Energy Production (kWh)	17,969,198 kWh
% Net-Zero Energy	15%

Each individual conceptual PV system were evaluated against four main criteria:

1. System Size (kW)
2. System Cost ($/W)
3. Constructability
4. Aesthetic Impact

A scoring system was established to develop a quantifiable means to evaluate, compare, and rank-ordered each PV system. The rank-ordering of highest scoring to lowest scoring systems then served as one basis for the development of Scenario 1, Scenario 2, Scenario 3, and the Preferred Scenario, with review, feedback, and input provided from the UHM stakeholders.

In order for the UHM to achieve its resiliency goals in any PV Scenario, all energy generated from the PV systems installed must be utilized (if the % Net Zero Energy is equal or less than 100%). As such, at any given time when the PV systems' energy production may exceed the campus' energy use, such excess energy must be stored. In such cases, energy storage system(s) must be incorporated onto the UHM electrical system to store such excess energy for use by the UHM campus at a later time (e.g., during peak shaving application or overnight energy use).

The PV system installation will cover phases, likely spanning several years. As such, the energy storage build-out would be designed to match the PV phased installation, installing energy storage only at such phase where it is either required to match the PV phased installation, installing energy, or becomes cost-beneficial due to a peak-demand or utility rate arbitrage scenario.

There exist many types of energy storage technologies such as battery energy storage, compressed air energy storage, and flywheel energy storage, and pumped storage hydropower. The various storage technologies are each at different stages of maturity, or technical and manufacturing readiness, that may range from commercially viable and readily available, to proof-of-concept, to research and development.

For the purposes of the UHM PV Power Plant Project study, the battery energy storage system was selected for each PV Scenario as being the most cost-effective and commercially viable option and practical application at the time of this writing. However, this is not to say that future advances of other battery or storage technologies may not become more viable.

	# of Individual PV Systems	Total PV Capacity kW	Total Annual Energy Production kWh	Total Estimated Installation Cost $	% Net-Zero Energy %
Scenario 3	83	10.0 MW	18,055,552 kWh	$ 48,604,750	15%

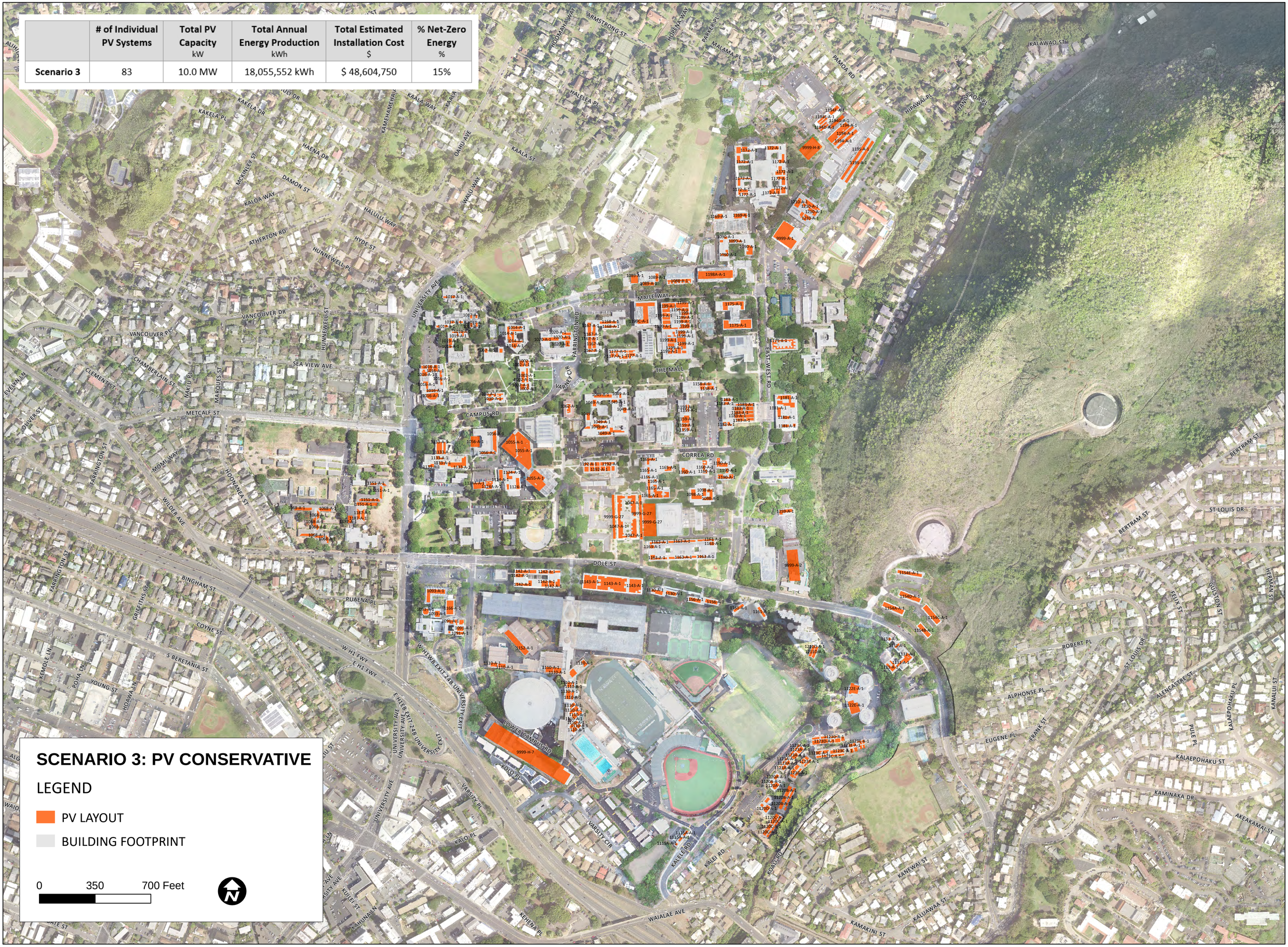

Figure 5-3: UHM PV Power Plant Scenario 3: PV Conservative

Source: G70, UH Mānoa PV Power Plant Project

As the implementation of the UHM's Net Zero Energy initiative may span many years, it is prudent to reevaluate technologies at future project implementation phases.

5.5 No Action Alternative

Inclusion of a "No Action Alternative" in an alternatives analysis assists decision-makers with the evaluation of the extent of a Proposed Action's potential impact by providing a baseline against which impacts can be measured and assessed.

Under the No Action Alternative, existing site conditions would remain and virtually nothing would change. In other words, none of the projects described in the LRDP would be implemented and the UHM campus would remain as it currently is.

The No Action alternative would avoid environmental impacts that may occur as a result of implementing the Proposed Action since existing conditions would remain the same. However, the No Action Alternative would also deprive the State, County, and UHM community of the beneficial economic, environmental, and social impacts associated with the Proposed Action. In summary, the purpose and need of the Proposed Action, as well as the objectives associated with it, would not be met by the No Action Alternative. Ultimately, the No Action Alternative fails to meet the objectives of the Proposed Action and consequently and is rejected as a feasible alternative to the meeting the purpose and need, as well as the stated goals and objectives of the Proposed Action.

Chapter 6:

Anticipated Determination of FONSI

CHAPTER 6: DETERMINATION OF FONSI

6. DETERMINATION OF FONSI

Potential impacts of the Proposed Action have been evaluated in accordance with the significance criteria of §11-200.1-13, HAR. Discussion of the Proposed Action's conformance to the criteria is presented as follows:

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

No natural or cultural resources of significance were identified within the project sites for the New Construction/Replacement of Existing Structures (Net Increase) Projects evaluated herein. Moreover, all projects being undertaken will occur in previous disturbed and developed areas. Hence, it is unlikely that any unknown cultural/historic properties and/or human skeletal remains would be encountered or disturbed by the various development and operation activities of the Proposed Action. In the event of unexpected discovery of historic or archaeological resources, the SHPD will be immediately notified for appropriate response and action. It is acknowledged that the UHM's landscape is one of its most valuable and distinctive attributes, the UHM's goal is to celebrate its unique natural assets. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources. Thus, it is anticipated that if any significant plants or landscapes need to be removed or altered to implement the Proposed Action, the plants or landscapes would be returned to existing conditions to the extent feasible or enhanced.

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

The Proposed Action will not curtail the range of beneficial uses of the environment. As noted above, the UHM's landscape is one of its most valuable and distinctive attributes, the UHM's goal is to celebrate its unique natural assets and reduce impervious surfaces. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources.

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

The Proposed Action will not conflict with the long-term environmental policies, goals, and guidelines of the State of Hawai'i as noted throughout Chapter 4 of the EA. In fact, the UHM seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. This will in turn benefit many of the State's environmental goals as it relates to GHG emissions and climate change. Moreover, short-term impacts associated with

various construction activities will be mitigated through best management practices noted throughout Chapter 3 of the EA.

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

The Proposed Action will not have a significant adverse effect on the economic welfare, social welfare, or cultural practices of the State as discussed in Chapters 3 and 4 of the EA.

The Proposed Action will create construction jobs to implement the various projects under the Proposed Action. Moreover, the UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retains current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers. In turn, the UHM students will enter the State's workforce and contribute to the overall economy for future generations.

The Proposed Action will not have an effect on cultural resources or practices at the UHM campus. As noted in Section 3.8, the Proposed Action is an opportunity to enhance these practices. One of the UHM's goals is to create a living campus that supports community and student well-being. This will include services for students, staff, and faculty as well as members of the local community, and a long-term emphasis on encouraging development of student and faculty housing on and near campus. Leveraging the UHM campus as a program opportunity would allow the UH to invest in the quality of campus life and citizenship which also means investing in a range of recreation opportunities including everything from the lo'i space, athletic fields, to hiking trails and outdoor eating spaces. Creating key areas and zones that serve the wider public as well as the immediate campus community will serve to heighten regional appreciation and awareness of UHM's research pursuits and increase the UH's civic value for decades to come. Moreover, The UH also intends to create vibrant gathering spaces that can be the foundation of the UHM campus development. This includes supporting gathering spaces at all scales – formal and informal, and indoor and outdoor.

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

No identifiable adverse short- or long-term impacts on public-health are anticipated to result from the construction and operation of the Proposed Action. Typical short-term construction-related impacts (e.g., noise and air quality) are anticipated, however, they will be temporary in nature and will comply with State and County regulations as discussed in Chapter 3 of the EA.

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

Substantial impacts to public facilities are not anticipated to result from the construction and operation of the Proposed Action. Nor is the Proposed Action anticipated to induce substantial population changes. The UHM is the largest and oldest of the ten campuses within the overall UH system. The UHM offers hundreds of undergraduate, graduate, doctoral, and professional degree programs. The UHM is classified as one of 115 Carnegie R1 Universities and is also one of a handful of Land-,Sea-, Space-, and Sun-Grant institutions. The UHM also provides 21

National Collegiate Athletic Association (NCAA) Division I athletic programs with approximately 450 student athletes competing on men's, women's, and co-ed varsity teams. The UHM has been widely recognized as a world-class university providing affordable, quality higher education to the people of Hawai'i and for conducting pioneering research to address critical issues facing the State. The Proposed Action intends to continue to promote the UHM as a world-class institution with instruction and scholarship that is successfully embodied in its consistent status as a top-ranked research institution. To remain a top-ranked research institution, the UHM intends to retain current faculty and attract new faculty and researchers by adding more research space and ensuring distribution is similar to prominent peers. Moreover, the Proposed Action will also provide much needed facilities to support the various programs offered at the UHM which will provide students the opportunity to be successful academically and professionally to pursue their socio-economic aspirations.

Existing water, wastewater, drainage, and utility infrastructure have served the UHM Campus for many years and are expected to continue to serve the UHM campus. It is anticipated that existing wastewater systems will be improved to serve the Proposed Action as detailed by the Sewer Master Plan. Agencies with jurisdiction over their respective infrastructure systems will continue to be consulted as the Proposed Action progresses to ensure that infrastructure needs can be accommodated.

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

The Proposed Action is not anticipated to substantially degrade environmental quality. Long-term impacts to air and water quality, noise levels and natural resources will be minimal. Typical short-term construction-related impacts (e.g., noise and air quality) are anticipated, but will be temporary and will comply with State and County regulations. The UHM seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. This will in turn assist the island's goal of attaining energy self-sufficiency benefiting the State's overall environmental quality.

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

The Proposed Action does not have a considerable effect upon the environment as discussed in Chapter 3 of the EA. There are no commitments for further action beyond the scope presented within this EA.

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

No significant impacts on flora and faunal resources are anticipated to result from the construction and operation of the Proposed Action as discussed in Section 3.6.1 of the EA. The UHM campus is situated within a high altered urban environment in the primary urban corridor of Honolulu. There is the potential that several native and special status species may overfly or occur at the UHM campus during nesting seasons, however, impacts can be mitigated by implementing various measures presented in Section 3.6.1. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the

campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources. Thus, it is anticipated that any significant plants or landscapes that may need to be removed or altered to implement the Proposed Action would be returned to existing conditions to the extent feasible or enhanced. Additionally, soil disturbing construction related activities may unearth soil and plant material that potentially contains invasive fungal pathogens vertebrate and invertebrate pests (e.g. Little Fire Ants, Coconut Rhinoceros beetles), or invasive plant parts that could harm Hawai'i's native species and ecosystems. In general, to reduce potential impacts, the mitigation measures presented in Section 3.6.1 are recommended.

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

No long-term significant impacts to air quality, water quality, or noise levels at the UHM campus are anticipated as a result of the construction and operation of the Proposed Action.

In the short- and long-term, no significant impacts on air quality are anticipated to result from the construction of the Proposed Action. Construction for the New Construction/Replacement of Existing Structures (Net Increase) Projects will involve fine grading as well as limited excavation for utility lines and fencing. Fugitive dust will be controlled, as required, by methods such as dust fences, water spraying and sprinkling of loose or exposed soil or ground surface areas. Planting of landscaping and stabilization measures will be done as soon as possible on completed areas to help control erosion and runoff that could potentially enter the stream in the long-term. Respective contractors will be responsible to minimize air quality impacts during the various phases of construction. Exhaust emissions from construction vehicles are anticipated to have negligible impact on air quality in the project vicinity as the emissions would be relatively small and readily dissipated. In the long-term, some vehicular emissions related to operations at the project site are expected, however, due to the generally prevailing tradewinds, the emissions would be readily dissipated. The UHM seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. This will in turn benefit the overall air quality in the State as the UHM campus would be emitting less GHG emissions.

No short- or long-term significant impacts on surface and/or coastal waters in the vicinity are anticipated during construction or operation of the Proposed Action. Majority of the projects under the Proposed Action are not in proximity to the stream. However, the Mixed-Use Housing P3 Project is adjacent to Mānoa Stream. It should be noted that this project has undergone its own environmental review process, which was determined to have no significant impacts, including impacts to surface waters. The Mixed-Use Housing P3 Project will adhere to stringent best management practices during construction and operation to preserve surface water resources. Best management practices include, but are not limited to, 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. Planting of landscaping and stabilization measures will be done as soon as possible on completed areas to help control erosion and runoff that could potentially enter the stream in the long-term. There will not any encroachments on any waters of the United States (U.S.), and therefore additional permitting with the Army Corps of Engineers is not required for the Mixed-

Use Housing P3 Project. Any discharges related to the construction or operation of the Proposed Action would comply with applicable State Water Quality Standards as specified in Sections 11-54 and 11-55, HAR. Moreover, an NPDES permit for stormwater runoff from construction activities would be required as individual and/or cumulative soil disturbances in a project area should it exceed one acre of land area. The developer for the Mixed-Use Housing P3 Project also intends to coordinate closely with the Kamakakūokalani Center for Hawaiian Studies and monitor water quality to mitigate any potential impacts that would disrupt the operations of the Ka Papa Loʻi ʻo Kānewai. The UHM campus is approximately 1.3 miles away from the nearest coastal body water. Mānoa Stream does, however, discharge into the Ala Wai Canal which flows into Māmala Bay.

The existing background ambient noise levels within the Lower Campus are controlled by traffic along the H-1 Freeway and its On- and Off-Ramps between Kalele Road to the east and University Avenue to the west, Waialae Avenue, University Avenue, and Dole Street. As discussed in Section 3.10, calculations of average exterior and interior noise levels from construction activities were performed for typical naturally ventilated and air-conditioned dwellings. Predicted noise levels were compared with existing background ambient noise levels, and the potential for noise impacts was assessed. In the short-term, audible construction noise will be unavoidable for the various projects under the Proposed Action. The total time period for construction is unknown, but it is anticipated that the actual work will be moving from one location on the UHM campus to another during that period. Actual length of exposure to construction noise at any receptor location will probably be less than the total construction period for the Proposed Action. The existing residences along the south boundary in the vicinity of Lower Campus may experience the highest noise levels during the construction activities due to their close proximity to the UHM Campus and New Construction/Replacement of Existing Structures (Net Increase) Projects. Noise from the construction is not expected to adversely affect public health and welfare due to the temporary nature of the work, relatively high background noise levels at the closest residence which front major roadways, and due to the administrative controls available for regulation of construction noise. Instead, these impacts will be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the UHM campus. Mitigation of the construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise course (70 dB at 300-foot distance), and due to the exterior nature of the work. The use of properly muffled construction equipment should be required on the job site. With regards to classrooms in proximity to construction activities, it is recommended that the use of sound attenuating barriers between the construction site and classroom buildings be used during classroom hours, as appropriate. Also, temporary air conditioning can also be used to reduce construction noise impacts on classes.

Construction noise impacts can be mitigated by compliance with provisions of the State DOH Administrative Rules, Title 11, Chapter 46, "Community Noise Control" regulations. These rules require a noise permit if the noise levels from construction activities are expected to exceed the allowable levels stated in the DOH Administrative Rules.

(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, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;

No short- or long-term significant impacts are anticipated as the UHM campus is not located within an environmentally sensitive area as noted in Section 3.5 of the EA.

All projects under the LRDP are within Zone X, and outside Zone AE. Hence, no construction activities or operations would occur within Zone AE. In the short-term, applicable best management practices would be implemented including, but not limited to, 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 so that impacts of flooding are not exacerbated from construction. In the long-term, it is anticipated that the New Construction/Replacement of Existing Structures (Net Increase) Projects, including Mixed-Use Housing P3 Project (nearest to Mānoa Stream), will incorporate applicable drainage improvements and appropriate building codes related to flooding impacts. It should also be noted that the projects under the LRDP will not result in an increase of impervious surfaces. All projects being undertaken will occur in already developed areas on the UHM campus. In fact, the demolition projects will result in more open space around the UHM campus, creating more pervious surfaces which can have beneficial impacts with regards to flooding.

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

The Proposed Action will not result in significant impacts to view planes identified in County or State plans or studies. Moreover, the Proposed Action is not expected to adversely affect scenic and visual resources at the UHM campus. The Proposed Action will not degrade lateral coastal views or mauka-makai views from areas in the vicinity of the UHM campus. The vertical components of the Proposed Action will be consistent with the visual character of the surrounding uses.

With regards to the existing significant landscapes, these are not anticipated to be impacted by the Proposed Action. Where the New Construction/Replacement of Existing Structures (Net Increase) Projects are sited to occur, there are no significant landscapes in the immediate vicinity. In fact, as a part of this Proposed Action, a Landscape Master Plan is being developed for the subsequent PRU Permit. The UHM's landscape is one of its most valuable and distinctive attributes, the UHM's goal is to celebrate its unique natural assets. The UHM intends to enhance and increase landscape spaces to create a robust sense of connection to place. This includes cultivating the campus as a Hawaiian place of learning; strengthening the campus arrival experience; incorporating natural elements into the everyday experience; increasing diverse open space types and multi-functional landscapes, emphasizing tree canopy and native species; and connecting the campus to adjacent open space trails and resources. Thus, it is anticipated that any significant plants or landscapes that may need to be removed or altered to implement the Proposed Action would be returned to existing conditions to the extent feasible or enhanced.

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

In the long-term, it is anticipated that the Proposed Action will provide beneficial impacts to the climate with regards to emissions generated by the UHM campus. As noted in Section 2.1, the UHM seeks to achieve carbon neutrality by 2050, build flexibility, and resilience through climatological foresight, multi-functional landscapes and operational preparedness. This includes allowing for a more flexible approach to development and capital improvement plans; creating a more agile campus that can anticipate and adapt to change; and investing in redundant systems to ensure continuity of operations. The first step for the UHM to achieve its resiliency goals, the Proposed Action incorporates the UHM PV Power Plant Project which explores the feasibility of installation of PV components on all potential surfaces on campus (including on building rooftops

and elevations, walkways, courtyards, parking lots, roadways, and unrestricted landscape areas), and considers the use of PV components in all available forms (including standard panels or via Building Integrated PV units such as roof tiles, atriums, canopies, window glazing & siding, etc.) as discussed in Section 2.2.5.2 of this EA. As noted by Table 2-1, the UHM PV Power Plant Project Preferred Scenario would achieve 56% of the Net-Zero Energy goal for the campus.

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Chapter 7:

Consultation

CHAPTER 7: CONSULTATION

7. CONSULTATION

7.1 Early Consultation/Pre-Assessment Package

The Early Consultation/Pre-Assessment process included efforts to inform the community and solicit input in scoping the EA for the Proposed Action. It should be noted that on February 25, 2021, an Early Consultation/Pre-Assessment Package for the Clarence T.C. Ching Athletic Complex Phase 1 Expansion was mailed out to State and City and County of Honolulu agencies, as well as various community stakeholders. Shortly thereafter, the University of Hawai'i determined that the Clarence T.C. Ching Athletic Complex Phase 1 Expansion would not require the preparation of Chapter 343, HRS environmental documentation as previous disclosure documents adequately assessed the general nature of the proposed improvements. However, the comments received from the February 2021 Early Consultation/Pre-Assessment Package for the Clarence T.C. Ching Athletic Complex Phase 1 Expansion were reviewed and are incorporated within this EA documentation to the extent feasible as it relates to the Clarence T.C. Ching Athletic Complex Phase 2 Expansion.

The Early Consultation/Pre-Assessment Package for the Proposed Action was mailed out on January 3, 2022, to the following agencies, organizations, and stakeholders listed below. It should be noted that the mailing list for the Proposed Action was based on prior engagement efforts regarding the Proposed Action. Hence, those that received the Clarence T.C. Ching Athletic Complex Phase 1 Expansion Early Consultation/Pre-Assessment Package in February 2021, also received the Early Consultation/Pre-Assessment Package for the Proposed Action. Those that provided comments on the Early Consultation/Pre-Assessment Package are represented with a checkmark (✓). An Asterix (*) identifies those that provided comments on the Clarence T.C. Ching Athletic Complex Phase 1 Expansion Early Consultation/Pre-Assessment Package. Copies of all comments received, including the comments on the Clarence T.C. Ching Athletic Complex Phase 1 Expansion Early Consultation/Pre-Assessment Package, along with the appropriate response letters, are reproduced herein as Appendix J.

Federal Agencies

U.S. Army Corps of Engineers
U.S. Department of the Interior, Fish and Wildlife Service*
U.S. Environmental Protection Agency
U.S. Federal Aviation Administration

State Agencies

Department of Accounting and General Services*
Department of Agriculture
Department of Business, Economic Development, and Tourism (DBEDT)
DBEDT, Strategic Industries Division
DBEDT, Hawai'i State Energy Office
DBEDT, Land Use Commission
DBEDT, Office of Planning and Sustainable Development (OPSD)
DBEDT, OPSD-Environmental Review Program
✓ Department of Defense (DOD)
DOD, Hawaii Army National Guard
✓ Department of Education*
Department of Health (DOH)

DOH, Environmental Management Division
DOH, Hazard Evaluation and Emergency Response Office
DOH, Wastewater Branch
✓ DOH, Safe Drinking Water Branch
Department of Land and Natural Resources (DLNR)
✓ DLNR, Office of Coastal and Conservation Lands
DLNR, State Historic Preservation Division
Department of Hawaiian Home Lands*
✓ Department of Transportation (DOT)*
DOT, Airports Division
✓ Hawai‘i Community Development Authority
Office of Hawaiian Affairs

City and County of Honolulu Agencies

✓ Fire Department*
✓ Police Department
Department of Environmental Services
✓ Department of Planning and Permitting
✓ Department of Parks and Recreation
✓ Department of Design and Construction
✓ Board of Water Supply*
✓ Department of Transportation Services*
✓ Department of Facility Maintenance*
Office of the Mayor

Elected Officials

Senator Brian Taniguchi
Senator Les Ihara
Senator Sharon Moriwaki
Senator Brian Schatz
Representative Dale Kobayashi
Representative Della Au Belatti
Representative Scott Saiki
Representative Scott Nishimoto
Representative Bert Kobayashi
Representative Jackson Sayama
Councilmember Carol Fukunaga
Councilmember Ed Case
Councilmember Calvin Say
Councilmember Tommy Waters

Utility Companies

✓ Hawai‘i Gas*
Hawaiian Electric Company
Hawaiian Telcom
Spectrum Hawai‘i*

Library / Depositories

Hawai‘i State Library
Hamilton Library
Mānoa Public Library

Other Interested Parties and Stakeholders

Kaimuki - Neighborhood Board No. 4
Diamond Head/ Kapahulu/ St. Louis Heights – Neighborhood Board No. 5
Mānoa – Neighborhood Board No. 7
McCully/Mōʻiliʻili – Neighborhood Board No. 8
Waikiki – Neighborhood Board No. 9
Maikiki – Neighborhood Board No. 10
St. Louis Heights Community Association
Mānoa Outdoor Circle*
✓ Mālama Mānoa*
Mōʻiliʻili Hongwanji Buddhist Temple – Mōʻiliʻili Hongwanji Mission
Japanese Cultural Center of Hawai‘i
Mōʻiliʻili Community Center
Kamehameha Schools
Punahou School*
Ron Lockwood*
✓ Laura Ruby
Jeremy Lim

7.2 Draft Environmental Assessment

Seventeen (17) comment letters were received during the public and agency comment period for the subject EA, which began with the publication of the Draft EA in the State Environmental Review Program's *Environmental Notice* June 8, 2022, publication which ended 30 days later on July 8, 2022. The comment letters and respective response letters are reproduced herein as Appendix K.

The following agencies and stakeholders commented on the Draft EA:

State Agencies

Department of Accounting and General Services
Department of Education
DOH, Solid and Hazardous Waste Branch
DOH, Wastewater Branch
Department of Land and Natural Resources (DLNR)
DLNR, Division of Aquatic Resources
DLNR, Engineering Division
DLNR, Division of Forestry and Wildlife
DOT

City and County of Honolulu Agencies

Fire Department
Police Department
Department of Environmental Services
Department of Planning and Permitting

Department of Design and Construction
Board of Water Supply
Department of Transportation Services
Department of Facility Maintenance

Other Interested Parties and Individuals

Spectrum Hawai'i
Mālama Mānoa
Ms. Laura Ruby

Chapter 8:

References

CHAPTER 8: REFERENCES

8. REFERENCES

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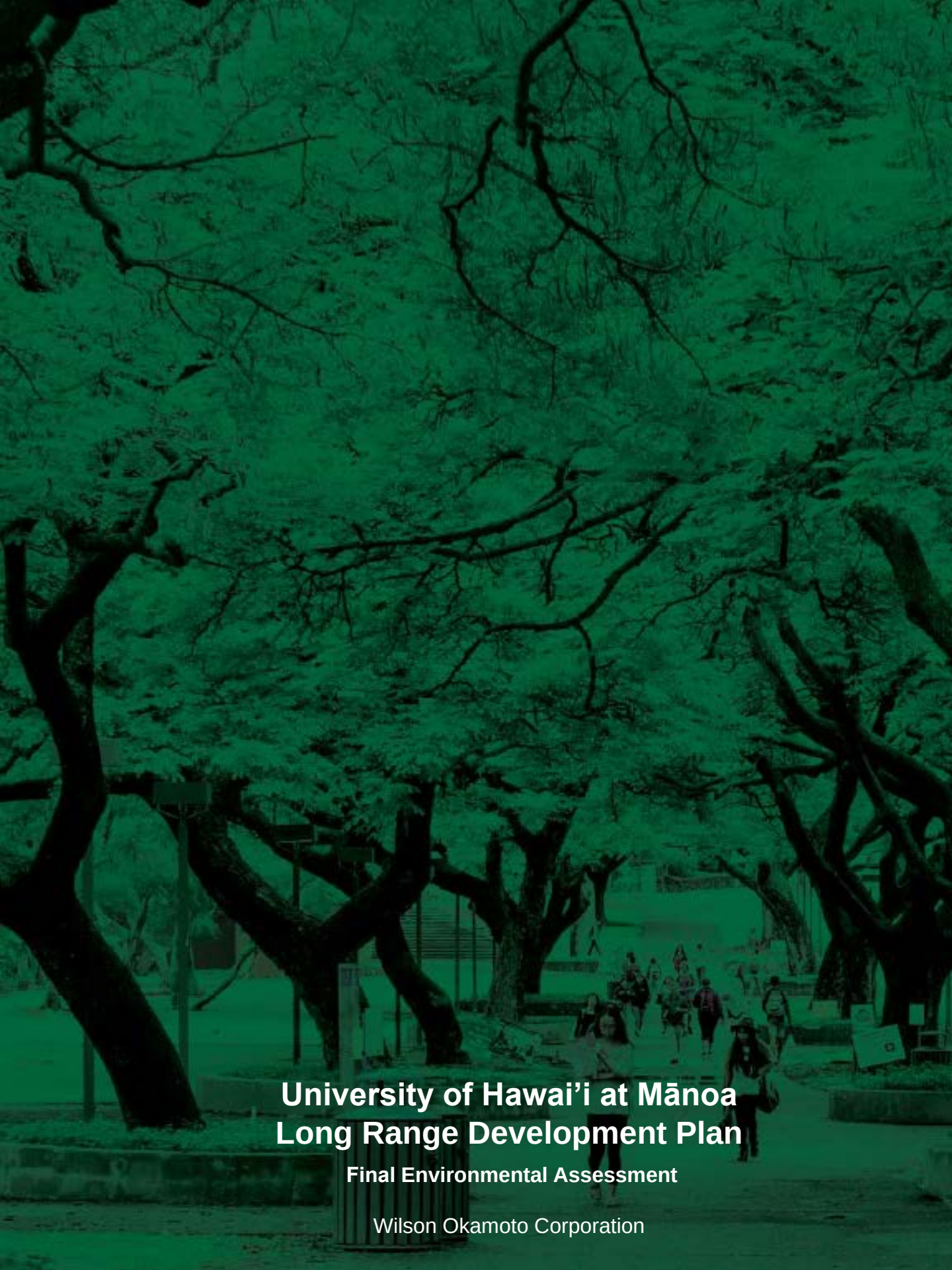

University of Hawai'i at Mānoa
Long Range Development Plan

Final Environmental Assessment

Wilson Okamoto Corporation