

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

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JUL 23 2021

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DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

July 16, 2021

2021/ED-9(CK)

Mr. Keith Kawaoka, Acting Director
State of Hawaii
Department of Health
Office of Environmental Quality Control
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

Dear Mr. Kawaoka:

SUBJECT: Chapter 25, Revised Ordinances of Honolulu
Draft Environmental Assessment (DEA)
Project: 4439 Kahala Avenue Single-Family Residence
Project
Applicant: 4439 Kahala, LLC
Agent: G70 (Jeff Overton)
Location: 4439 Kahala Avenue - Kahala
Tax Map Key (TMK): 3-5-003: 007

With this letter, the Department of Planning and Permitting hereby transmits the DEA and Anticipated Finding of No Significant Impact for the 4439 Kahala Avenue Single-Family Residence Project, located at 4439 Kahala Avenue in Kahala (TMK 3-5-003: 007), Oahu, for publication in the July 23, 2021, edition of *The Environmental Notice*.

We have uploaded an electronic copy of this letter, the publication form, and the DEA to your online submittal site.

Should you have any questions, please contact Christi Keller, of our Zoning Regulations and Permits Branch, at 768-8087, or by email at c.keller@honolulu.gov.

Very truly yours,

A handwritten signature in black ink, appearing to read "Dean Uchida".

For: Dean Uchida
Director

22-005

**NON-CHAPTER 343 DOCUMENT
PUBLICATION FORM
OFFICE OF ENVIRONMENTAL QUALITY CONTROL**

Project Name: 4439 Kahala Avenue Single Family Residence Project

Applicable Law: Chapter 25, Revised Ordinance of Honolulu, Special Management Area

Type of Document: Environmental Assessment (EA) and Anticipated Finding of No Significant Impact (AFONSI)

Island: Oahu

District: Council District 4; Primary Urban Center Development Plan Area

TMK: (1) 3-5-003:007

Permits Required: Special Management Area (SMA) Use Permit; Building Permits; Grading, Grubbing, and Stockpiling Permits; Sewer Connection Permit; BWS Plan Approval; HECO Plan Approval; Street Usage

Applicant or Proposing Agency: 4439 Kahala LLC
Contact: Janice J. Lau
janjlau@gmail.com
(808) 545-1700
125 Merchant Street, Suite 200
Honolulu, HI 96813

Approving Agency or Accepting Authority: City and County of Honolulu
Department of Planning and Permitting
Christi Keller
c.keller@honolulu.gov
(808) 768-8087
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Consultant: G70
Contact: Jeffrey Overton, Principal
jeff@g70.design
(808) 523-5866
111 S. King Street, Suite 170
Honolulu, HI 96813

Status: Draft EA - Public Review and Comment

Project Summary: The Project consists of the redevelopment of a 35,428-square-foot lot with a new 4,500-square-foot single-story, single family dwelling unit, and a new 980-square-foot guest cottage on a shoreline lot located in the Kahala community within the SMA (Project). The proposed primary dwelling unit will consist of four bedrooms, a lanai and a separate three-car garage under a pitched roof. The site is currently vacant, with areas of remnant concrete slab foundations from the prior residential use, and scattered areas of non-native plants, shrubs, and weedy vegetation. The primary residence will be the closest structure to the presumed shoreline (existing nonconforming seawall), and set back approximately 61 feet from the seawall.

Reasons Supporting Determination: Potential short-term construction-related impacts relating to water quality, biological and marine resources, soils and cultural resources are anticipated to be reduced to a level of less than significant through compliance with existing regulatory standards, implementation of Best Management Practices, and implementation of mitigation measures as identified in the Draft EA. As it is located on a shoreline lot, the Project proposes compliance with mandatory regulations (flood plain, building code, stormwater) as well as site design and structural considerations to address potential long-term impacts related coastal hazards. The Project is not anticipated to result in any additional need for public services, resources, or infrastructure over the existing condition.

4439 Kāhala

DRAFT ENVIRONMENTAL ASSESSMENT

WAIKĪKĪ , KONA, O'AHU, HAWAI'I



APPLICANT:

4439 KAHALA LLC

PREPARED BY:



JULY 2021

4439 Kāhala

DRAFT ENVIRONMENTAL ASSESSMENT

WAIKĪKĪ , KONA, O'AHU, HAWAI'I

TMK (1) 3-5-003:007

APPLICANT:

4439 KAHALA LLC
125 MERCHANT STREET, SUITE 200
HONOLULU, HI 96813

APPROVING AGENCY:

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PLANNING AND PERMITTING
650 SOUTH KING STREET, 7TH FLOOR
HONOLULU, HI 96816

PREPARED BY:



111 S. KING STREET, SUITE 170
HONOLULU, HI 96813

JULY 2021

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- B. Preliminary Site Plans for 4439 Kāhala Avenue
- C. Archaeological Assessment for 4439 Kāhala Avenue in Waikīkī Ahupua'a, Kona District, Island of O'ahu, Keala Pono Archaeological Consulting, LLC., April 2021.

Abbreviations

BMP	Best Management Practice
BWS	Board of Water Supply
CAB	Clean Air Branch
City	City and County of Honolulu
CMU	Concrete Masonry Unit
CO	Carbon Monoxide
CZM	Coastal Zone Management
dBA	Decibel
DLNR	Department of Land and Natural Resources
DOH	Department of Health
DPP	Department of Planning and Permitting
EA	Environmental Assessment
ENV	Department of Environmental Services
EPA	Environmental Protection Agency
FFE	Finished Floor Elevation
FONSI	Finding of No Significant Impact
ft	Feet
GHG	Greenhouse Gases
GPD	Gallons Per Day
GPM	Gallons Per Minute
HAR	Hawai'i Administrative Rules
HECO	Hawaiian Electric Company
HFD	Honolulu Fire Department
HPD	Honolulu Police Department

HRS	Hawai'i Revised Statutes
IBC	International Building Code
LID	Low Impact Development
LUO	Land Use Ordinance
MPH	Miles Per Hour
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NOAA	National Oceanic and Atmospheric Administration
POR.	Portion
ppm	Parts Per Million
PUC DP	Primary Urban Center Development Plan
ROH	Revised Ordinances of Honolulu
RSWMP	Residential Storm Water Management Plan
SAAQS	State Ambient Air Quality Standards
SCP	Sustainable Communities Plan
sf	Square Feet
SHPD	State Historic Preservation Division
SLR	Sea Level Rise
SLR-XA	Sea Level Rise Exposure Area
SMA	Special Management Area
TMK	Tax Map Key
TRB	Traffic Review Branch
UH	University of Hawai'i
USGS	United States Geological Survey

Chapter 1

Introduction

Chapter 1

Introduction

This Environmental Assessment (EA) has been prepared pursuant to and in compliance with Chapter 25, Special Management Area (SMA), Revised Ordinances of Honolulu (ROH), in support of an SMA Use Permit application. EA content and procedures are consistent with the requirements of Chapter 343, Hawai'i Revised Statutes (HRS) and Hawai'i Administrative Rules (HAR), Title 11, Chapter 200.1, Department of Health (DOH).

1.1 Project Information Summary

Type of Document:	EA
Project Name:	4439 Kāhala
Recorded Fee Owner / Applicant:	4439 Kahala LLC 125 Merchant Street, Suite 200 Honolulu, HI 96813 Contact: Janice J. Lau
Agent:	G70 111 S. King Street, Suite 170 Honolulu, HI 96813 Contact: Jeff Overton, Principal
Approving Agency:	City and County of Honolulu (City) Department of Planning and Permitting (DPP) 650 S. King Street, 7 th Floor Honolulu, HI 96813 Contact: Christi Keller
Ch. 343, HRS Triggers:	A requirement of SMA Use Permit per ROH §25
Project Location:	4439 Kāhala Avenue, Honolulu, HI 96816 (<i>Figure 1.1</i>)
Tax Map Key (TMK):	(1) 3-5-003:007 (por.) (<i>Figure 1.2</i>)
Project Area:	Project Area: 0.14 acres Parcel Area: 0.813 acres
State Land Use District:	Urban (<i>Figure 1.3</i>)
City & County of Honolulu Zoning:	R-7.5 Residential (<i>Figure 1.4</i>)

- City Development Plan:** Primary Urban Center Development Plan (*Figure 5.1*)
- Special Management Area:** Located within SMA (*Figure 1.5*)
- Flood Zone:** Zone X (Areas determined to be outside the 0.2% annual chance floodplain) and Zone VE (Coastal Flood Zone with Velocity Hazard (wave action); base flood elevation determined) (*Figure 1.6*)
- Anticipated Determination:** Finding of No Significant Impact (FONSI)

1.2 Site Location and Characteristics

The subject property is located in Honolulu in the traditional moku of Kona, east of Lē‘ahi (Diamond Head) in the Kāhala area, and near the intersection of ‘Elepaio Street and Kāhala Avenue. The site is designated as TMK 3-5-003:007 located at 4439 Kāhala Avenue. The parcel is owned by 4439 Kahala LLC. The site is bordered by the Pacific Ocean to the south, Kāhala Avenue to the north, low-density residential properties to the east, and a vacant property to the west (*Figure 1.1*). The existing site is vacant, with areas of remnant concrete slab foundations from the prior residential use, and scattered areas of nonnative plants, shrubs, and weedy vegetation. The property is located within the SMA.

1.3 Overview of the Planned Residential Use

The owner is seeking to redevelop the subject property with a one-story, single family residence for a local kama‘aina family. This four-bedroom home with pitched roof includes a covered lanai and three-car garage. The new home will have a floor area of approximately 4,500 square feet (sf), with a separate guest cottage of approximately 980 sf. Supporting utilities will be installed for water, sewer, electric and communications. Landscaping elements will include front and back lawns and gardens. Access will be provided by an existing driveway from Kāhala Avenue.

1.4 Purpose of the Environmental Assessment

This EA is being prepared pursuant to the requirements of ROH §25, in support of an SMA Use Permit application. The EA is prepared in accordance with content and procedures under HRS §343. The City has determined that pursuant to Act 16 (2020), an SMA Use Permit must be secured for the construction or reconstruction of a single-family residence that is on a shoreline lot as defined in ROH §23-1.3, regardless of floor area. The prior threshold for requiring an SMA Permit was for homes exceeding 7,500 sf on shoreline parcels.

The City DPP is the approving agency. The EA examines the potential environmental impacts of the planned improvements and seeks agency and public comment on subject areas that should be addressed. It is anticipated that due to the limited impacts generated by this residence, the Final Environmental Assessment will result in a Finding of No Significant Impact (FONSI).

1.5 Permits and Approvals Required

Other approvals are required from the County and State to implement the proposed action, some of which include:

- SMA Use Permit Major (DPP, Honolulu City Council)
- Building Permits (Buildings, Electrical, Plumbing), and Sidewalk/Driveway Work (DPP)
- Grading, Grubbing, and Stockpiling Permits (DPP)
- Sewer Connection Permit (DPP)
- Plan Approval (Board of Water Supply)
- Plan Approval (Hawaiian Electric Company)
- Street Usage (Department of Transportation Services)

1.6 Agencies, Organizations and Individuals Contacted in Early Consultation and Draft EA Process

Agencies, legislators, and members of the community were consulted in the preparation of this EA. Early consultation letters were mailed to select individuals to review the scope of the residential project. Parties contacted in early consultation are listed below. Further information is detailed in *Chapter 7*.

State

- Representative Bertrand Kobayashi – State House District 19
- Senator Stanley Chang – State Senate District 9

City and County

- Department of Planning and Permitting
- City Council Chair and Councilmember Tommy Waters - Honolulu City Council District 4

Organizations and Individuals

- Chairman Richard Turbin - Waiialae-Kahala Neighborhood Board #3
- Daikichi Saito, Representative of adjacent neighbor



Figure 1.1

Project Location



Figure 1.2

Tax Map Key



Figure 1.3

State Land Use Classification



Figure 1.4

City and County of Honolulu Zoning



Figure 1.5

Special Management Area



Figure 1.6

Flood and Tsunami Evacuation Zones

Project Description

Chapter 2

Project Description

This chapter provides the existing uses of the property and surrounding areas. An overview of the planned improvements is provided.

2.1 Existing Conditions and Site Preparation

The property is located on TMK 3-5-003:007 and is bordered by the Pacific Ocean to the south, Kāhala Avenue to the north, low-density residential properties to the east, and a vacant property to the west (*Figure 1.1*). The 0.813-acre parcel is owned in fee by 4439 Kahala LLC, and is currently vacant, with scattered areas of nonnative plants, shrubs, and weedy vegetation.

The subject property has been utilized for residential use for nearly a century since the establishment of shoreline lots in Kāhala. The most recent use of this property included a large single-family home, a swimming pool, tennis court, and underground utility connections. The pre-existing structures were demolished several years ago, and several concrete foundation slabs remain (*Figure 2.1*). To prepare the site for construction, the foundation remnants will be removed and minor grading and leveling is required. Side yard walls constructed of concrete masonry units (CMU) remain standing on the east and west sides of the property.

A 1983 certified shoreline survey (Sam O. Hirota Inc.) identifies a seawall feature on their survey drawing (*Appendix A*). The existing concrete rubble masonry seawall was constructed along the property shoreline prior to 1946 and is classified as a nonconforming structure. The City and County Department of Planning and Permitting (DPP) 1988 inventory of shoreline structures on O'ahu identifies this property as having a seawall which was constructed prior to the 1976 Shoreline Setback Ordinance.

2.2 Description of the Proposed Action

The owner will improve the property with a one-story, single family residence. This four-bedroom, five-bath home with pitched roof includes a large, covered lanai with outdoor kitchen overlooking the expansive lawn and ocean view (*Appendix B*). A three-car garage will be located near the front of the property adjacent to Kāhala Avenue. Landscaping elements will include large front and back lawns and privacy gardens. Clearing, grading, and leveling is required to prepare the site for construction. Access will be provided by one existing driveway.

The total floor area of improvements will be approximately 6,180 square feet (sf). The main residence is approximately 4,500 sf (not inclusive of lanais), 700 sf garage, and an approximately 980 sf separate guest cottage. Refer to the Conceptual Site Plan in *Figure 2.2*. The Site Plan is subject to further refinements during final design. Perspective views of the new home are shown in *Figures 2.3 and 2.4*.

All of these structures will be located greater than 55 feet (ft) from the shoreline and outside of the shoreline setback area (40 ft inland from the shoreline). *Appendix A* shows the certified shoreline delineated in 1983 along the face of the seawall which remains in good condition today.



Figure 2.1

Existing Conditions



Figure 2.2

Conceptual Site Plan (Source: Design Partners Incorporated)

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Figure 2.3

Rendering of the Residence from Kāhala Avenue (Source: Design Partners Incorporated)

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Figure 2.4

Rendering of the Residence Looking Mauka (Source: Design Partners Incorporated)

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Landscaping and Fencing

The physical development of the Kāhala coastline is dependent upon integrating the natural shoreline and built environment together. Key elements in this integration are the appropriate design, context, and materials used in developing the overall landscaping and exterior features of the area. There will be new landscaping established along the perimeter of the property and also integrated throughout the site. The two-part plant palette stresses elegance & simplicity. The makai lawn, because of its proximity to the ocean, will feature coconut palms (*Cocos nucifera*), turfgrass (*Paspalum vaginatum*) and coastal shrubs at the side boundary walls. These are a combination of both native species and non-native shrubs from similar coastal areas, as suggested in *Figure 2.5*. Preliminary plans include planting a line of Dwarf Natal plum (*Carissa sp.*) immediately behind the seawall. This would be trimmed to a low height and maintained at 18 to 24 inches tall.

The mauka side of the property will be mostly lawn and ornamental shrubs. The owner has asked for a garden area with *ikebana* plants, or floral arrangement species. Although a design is not yet available for this garden area, conventional landscape plants will be used. A single large canopy tree is proposed near the northeast mauka corner. The Kāhala Avenue boundary will have a 6-foot coral veneer wall softened by massed raphis palms (*Rhapis excelsa*) with a grassy verge beneath on the street side and massed Allspice trees (*Pimenta dioica*) on the makai side for privacy and noise abatement. Side boundary walls are already existing and have been planted with vines.

The planting plan and irrigation plan are currently being designed. It is anticipated that conventional sprinklers rather than drip irrigation will predominate. Coastal plants grow better when the soil is regularly flushed of accumulated salts by rainfall or conventional irrigation rather than by drip systems. Much of the landscape area will be open lawn, where drip systems are not practical. Drip systems are likely to be used alongside the boundary wall planting areas and small landscape zones near the house. A rain sensor will be included to minimize water wastage.

2.3 LUO Requirements

The residential land use of the site is governed by development requirements, such as density, lot coverage, setbacks (required yards), and height per the Land Use Ordinance (LUO), Chapter 21, Revised Ordinances of Honolulu (ROH), and the rules of the Special Management Area.

The property is zoned R-7.5 Residential with a total land area of 0.813 acres (35,428 sf), which allows for development of up to 4.72 dwelling units. The development program is for two dwellings, or less than the total allowed density of four dwellings. The site development will include one single family home and a guest cottage (*Figures 2.6 to 2.8*), under provisions of the LUO. The site will have the main home located on the central portion of the site, and the guest cottage on the mauka portion of the site.

The new residence will be a single-story home with classic kama'aina-style design in keeping with the Kāhala neighborhood setting (*Figures 2.3 and 2.4*). The residence and guest cottage are designed to maintain an appropriate sense of scale with the large property and the surrounding area. Buildings will not exceed the 25-foot height limit for structures in the R-7.5 Residential District (*Appendix B*). Design and construction of the residence will adhere to the development standards for R-7.5 Residential zoning as defined by the LUO. The applicable LUO development standards are shown below in *Table 2.1*.

Table 2.1 LUO Development Standards		
LUO Standard	R-7.5 Zone	Project Plans (all in compliance)
Minimum Lot Area	7,500 square feet	35,248 square feet
Front Yard	10 feet	50 feet
Side Yard	5 feet	5 feet
Maximum Bldg. Area	50% of zoning lot	20% of zoning lot
Maximum Height	25 feet	25 feet
Multiple Homes on a Lot (LUO Section 21-8.20A)	Maximum of 4 dwellings on single zoning lot. Lot area must be equal or greater than minimum lot size for underlying zoning district, times the number of dwelling units.	One home and one guest cottage proposed.

The new home will be located over 55 ft from the shoreline. The existing seawall structure is located within the shoreline setback and classified as a nonconforming structure, as it was built prior to the 1976 Shoreline Setback Ordinance.

2.4 Sustainable Design

The building design and construction will incorporate sustainable design standards and practices. Design strategies will include incorporating natural lighting to illuminate interior spaces, efficient plumbing systems which require low demand water, and Volatile Organic Compound (VOC)-free building materials and finishes to provide healthy interior environments. The new residence is anticipated to incorporate renewable energy technology, energy conservation best practices such as energy-efficient mechanical and electrical systems to maximize energy savings, and provisions for electric vehicle (EV) compatible parking. Buildings will incorporate architectural design features such as energy-efficient windows to decrease cooling loads on the building and increase interior thermal comfort levels.

2.5 Construction Characteristics

The property requires very limited vegetation clearing, grubbing, site mass grading and fill. General construction trades will be engaged to construct the home. There will be limited excavation for site utilities and drainage. Refer to *Chapter 3.13 Utilities* for more detailed information. Extensive landscaping will be established throughout the property.

2.6 Summary of Projected Costs

A total development cost of \$4.0M has been estimated for the development of the residence, guest cottage, garage, utilities, landscaping and site improvements.

2.7 Schedule

Planning and permitting for construction of the residential development is anticipated to be completed by Q1 2022. Site and building designs should be completed by Q1 2022, with site construction and building permits anticipated for approval by Q3 2022. Site development will follow with anticipated completion in Q3 2023.



Vine Alternatives near Coastline

Left to right: Beach Morning Glory / Poehue; Coastal Morning Glory / Koali-awa; Ivy-leaved Morning Glory / Koali'ai; Indian Morning Glory / Koali'awa (pink); Hunakai
None are 'climbers' - all would need to be started into mesh



Seaside Standbys

Clockwise: Beach Heliotrope (tree); Seagrape (tree); Dwarf Hau (tree); Naupaka (big shrub)



Hardy Coastal Shrubs

Clockwise: Pittosporum; Natal Plum (& dwarf Natal Plum); Ixora (medium size only); Wheelers Dwarf Pittosporum; Variegated Pittosporum

These could be used in small masses. They all grow to reasonable sizes. All of these can be trimmed to size & shape.



Smaller Coastal Plants

Left to right: 'Ilima; Pohinahina (Beach Vitex); Akia; Indian Fleabane; Hinahina
These could be used in foreground areas between lawn & shrubs.

Figure 2.5

Proposed Plant Palette

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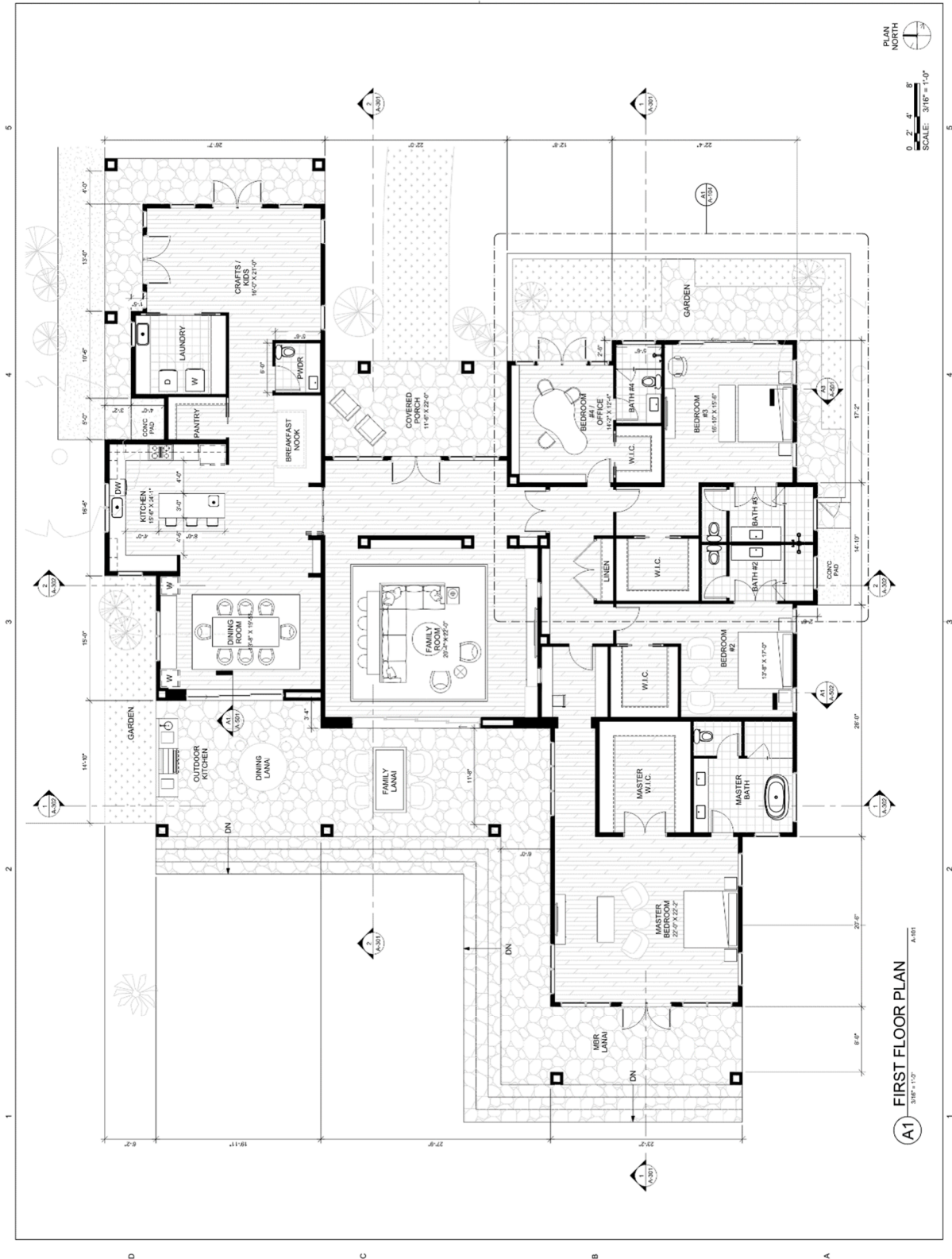


Figure 2.6

Main Residence Floor Plan

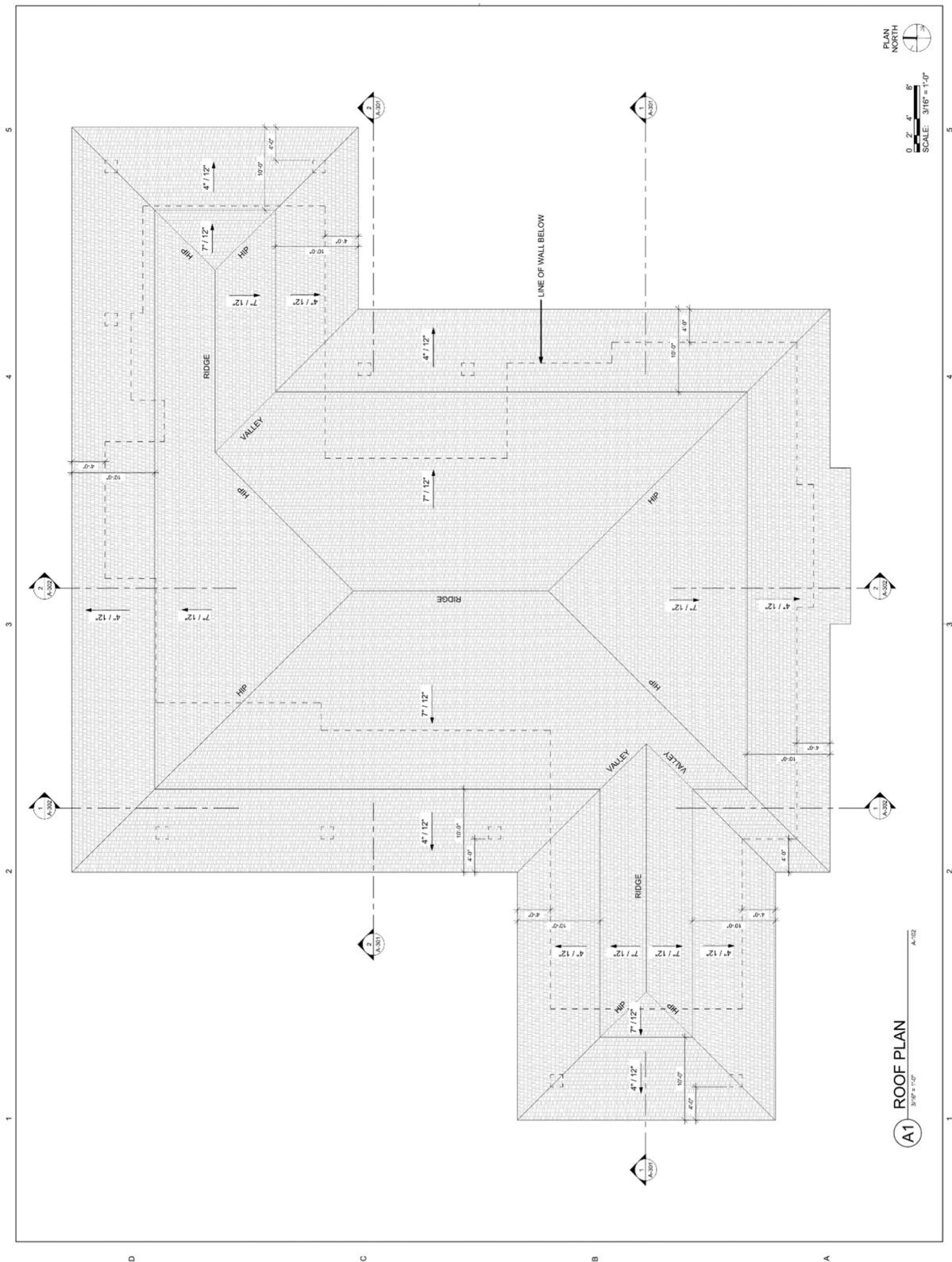


Figure 2.7

Main Residence Floor Roof Plan

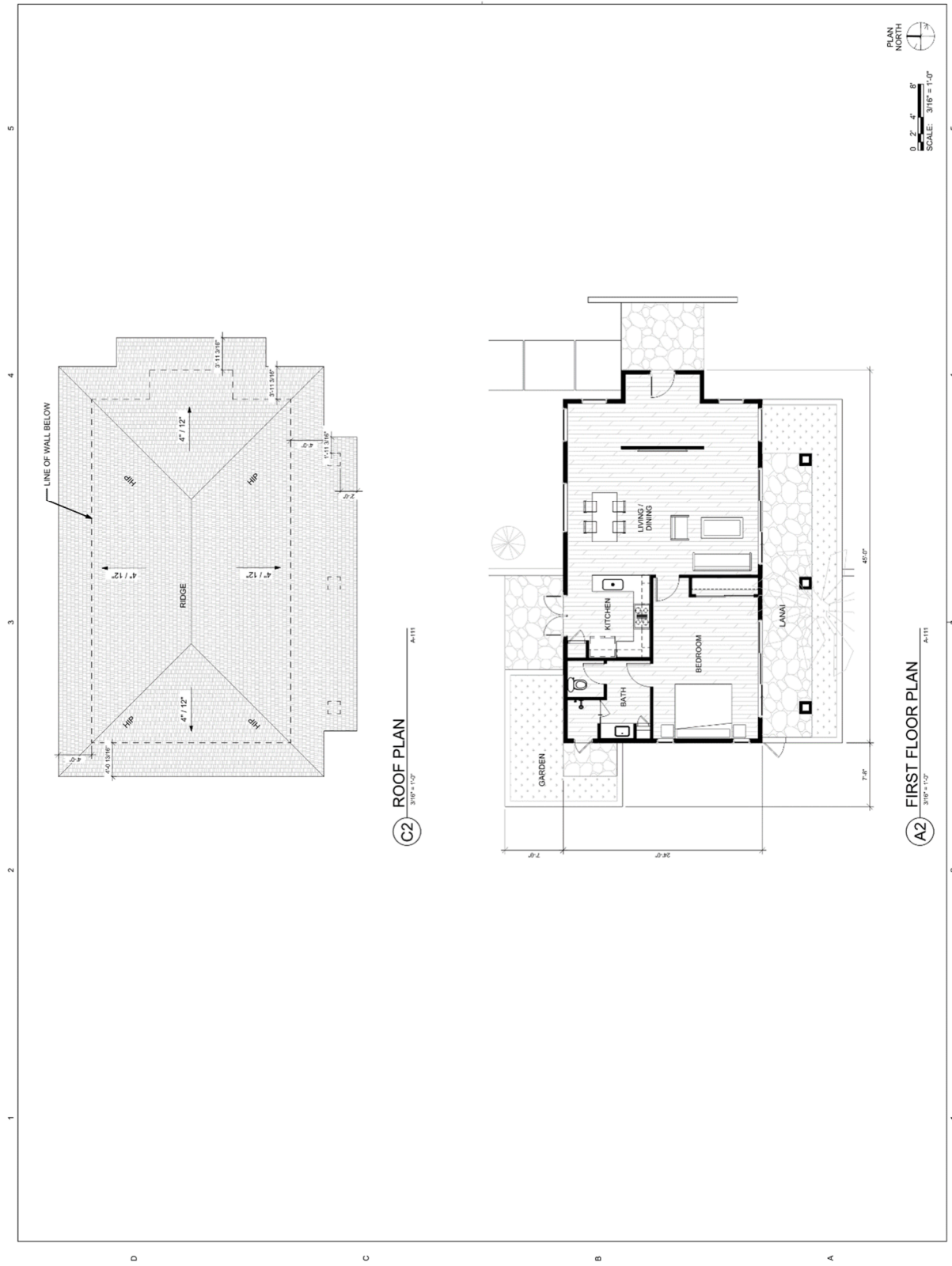


Figure 2.8

Guest Cottage Floor Plan and Roof Plan

**Environmental Setting,
Potential Impacts,
and Mitigation Measures**



Chapter 3

Environmental Setting, Potential Impacts, and Mitigation Measures

The environmental setting, potential impacts, and mitigation measures for the proposed residence are addressed in the sections below.

3.1 Topography, Soils and Grading

Existing Conditions

The terrain within the property is evenly graded throughout. The property has little grade change, with elevations between 7.5 to 9.5 ft above mean sea level (MSL) gently sloping towards the shoreline (*Figure 3.1*). Soil types within the property are identified in the U.S. Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey. As depicted in *Figure 3.1*, the property consists of Beaches (BS) and Jaucus Sand (JaC), 0 to 15 percent slopes. BS areas consist of light-colored sands of seashells and coral and drain excessively with low runoff. JaC soil permeability is also rapid and runoff is very slow. The water erosion hazard is slight, with wind erosion potential in places where the soil is not anchored by vegetation.

Anticipated Impacts and Proposed Mitigation

The residential use will not change the overall soil composition at the property. Limited grading is required for construction, in order to facilitate site drainage and landscaping. The existing concrete slab will be demolished. The property will be in a gravel fill condition at finished floor elevation (FFE) = 9.5 for the main house, guest house and garage, approximately 10 inches above the existing grade. The main house and guest cottage will be constructed with a 4.5-inch slab on grade and base course, with a foundation depth maximum of 18 to 24-inch thickened slab edges. Best Management Practices will be implemented pursuant to the Grading Permit to mitigate potential soil erosion and fugitive dust during grading and utility excavation. Minor grading will occur crossing the center of the property and dropping off on both sides. The middle pathway to the entry will be high and dry.

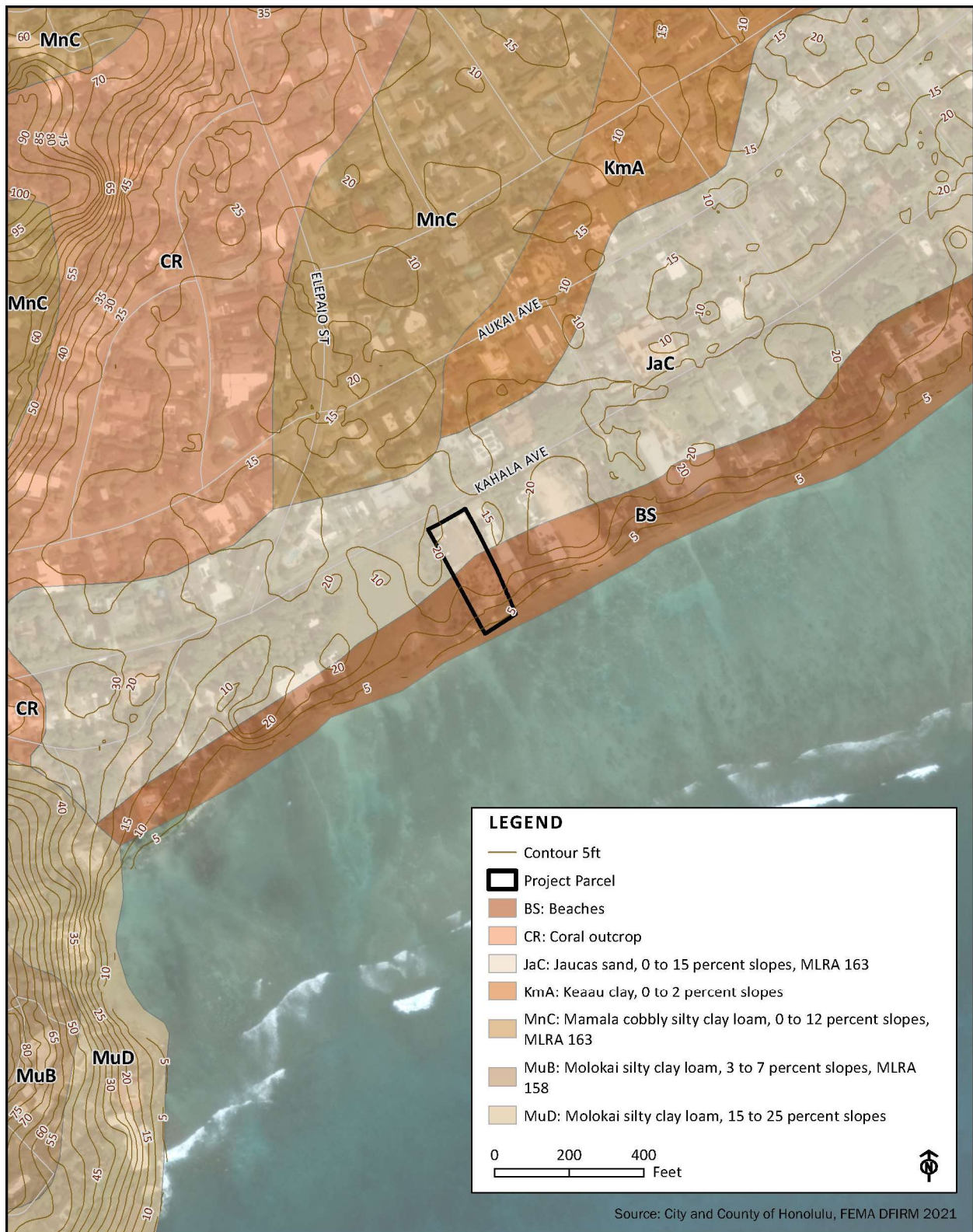


Figure 3.1

Topography and Soil Classifications

3.2 Near Shore and Ground Water Resources

Existing Conditions

There are shallow near shore waters off the existing property that sustain limited recreational fishery resources. Ocean water in Kāhala is rated by the State as Class A. It is the objective of Class A waters that their use for recreational purposes and aesthetic enjoyment be protected. Any other use is permitted as long as it is compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class.

The residential property lies above the Waialae aquifer system, which has an upper and lower aquifer. The aquifer is not suitable for drinking, as evidenced by its location below the Underground Injection Control (UIC) boundary. The upper aquifer is a basal aquifer type where fresh water is in contact with saltwater. The unconfined aquifer has a water table that is at the upper surface of a saturated, sedimentary aquifer of non-volcanic lithology. The groundwater has a potential use, but the utility is neither for drinking or ecologically important, with a high salinity of 5,000 to 15,000 milligrams per liter (mg/L) of chloride.

The lower aquifer is also basal, but confined, where the aquifer is bounded by impermeable or poorly permeable formations, and the top of the saturated aquifer is below the groundwater surface. This is a flank aquifer type with horizontally extensive lavas. The groundwater has a potential use for drinking water, with a fresh water salinity less than 250 mg/L of chloride. It has an irreplaceable uniqueness and low vulnerability to contamination. There is no groundwater well at this site.

Anticipated Impacts and Proposed Mitigation

Potential impacts to near shore or ground water resources are not anticipated. This is due to the previous and planned residential use of the site. Property drainage designs will comply with current Department of Planning and Permitting standards. No wells are proposed for this residence and use of the property will have no effect on the groundwater recharge cycle.

3.3 Climate

Existing Conditions

Climate on O'ahu can be characterized as having low day-to-day and month-to-month variability. Differences in the climates of various areas are generally attributable to the island's geologic formation and topography creating miniature ecosystems ranging from tropical rain forests to drier plains, along with corresponding differences in temperature, humidity, wind, and rainfall over short distances. Annual and daily variation in temperature depends to a large degree on elevation above sea level, distance inland, and exposure to trade winds.

Winds are predominantly "trade winds" from the east-northeast, except for occasional periods when "Kona" storms may generate strong winds from the south, or when the trade winds are weak and land breeze to sea breeze circulations develop. Wind speeds typically vary between about 5 and 20 miles per hour providing relatively good ventilation. Lower velocities (less than 10 miles per hour [mph]) occur frequently, and the typical northeasterly trade winds tend to break down in the Fall giving way to lighter, variable wind conditions through the Winter and into early Spring.

The area's temperatures generally have small seasonal variations between the warmest months (August and September) and the coolest months (January and February). Daily maximum temperatures usually run from the low-80's in winter to the low-90's in summer, while daily minimum temperatures run from the mid-60's to the low-70's, respectively.

In general, rainfall is highly variable depending upon elevation and location with respect to trade winds. The Lē'ahi area is one of the drier regions of O'ahu, with an average annual rainfall of about 25 inches. Most of the rainfall occurs during winter storms, usually taking place from October through April.

Global climate change has been associated with changes in Hawai'i's local climate. The University of Hawai'i, Center for Island Climate Adaptation and Policy published a *Briefing Sheet* summarizing specific changes observed in Hawai'i (Fletcher, 2010). Based on peer-reviewed scientific journals and government reports, it presents evidence of climate change in Hawai'i as:

1. Rising surface temperature,
2. Decreased rainfall and stream flow,
3. Increased rain intensity,
4. Increased sea level and sea surface temperatures, and
5. Ocean acidification.

Due to the heat-trapping effects of greenhouse gases (GHG), climate scientists project that if GHG emissions continue to accelerate at current output trends, then the average global temperature will likely increase by three to seven degrees Fahrenheit (1.7 to 3.9 degrees Celsius) by the year 2100. These figures were derived from a number of global climate models, which were based on various scenarios of changes in the concentrations of GHG in the Earth's atmosphere.

As the Earth's atmosphere warms, so do the oceans; and as seawater warms up it expands, increasing the total volume of the oceans and producing thermosteric sea level rise (SLR). Global average thermal expansion can be calculated directly from simulated changes in ocean temperature. Additional information regarding SLR is located in *Chapter 3.3 Natural and Manmade Hazards*.

Anticipated Impacts and Proposed Mitigation

Construction-related activities are anticipated to generate limited GHG emissions from the generation of exhaust and will adhere to State Department of Health (DOH) Air Quality Standards as discussed in *Chapter 3.9 Air Quality* to minimize short-term impacts. Construction-related impacts will be temporary and cease upon the completion of the residential development. The installation of landscaping such as shade trees and grass will help to mitigate and absorb local GHG emissions over the long term.

The impacts of GHG emissions are inherently indirect and cumulative. The construction and operation of the residential development is not anticipated to have a direct significant impact on the climate or significantly contribute to climate change, as proposed improvements will not lead to a substantial increase in GHG emissions as compared to baseline conditions. No additional mitigation is recommended.

3.4 Natural and Manmade Hazards

3.4.1 Hurricanes, Tropical Storms, Winds and Storm Surge

Existing Conditions

Hurricanes and tropical storms are both categorized as tropical cyclones, which are warm-core storms that originate over tropical waters with well-defined centers of closed surface wind circulation. A hurricane is a tropical cyclone which sustains surface winds of 64 knots (74 mph) or more. Tropical storms are categorized as an organized system of strong thunderstorms with defined circulation and maximum sustained winds of 39 to 73 mph (National Oceanic and Atmospheric Administration [NOAA], 2015). Tropical cyclones are characterized by very heavy rainfall and strong and damaging winds that can generate storm surge and extremely high waves. A storm surge can be defined as an abnormal rise of water generated by the winds of a storm, over and above the predicted astronomical tide.

Hurricanes are considered to be relatively rare events in the Hawaiian Islands, although records show that strong wind storms have struck all major Hawaiian Islands. The first officially recognized hurricane in Hawaiian waters was Hurricane Hiki in August 1950. Since that time, five hurricanes have caused serious damage in Hawai'i: Nina (1957), Dot (1959), 'Iwa (1982), Estelle (1986), and 'Iniki (1992).

However, with rising global temperatures, Hawai'i is expected to experience a higher incidence of tropical storm events. In most recent history, Tropical Storm Olivia made landfall on Maui and Lāna'i in 2018, causing considerable flooding, power outages, and road and school closures. Also, in 2018, Tropical Storm Lane never made landfall in Hawai'i but unleashed record-breaking rainfall across parts of the island chain, causing considerable flooding and damage.

During normal conditions in the Pacific Ocean, trade winds blow west along the equator, taking warm water from South America towards Asia. To replace that warm water, cold water rises from the depths – a process called upwelling. El Niño is a climate pattern that breaks these normal conditions, weakening upper-level trade winds and pushing warm water back east, toward the west coast of the Americas. The typical influence of El Niño causes more hurricanes in the eastern and central Pacific basins due to less vertical wind shear. Strong vertical wind shear can typically rip a developing hurricane apart, or even prevent it from forming. Overall, average daily wind speeds are slowly declining in Honolulu, and the frequency of gale-force winds is decreasing in the central Pacific (Marra, 2017).

Computer model projections of tropical cyclone activity and El Niño patterns in the central North Pacific indicate increasing risk (in intensity and doubling frequency) of hurricanes for Hawai'i as the world warms (HCCMAC, 2017). Strong El Niño years in Hawai'i bring more hot days, windless days, intense rains, active hurricane seasons, spikes in sea surface temperature, and combined with rising sea levels, a growing vulnerability to low-lying coastal flooding and erosion. It is practical to expect that a hurricane will make direct landfall in Hawai'i under conditions of higher sea levels and that tsunamis will continue to arrive at Hawaiian shores.

Anticipated Impacts and Proposed Mitigation

National Hurricane Storm Surge Hazard Maps indicate the coastal area along the property may be subject to storm surge flooding inundation of greater than 3 ft but less than 6 ft above ground level during a Category 1 hurricane event. The 8.0 ft high seawall and location of the residence 60 ft away from the shoreline should protect the property from storm surge flooding up through a Category 2 or

3 hurricane event where storm surge is modeled to reach greater than 6 ft above the ground. In addition, the property will be in a gravel fill condition at FFE = 9.5 for the main house, guest house and garage, in the event the storm surge overtops the wall with a storm surge modeled at greater than 9 ft in a Category 4 hurricane.

All construction will conform to relevant building codes to mitigate the risk of wind damage. When a hurricane is approaching a coastal location, early evacuation is usually standard mitigation to address the possibility of accompanying storm surge with high winds. The National Weather Service provides guidance, and when necessary, during an event issues a hurricane watch when a storm is expected to make landfall within 36 hours. A hurricane warning is issued when landfall is likely within 12 to 24 hours.

3.4.2 Earthquakes and Subsidence

Existing Conditions

The majority of earthquakes in Hawai'i are directly related to volcanic activity on the Island of Hawai'i. Per the 2015 United States Geological Survey (USGS) International Building Code (IBC) seismic design maps, Honolulu could experience seismic activity around 0.15 of the earth's gravitational acceleration (g-force). In contrast, the Mauna Loa and Kīlauea Volcanoes on Hawai'i Island could experience up to 1.47 g-force.

Subsidence is a geologic phenomenon where the land gradually sinks in elevation due to underground material movement. Subsidence is most often caused by the removal of water or mineral resources out of the ground by pumping or mining activities, but can also be caused by natural events such as earthquakes, active volcanism, soil compaction, erosion, sinkhole formation, and adding water to fine soils deposited by wind (a natural process known as loess deposits). The rate of absolute subsidence increases progressively toward the center of current volcanic activity on the Island of Hawai'i and decreases progressively moving further away towards Honolulu, O'ahu, which appears to be relatively stable in the vertical. Subsidence can cause beach erosion and increase vulnerability to sea level rise.

Anticipated Impacts and Proposed Mitigation

All buildings for the planned improvements will be constructed in compliance with regulatory controls to meet City Building Code requirements as appropriate to IBC seismic probabilities. While the risk for subsidence on the property is low, gravel fill will be used to elevate surfaces, structures, and utilities to FFE= 9.5.

3.4.3 High Tide Flooding, High Wave Flooding and Tsunami

Existing Conditions

Based on the Federal Emergency Management Agency's Digital Flood Insurance Rate Map (DFIRM) data, effective 2021, the area is located in Zone X, and a small portion along the coastline in Zone VE. The parcel is also located within the designated tsunami zone (*Figure 1.6*). The Flood Zone X designation indicates the home will be outside of the 0.2% annual chance floodplain. This portion of the subject parcel is not located in a Special Flood Hazard Area as defined by LUO Section 21A (see *Section 5.8*). The Zone VE designation along the water's edge indicates that the area is in a coastal flood zone with velocity hazard (wave action).

High-tide flooding events occur when local sea level temporarily rises above an identified threshold height for flooding, in the absence of storm surge or riverine flooding, causing a public inconvenience

(such as overwhelmed storm drains, groundwater inundation and road closures). As relative sea level increases, it no longer takes a strong storm or a hurricane to cause coastal flooding. Tidal flooding now occurs with exceptionally high tides in combination with high waves in many locations due to climate-related sea level rise, land subsidence, and the loss of natural barriers. The frequency of minor flooding at the Honolulu Tide Station from the 1960’s to the year 2005 increased from 6 to 11 times per year on average (Marra, 2017).

A model of high tide flooding for the Honolulu Tide Station was published by NOAA in 2018. Relative to mean higher high water (MHHW), the threshold for minor high tide flooding is 1.7 ft (0.52 m). Moderate high tide flooding is 2.6 ft (0.8 m), and major high tide flooding is 3.8 ft (1.17 m). From this model, it is expected that high tide flooding will arrive decades ahead of global mean sea level rise. High tide flooding, as defined by NOAA, has never occurred at the Honolulu Tide Station as none of these thresholds has ever been crossed. *Table 3.1* provides estimates from the NOAA model for when minor high tide flooding will arrive in Honolulu 6, 12, and 24 days per year.

Table 3.1 Forecast for Minor (1.7 ft) High Tide Flooding in Honolulu			
Scenario	6 x per year	12 x per year	24 x per year
Intermediate	2038	2041 - 2042	2044 - 2045
Intermediate High	2030	2033	2035 - 2036
High	2025 - 2026	2028 - 2029	2030 - 2031
Extreme	2024	2026	2028 - 2029

The City Climate Change Commission stresses that impacts from high tide flooding will be observed decades before permanent inundation by sea level rise. Tidal flooding will become more frequent and more damaging as ocean levels rise. Even smaller tide heights, when convergent with rainfall, will impede drainage leading to flooded roads and properties, and disrupt traffic.

Hawai'i is also exposed to annual high waves on all open coasts due to its location in the Central North Pacific Ocean. High wave events generated by distant and localized storms combined with extreme high tides frequently cause damaging over-wash and flooding. Annual high waves, which arrive in Hawai'i seasonally, will flood further landward and cause more damage, as sea level continues to rise. High wave flooding will occur at high tide during typical seasonal swell events as waves run-up past the shoreline and into the backshore.

Tsunamis hit O'ahu in 1946, 1952, 1957, 1960, and 1964, and more recently, 2011. Damaging flooding can increase in low-lying coastal areas when infrequent events such as tsunamis strike, and tsunami occurring at high tide will cause greater flood damage than historically. Records show that the property's seawall was repaired under a City permit approval in May 1946 due to the April 1, 1946 tsunami.

Anticipated Impacts and Proposed Mitigation

High tide flooding can have several effects, such as pronounced beach erosion and storm drain flooding where runoff cannot drain and causes flooding around storm drain sites. Due to the 8.0 ft high seawall, the residence will be protected from high tide flooding. There are also no City storm drains located at the frontage of the property (see *Section 3.9.3*). High tide flooding could also potentially cause groundwater inundation where the water table rises to break the ground surface and

creates a wetland. Archaeological trenching (Keala Pono, 2021) to depths of 2 to 3 ft did not hit the water table on the property. It is expected that groundwater inundation of 1.7 ft will not push the water table to the ground surface at this location.

The maximum annual high wave parameters (significant wave height, period, direction) were statistically determined using historical wave climate records. Waves are propagated along a “bare earth” digital elevation model (DEM) which is void of shoreline structures, buildings, and vegetation, and waves are assumed to flow over an impermeable surface. The 1D wave modeling does not account for the presence of nearby shallow reef which refracts and dissipates some of the wave energy traveling through the channel toward the shore. There is approximately 700 feet of shallow reef fronting the coastal property of 4439 Kāhala; it is expected that this reef, along with the 8.0 ft high seawall, and over 60 ft of grass lawn overlying permeable, excessively drained Beaches (BS) soil will protect the home from high wave run-up.

The proposed residence is located within Flood Zone X; therefore, will comply with necessary design requirements and flood plain management standards. Construction work will be performed in accordance with the State and County-approved design standards. New drainage infrastructure will be designed and constructed to meet applicable standards. Coastal flooding from high tides and annual high waves can result in damage to structures and their contents. Although no significant adverse effects are anticipated, the property owner is encouraged to purchase flood insurance. In the event of a tsunami, occupants will need to evacuate the property to avoid risk of tsunami inundation.

3.4.4 Climate Change and Sea Level Rise

Existing Conditions

Rapid anthropogenic climate change is a well-established fact within the scientific community. A 2014 study by the University of Hawai‘i at Mānoa Sea Grant College Program predicts that tropical regions will experience drastically warmer climates by the year 2047. As a result of climate change, oceans are warming and acidifying, ice sheets and glaciers are melting, and sea levels are rising.

In addition to rising temperatures, sea level rise (SLR) is a notable concern for coastal communities. SLR has historically driven shoreline changes throughout the Hawaiian Islands. The global annual SLR averaged over the last century was roughly two millimeters, with previous studies indicating that this rate is now approaching three millimeters and may accelerate in the coming decades. According to the 2017 Hawai‘i Sea Level Rise Vulnerability and Adaptation Report, the sea level in Hawai‘i has increased at a rate of 0.6 inches or more each decade over the past century.

The 2018 Sea Level Rise Guidance by the City Climate Change Commission notes that rising seas threaten human communities and natural ecosystems in multiple ways. Urbanized coastal areas will become increasingly vulnerable to four types of flooding during high water and high wave events, including 1) flooding across the shoreline due to wave run-up; 2) saltwater intrusion of engineered drainage systems; 3) groundwater inundation, affecting buried infrastructure and formation of new wetlands; and 4) rainstorms, especially concurrent with high tide. Other threats include land loss and coastal erosion, increased wave energy at the shore, and further inland flooding from annual high wave activity.

While predicting future SLR is challenging because of unknown parameters, research shows that global MSL (GMSL) may rise approximately one foot by mid-century and 2.5 to 3.2 ft by 2100, with some studies showing an extreme scenario of 3.2 ft by mid-century. According to the Mayor’s Directive 18-2 and the

recommendations provided in the 2017 SLR Vulnerability and Adaptation Report and associated Hawai'i Sea Level Rise Viewer (PaclOOS, 2021) as resources for managing assets, an appropriate planning target to use in the design of future projects would be 3.2 ft sea level rise exposure area (SLR-XA) by mid-century, as it is expected that impacts to O'ahu from high tide flooding will be observed decades before permanent inundation by sea level rise.

Anticipated Impacts and Proposed Mitigation

The coastal property is susceptible to SLR. The State Pacific Islands Ocean Observing System SLR Viewer (PaclOOS, 2021) is a modeling tool using the best available data and methods to determine the potential future exposure of each island to multiple coastal hazards because of sea level rise. Three chronic flooding hazards were modeled: passive flooding, annual high wave flooding, and coastal erosion. The footprint of these three hazards were combined to define the projected extent of chronic flooding due to sea level rise, called the sea level rise exposure area (SLR-XA). Flooding in the SLR-XA is associated with long-term, chronic hazards punctuated by annual or more frequent flooding events (such as hurricanes and tsunamis). Each of these hazards were modeled for four future sea level rise scenarios: 0.5 ft, 1.1 ft, 2.0 ft and 3.2 ft.

As with all models, the SLR viewer comes with assumptions and limitations. For example, for the annual high wave flooding modeling, waves are propagated along a "bare earth" digital elevation model (DEM) which is void of shoreline structures, buildings, and vegetation, and waves are assumed to flow over an impermeable surface. The 1D modeling does not account for the presence of nearby shallow reef which refracts and dissipates some of the wave energy traveling through the channel toward the shore. Modeling for coastal erosion does not account for existing seawalls or other coastal armoring in the backshore.

According to the SLR viewer, approximately 40 ft inland from the shoreline (wall) of the property is anticipated to be subject to 0.5 ft of SLR in the near-term, and the SLR-XA 1.1 ft exposure projection could extend about 50 to 60 ft inland. The predictive extent in the generalized mapping generated in the more extreme SLR-XA 2.0 ft and SLR-XA 3.2 ft models shows some overlap with the current planned location for the home, without considering the effectiveness of shoreline protection and site grades (*Figures 3.2, 3.3*).

There are several measures taken with the 4439 Kāhala property which will accommodate for rising sea level over many decades ahead, well beyond the mid-century 2050 horizon (30 years from now). First, the top of the existing seawall is approximately 8.0 ft above current sea level, which will strictly limit the incursion of rising sea level and potential threats to the residential structure. Second, the new residence will be set back over 60 ft from the shoreline (horizontal retreat), well beyond initial phase projections of SLR without accounting for mitigating factors of shoreline condition and grades. This setback distance is already 50% greater than the required 40 ft shoreline setback. Third, the levelled pad for the homesite and concrete slab will set at a base elevation of 9.5 ft (another 1.0 ft above the existing grade), and utilities (such as electrical and water lines) will be elevated instead of located underground (vertical retreat). Pervious pavements and the large grassy areas and landscaped areas will be used to increase on-site infiltration, and the site will be graded along the eastern and western edges so that stormwater will settle and drain into the bioswales, keeping the structures dry.

The above measures taken to mitigate impacts to infrastructure and the home subject to sea level rise exposure need to be considered when reviewing the potential SLR-XA exposure to the structures as portrayed by the SLR-XA model (*Figure 3.3*).



Figure 3.2

3.2 ft Sea Level Rise Exposure Area (SLR-XA)



Figure 3.3

Site Plan with Setbacks and 3.2 ft SLR-XA

3.5 Flora and Fauna

Existing Conditions

Flora

The ground surface of the property has been completely disturbed with residential development and accessory structures for many decades. The parcel supports few remnants of prior landscape vegetation, including a few Singapore plumeria (*Plumeria obtusa*) trees, two Royal Palms (*Roystonea regia*), a transplanted Loulu Palm (*Pritchardia spp.*) and a Lignum vitae (*Guaiaecum spp.*).

There are also eight tall coconut palms (*Cocos nucifera*) growing in the Kāhala Ave right-of-way. These are senescent - very old and nearing the end of their lives as landscape plants. As they die, it is not intended to replace these. The two side boundary walls have been planted with flowering vines; Black-eyed Susan vine (*Thunbergia alata*) on one side and Sandpaper Vine (*Petrea volubilis*) on the other.

There are no species of plants of conservation concern or listed as threatened or endangered at the property.

Fauna

Few fauna or avian species were observed during a property visit; however, it is expected that commonly established alien rodent and avian species occur on the property. Common rodent species include the roof rat (*Rattus rattus*), Norway rat (*Rattus norvegicus*), small Indian Mongoose (*Herpestes auropunctatus*), house mouse (*Mus musculus*) and house cat (*Felis catus*).

Several introduced birds could be seen on the subject property, including Japanese white-eye (*Zosterops japonica*), Java sparrow (*Padda oryzivora*), Spotted dove (*Streptopelia chinensis*), Zebra dove, (*Geopelia striata*), house finch (*Carpodacus mexicanus*), and Red-vented bulbul (*Pycnonotus cafer*).

The indigenous Wedge-tailed Shearwater (*Puffinus pacificus*) is known to have a small established colony in the Black Point area of Kāhala, which is located approximately 0.4 miles west of the property. The Wedge-tailed Shearwater is not a listed species under the Endangered Species Act, but they are protected under the Migratory Bird Treaty Act (MBTA). In addition, there is a potential that the endangered Hawaiian petrel (*Pterodroma sandwichensis*), threatened Newell's shearwater (*Puffinus auricularis*), and band-rumped storm petrel (*Oceadroma castro*) may exist within the vicinity of the property. There is no evidence or accounts of the shearwaters or petrels nesting at or near this property. No nesting seabirds were found on or near the property.

No federally or state designated Critical Habitat occurs in the vicinity.

Anticipated Impacts and Proposed Mitigation

Vegetation removal and property clearing and grading will affect the existing exotic shrub and ground cover species. The property will be landscaped to include non-invasive indigenous, Polynesian-introduced, and introduced plant species. Drought-tolerant species will be used, wherever possible, to minimize irrigation requirements and water needs (*Figure 2.5*).

Although no nesting sites or seabirds were identified during survey of the subject property, shoreline vegetation at the property poses the remote potential to support shearwater nesting. Prior to construction,

the shoreline area will be inspected during the species' peak breeding season (August through October) to ensure the area is free of seabird nests. Outdoor lighting for the residential development will be designed with sensors, shielding, and directed downward to avoid attracting seabirds. Construction activities will be limited to daylight hours to avoid the use of construction work lights.

The development and operation of the residence is not expected to result in adverse effects to endangered or threatened plant or animal species. There will be no adverse effects on the area's wildlife or habitat.

3.6 Archaeological and Cultural Resources

An Archaeological Inventory Survey (AIS) was completed of the subject property by Keala Pono Archaeological Consulting, LLC (Keala Pono) (April 2021) resulting in an Archaeological Assessment report (*Appendix C*). This study addressed the potential for archaeological resources and historic properties, and provides recommendations as related to the State of Hawai'i's historic review process.

Existing Conditions

The property is situated on what was a large Land Commission Award known as Kānewai-Kahala, LCA 228:2. It was awarded to Kalaiheana, a kahu of King Kamehameha II. According to LCA documentation, the 173-acre plot of land contained one house lot, one lo'i, a road/path, and a wall/fence. The property is located along the native coastline, and underlying soils consist of Beach Sand and Jaucas Sand, an environment traditionally favored for human burials.

Based on a review of land use and previous archaeological investigations, there is high potential for historic properties to occur in the area. Previous archaeological studies have identified iwi kūpuna, as well as pre- and post-contact artifacts and features in other coastal properties in Kāhala. On the adjacent parcel, archaeological findings include four human burials, two cultural layers, and an A-horizon that contained historic artifacts (SIHP 5320).

A preliminary field inspection and survey work was conducted by Keala Pono in April 2021. A surface pedestrian survey was conducted across 100 percent of the property. No significant historic or cultural properties were identified during the pedestrian survey.

Subsurface testing was conducted during the Archaeological Assessment in order to identify potential human alteration, archaeological features, and associated artifacts in subsurface contexts. Five subsurface test trenches were mechanically excavated during the survey. All excavations produced negative results.

The pedestrian survey and subsurface testing conducted in April 2021 revealed that no cultural or historic sites or features were identified in the property. Several of the test trenches encountered buried A-Horizon soils, but no cultural material was discovered. Refer to *Appendix C* for the testing results.

Anticipated Impacts and Proposed Mitigation

Background research indicates that the planned residence will have no impacts to Hawaiian cultural beliefs, practices, resources (historic and/or cultural properties), sites, and traditions. Existing cultural practices that occur in the area will not be affected. Public access to the shoreline area will not be affected. Project personnel will be alerted to the potential for inadvertent cultural finds. Archaeological

monitoring is planned during construction. If iwi or cultural resources are found during the ground disturbance, cultural and lineal descendants of the area and appropriate agencies (e.g. State Historic Preservation District, Office of Hawaiian Affairs, O'ahu Island Burial Council) will be notified and consulted in regard to preparation of appropriate mitigation plans.

3.7 Socioeconomic Characteristics

Existing Conditions

The property is situated within the Census Tract 5 (Wai'alae-Kāhala). This area spans from Black Point Road to the east side of Wailupe Beach Park, from the shoreline mauka to Kalaniana'ole Highway. The information below presents a snapshot of census conditions for Census Tract 5 between the years 2013 to 2017.

From 2013 to 2017, the total population was 3,813, with a median age of 49.9 years. There were 1,347 households, with an average household size of 2.83 people. Families made up 72.4 percent of all households, and nonfamily households comprised 27.6 percent. 30.6 percent of all households had one or more people under the age of 18, and 48.1 percent of all households had one or more people 65 years and over. 91.3 percent of the people were living in the same residence one year earlier. From 2013 to 2017, 98.2 percent of people 25 years and over had at least graduated from high school and 61.3 percent had a bachelor's degree or higher.

Of the population 16 and over, 53.3 percent were employed, and 45.5 percent were not currently in the labor force. An estimated 81.1 percent of the people employed were private wage and salary workers, 10.2 percent were federal, state or local government workers, and 8.7 percent were self-employed in their own business. The median income of households was \$127,582. An estimated 76.0 percent of households received earnings. An estimated 45.2 percent of households received Social Security and an estimated 28.9 percent of households received retirement income other than Social Security, although these are not mutually exclusive.

During the period of 2013 to 2017, Census Tract 5 had a total of 1,690 housing units. 0.7 percent of the housing inventory was comprised of houses built since 2010, while 6.9 percent of the houses were first built in 1939 or earlier. Of these housing units, 83.7 percent were single-family houses. 16.2 percent of the housing units were located in multi-unit structures, or buildings that contained two or more apartments. The median number of rooms in all housing units in Census Tract 5 was 6.2 rooms, and of these housing units, 78.0 percent had three or more bedrooms.

There were 1,347 housing units that were occupied or had people living in them, while the remaining 343 were vacant. Of the occupied housing units, the percentage of these houses occupied by owners (or homeownership rate) was 81.0 percent, while renters occupied 19.0 percent. The median property value for owner-occupied houses in Census Tract 5 for 2013 to 2017 was \$1,662,900. Of the owner-occupied households, 50.2 percent had a mortgage. 49.8 percent owned their houses "free and clear," that is without a mortgage or loan on the house. The median monthly housing costs for owners with a mortgage was \$4,001 and for owners without a mortgage it was \$955.

Anticipated Impacts and Proposed Mitigation

The planned redevelopment of the property has no foreseeable negative impacts on the residential population of the area. The planned improvements will not affect land and housing speculation, property values of area homes, or affordable housing in the area.

The redevelopment of the property will have some short-term economic benefits resulting from the construction of the facilities. Construction will be completed by a local contractor. Total construction costs for the residence is estimated at approximately \$4.0M. Long-term economic benefits will also result from the taxes paid on the property, and the purchases that will be made in the area.

The planned improvements are not expected to result in significant impacts to the socioeconomics or environmental justice of the area. The surrounding area consists of low-density residential area with numerous parks and accesses to the beach. Redevelopment of this property will not change the characteristics of the residential Kāhala area.

3.8 Visual Resources

Existing Conditions

The property is located in Kāhala, along the shoreline approximately a third of the way between Diamond Head Crater and the Kāhala Hotel & Resort. Residential uses are located adjacent to the property on the east side and across the street, a vacant property on the west side, with the property fronting the ocean. *Figure 1.2* provides an aerial perspective of the general area.

The City and County of Honolulu Coastal View Study (1987) notes that the Maunalua Bay Viewshed, Kahala Section ranges from the Diamond Head lookouts to the Wai'ala'e Golf Course. Beyond the lookouts, no specific coastal views are present due to the established residential community. Significant public view locations have also been designated by the City and County of Honolulu Primary Urban Center Development Plan (2004). The property is not located within a Special District and does not lie within significant mauka-makai or east-west views.

The property is presently vacant and shielded from view by chain link fencing with privacy screens along the Kāhala Avenue frontage. The accompanying photos provide visual perspectives of the existing conditions of the property, and immediate vicinity. *Figure 3.4* is an aerial photo of the property with a key to photos depicting existing views and land uses. *Figures 3.4a to 3.4c* provide a selection of property photos. The property is surrounded by large lots or residential uses.

Anticipated Impacts and Proposed Mitigation

The construction of two residential units will include one home and a guest cottage as allowed per the LUO. *Figures 2.3 and 2.4* present renderings of the main home. View locations are from Kāhala Avenue and from the shoreline area. The rendering from Kahala Avenue is presented again in this section for ease of reference as *Figure 3.5*. The conceptual elevations show the residence and landscape which are compatible with the surrounding residential uses. The residential structures will conform to design controls established by the LUO, including the 25-foot height limit. Construction will observe a more than 40-foot setback from the shoreline, in accordance with ROH §23 Shoreline Setbacks. Landscaping will be used to improve the visual character of the property from public view locations, primarily the pedestrian and roadway perspectives along the beach and Kāhala Avenue. Prominent public vantage points will be maintained and the residential character of Kāhala will be preserved. No significant visual resource effects are anticipated.



Figure 3.4

4439 Kāhala Photo Key



Figure 3.4a

View Towards 4439 Kāhala Avenue Heading East



Figure 3.4b

View Directly Towards 4439 Kāhala Avenue



Figure 3.4c

View Towards 4439 Kāhala Avenue Heading West



Figure 3.5

Rendering of the Residence from Kāhala Avenue (Source: DPI)

3.9 Utilities and Infrastructure

The following section provides key highlights and assesses potential impacts of infrastructure and utility needs.

3.9.1 Water

Existing Conditions

Domestic Water

The existing potable water service to the Kāhala Avenue area is provided by the Honolulu Board of Water Supply (BWS). A 6-inch diameter BWS cast iron water main lies within Kāhala Avenue, on the mauka side of the roadway.

BWS distribution maps, record drawings, and consultation indicate onsite domestic water to the property is provided by a 1-inch water meter and 1.5-inch lateral (No. 01400673, Premise ID# 8790693399) located approximately in the middle of the lot, on the right side of the driveway apron. The water meter has a maximum flow rate of 160 gallons per minute (GPM) and a continuous flow rate of 80 GPM.

Fire Protection

A 6-inch diameter water main is located in Kāhala Avenue fronting the property, which serves multiple fire hydrants along Kāhala Avenue near the property. One fire hydrant, 1496 is located across the street fronting 4432 Kāhala Avenue.

Anticipated Impacts and Proposed Mitigation

Domestic Water

The property is currently served by an existing BWS 1-inch water meter which connects to the existing BWS water main within Kāhala Avenue. The property is anticipated to require up to 1,620 gallons per day (GPD) which can be accommodated by the existing BWS water main on Kāhala Avenue. Development of the property will conform to the City and County of Honolulu BWS Water System Standards. The owner will pay the BWS Water System Facilities Charges for resource development, transmission and daily storage. Existing water meters and laterals will remain in place and brought up to the surface, mounting lines on the lower section of the 'ewa concrete masonry unit (CMU) wall. The new water service line will be installed in a secure above-ground corridor with landscape screening.

Fire Protection

The existing fire hydrant located on Kāhala Avenue across from the property will not satisfy fire protection requirements for the new home. The lot is approximately 300 ft deep, and the new house will be located beyond the 150-ft hose lay length. It is anticipated that sprinklers will be provided. The property plan will comply with current National Fire Protection Association (NFPA) 1 standards for access and egress. All building exterior exit doors will be within 150 ft of the driveway.

The plans for the property are not expected to require off-site water system improvements for fire suppression.

3.9.2 Wastewater

Existing Conditions

Based on record drawings, there are two existing cesspools that were filled when the property was redeveloped in 1983. City records show that there is an existing 6-inch lateral for the property that connects to an 18-inch sewer main in Kāhala Avenue. The lateral follows the driveway into the property. The sewer main and the lateral are both made of vitrified clay pipe material. A sewer manhole is located west of the parcel on Kāhala Avenue and 'Elepaio Street.

Anticipated Impacts and Proposed Mitigation

Projected average wastewater flow for the property is estimated at 490 GPD. The on-site sewer distribution system will consist of an existing gravity-flow 6-inch sewer lateral collecting flows from the residences. The existing sewer line is in good condition and will continue to be used as the sewer line for the new homes. Installation of a new underground sewer line and trenching will not be required. Sewer system components will comply with the Wastewater System Design Standards of the City and County of Honolulu, Department of Environmental Services Volume 1, July 2017.

Future wastewater improvements for the property must comply with Department of Health Administrative Rules, Title 11, Chapter 23. The City sewer system has adequate capacity to serve the planned residential use with no requirements for off-site improvements.

3.9.3 Storm Drainage

Existing Conditions

There is no City storm drain located at the frontage of the property. Storm water generated during heavy rainfall generally percolates into the ground on this level property with sandy soils. Overland flows generally remain within the property with no off-site discharge. Elevation ranges from 9.8'± at the roadway to 7.5'± at the makai end of the property.

Anticipated Impacts and Proposed Mitigation

A shallow turfed drainage swale will extend parallel to the northeast boundary (Koko Head side) of the property to allow overland flows to disperse and infiltrate along the length of the bioswale. Most importantly, the 'footprint' of non-permeable surfaces will be small as a percentage of the overall property plan. Pervious pavements and landscaped areas will be used to increase on-site infiltration, and to reduce stormwater runoff. The large grassy areas will be fine-graded to allow natural infiltration in most landscape areas; only in especially heavy rain would water flow from these retention areas into the bioswale.

Due to the high permeability of the sandy soils on the property, very little runoff is anticipated during normal rainfall events. Shallow retention basins or similar infiltration BMPs will collect roof downspout discharges. These measures will naturally filter property runoff and will buffer storm runoff flows from the property. All property drainage designs will comply with current Department of Planning and Permitting standards.

A Residential Storm Water Management Plan (RSWMP) which implements Best Management Practices will be provided. The RSWMP is a new requirement applicable to Single Family or Two-Family dwelling Building Permit projects effective August 18, 2020. Since this is not a Priority project as categorized by the City's Water Quality Rules, Low Impact Development (LID) Property Design Strategies and Source Control Best Management Practices (BMPs) will be implemented to the Maximum Extent Practicable.

Minor grading will occur crossing the center of the property and dropping off on both sides, with two general drainage areas along the eastern and western edges of the property. The middle pathway to the entry will be high and dry.

Landscaping will be established across the makai end of the property to provide natural filtration of runoff. The Civil Engineering Branch of the City and County of Honolulu Department of Planning and Permitting will review and approve the property grading, drainage, and erosion control plans before construction commences.

During the construction period, erosion will be minimized through compliance with the City and County's grading ordinance and the applicable provisions of the DOH's Water Quality Standards (Title 11, Chapter 54, HAR) and Water Pollution Control requirements (Title 11, Chapter 55, HAR). Additionally, standard BMPs will be employed to minimize impacts, as detailed in subsequent construction plans.

Infiltrative BMPs and sustainable design strategies will be used to retain the stormwater generated by the 10-year 1-hour design storm event, including the expected slight increase in runoff quantities over existing conditions. Although the residential use is not required to implement stormwater quality BMPs in accordance with the City and County's Rules Relating to Storm Drainage Standards, it is the goal to reduce the pollution associated with stormwater runoff from development. Infiltrative BMPs that may be used on-site for retention and stormwater quality facilities are described in detail below:

- Pervious Pavements (Paver System) - Pervious pavers collect stormwater runoff through the compacted sand joints in the paver system. Runoff infiltrates through the joints and into a gravel layer under the pavement, where runoff can be stored and infiltrated instead of being conveyed to the public storm drain system. Pollutants and sediment are removed from runoff as it infiltrates through the sand and gravel layers.
- Enhanced Swale (Bio retention Swale/Dry Swale) - An enhanced swale is a shallow, linear channel with planting beds covered with turf or other surface material, other than mulch or plants. Biofiltration swales rely on surface flow of runoff along the planted swale during which pollutants are removed, in lieu of infiltration through media (mulch/sandy soil) and tend to contain simple vegetation.

Implementation of these measures will mitigate increases in runoff and help to reduce runoff quantities entering Kāhala Avenue. The BMPs will also improve water quality as pollutants and sediments are retained and treated on-site instead of being discharged off site. The BMPs will have overflow systems to bypass runoff volumes and flows from larger storm events. With the inclusion of BMPs and LID techniques, no significant stormwater impacts are anticipated.

3.9.4 Solid Waste Disposal

Existing Conditions

The property is currently vacant, therefore no solid waste is produced as this time.

Anticipated Impacts and Proposed Mitigation

Solid waste from the residence will be collected curbside by the City and County of Honolulu Refuse Division. Construction-generated solid waste will be disposed of at an approved City and County of Honolulu refuse facility.

3.9.5 Electrical and Communications

Existing Conditions

The property is currently served by overhead power lines along Kāhala Avenue and overhead telecommunication lines by various providers. An existing utility pole is situated across the property, on the mauka side of Kāhala Avenue. Electrical service for residential properties in the Kāhala area is provided by Hawaiian Electric Company (HECO), and service provided will be greater than 200 AMP. Spectrum and Hawaiian Telcom provide telephone, cable and internet service. These service providers will be consulted by the design team to coordinate service to the property.

Anticipated Impacts and Proposed Mitigation

The residential use will add demand for electrical and communication services. Service capacity to the Kāhala Avenue area for electrical and communications are anticipated to be adequate, to be verified with HECO and telcom companies. Electrical and communications service will be designed with the providers and an electrical engineer. Existing electrical infrastructure will remain in place and brought up to the surface, mounting conduits on the lower section of the 'ewa CMU wall. There will be no new utility lines installed underground.

Off-site improvements required to provide the additional services will be the responsibility of each service provider, respectively. Required connections to the service systems will be coordinated with the respective service providers. No significant impact is anticipated.

3.9.6 Roadways and Traffic Conditions

Existing Conditions

Kāhala Avenue extends parallel to the coastline in the east-west direction, serving the majority of beach front houses from Lē'ahi to the Wai'ālae Country Club in Kāhala. An existing driveway provides access to the property off Kāhala Avenue. The two-lane roadway is under the jurisdiction of, and maintained by, the City and County of Honolulu.

The existing 60-foot right-of-way consists of 15-foot wide grassed shoulders and concrete and/or rock curbs. The posted speed limit is 25 miles per hour (mph) in both directions. The roadway is primarily used for residential traffic and provides access to the Wai'ālae Country Club and the Kāhala Hotel & Resort located at the east end of Kāhala Avenue.

Traffic associated with the Kāhala area is generally light, except for annual events such as the Honolulu Marathon and Sony Open golf tournament. Traffic flow along Kāhala Avenue is nearly always uninterrupted. The intersection of 'Elepaio Street and Kāhala Avenue is stop sign controlled on the 'Elepaio Street leg.

Discussions with the DPP Traffic Review Branch (TRB) confirmed that there are no future plans to widen Kāhala Avenue beyond the existing right-of-way. Although there are no future plans for frontage improvements, such as sidewalks and additional landscaping, the City reserves future rights to potentially utilize the existing 15-foot grassed shoulder.

Vehicular access to the property will be from one existing driveway off Kāhala Avenue. The driveway leads directly to a parking area and the garage.

Anticipated Impacts and Proposed Mitigation

The existing access to the property off Kāhala Avenue will be maintained. The driveway will provide access to the parking area and garage.

Low Impact Development design strategies are planned. Permeable pavements, such as pavers or grasscrete products may be used for the driveway surfaces. This type of pavement increases stormwater infiltration and percolation while providing a more aesthetic enhancement as compared to typical concrete or asphalt pavements. This action will reduce runoff from the property and promote infiltration which mimics the existing drainage patterns, reduces runoff and pollutants/sediment entering the Kāhala Street frontage and oceanfront area.

An 8-foot wide setback for a potential future widening of Kāhala Ave exists along the street frontage of the parcel, although there are no County plans to advance this in the foreseeable future. The planned residential use will not affect the road widening setback, and adverse effects on roadway systems are not anticipated.

The traffic associated with the residential use at the property is anticipated to be typical of the residences in the area. The traffic from this home will be negligible and not affect the operations along Kāhala Avenue.

3.10 Air Quality

Existing Conditions

The U.S. Environmental Protection Agency (EPA) established the National Ambient Air Quality Standards (NAAQS) per the requirements of the Clean Air Act (last amended in 1990) to protect public health and welfare and prevent the significant deterioration of air quality. These standards account for seven major air pollutants: carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O₃), particulate matter smaller than 10 microns (PM₁₀), particulate matter smaller than 2.5 microns (PM_{2.5}), sulfur oxides (SO_x), and lead. DOH Clean Air Branch (CAB) has also established State Ambient Air Quality Standards (SAAQS) for six of these air pollutants to regulate air quality statewide. The SAAQS for carbon monoxide and nitrogen dioxide are more stringent than NAAQS. Hawai'i also has a stringent standard for hydrogen sulfide, which is a common odorous pollutant associated with wastewater treatment facilities.

DOH CAB regularly samples ambient air quality at monitoring stations throughout the State and annually publishes this information. On O'ahu, there are six monitoring stations. The DOH Air Monitoring Station closest to the property is located in downtown Honolulu on the roof of the DOH building (Kinau Hale) at 1250 Punchbowl Street, which monitors CO, SO₂, PM_{2.5} and PM₁₀.

In Hawai'i, both Federal and State environmental health standards pertaining to outdoor air quality are generally met due to prevalent trade winds and the absence of major stationary sources of pollutant emissions. Present air quality in the property area is mostly affected by motor vehicles, with carbon monoxide being the most abundant of the pollutants emitted. Carbon monoxide is a colorless, odorless, tasteless gas under atmospheric conditions and is produced by the incomplete combustion of carbon fuel.

The State and Federal standards for carbon monoxide are set at 9 parts per million (ppm) and 35 ppm in one hour, respectively. The closest monitoring station on Punchbowl Street shows that the concentrations of carbon monoxide are below the State (9 ppm) and Federal (35 ppm) standards with an annual mean of 0.4 ppm (DOH 2021).

Anticipated Impacts and Proposed Mitigation

There will be two types of short-term air quality effects that will result from construction of the residences. These effects include: fugitive dust generation and on-site/off-site emissions from moving construction equipment and commuting construction workers. The construction activities are anticipated to be in compliance with State Ambient Air Quality Standards. Strict compliance with State and County pollution control requirements, such as dust-watering programs and covering dirt-hauling trucks, will mitigate fugitive dust from construction activities. On-site and off-site emissions from construction equipment and workers can be controlled through the use of properly maintained equipment and standard construction site management practices. The residential use will have no significant long term air quality effects.

3.11 Noise

Existing Conditions

HAR §11-160 defines maximum permissible sound levels which are intended to protect, control, and abate noise pollution from stationary sources and construction, industrial, and agricultural equipment. As detailed below, maximum permissible sound levels in various zoning districts are set for excessive noise sources during the day (7 a.m. to 10 p.m.) and night (10 p.m. to 7 a.m.) at the property line where the activity occurs.

- Class A – Residential, conservation, preservation, public space, open space, or similar type zones – 55 decibel (dBA) (day) and 45 dBA (night)
- Class B – Multi-family dwellings, apartment, business, commercial, hotel, resort, or similar type zones – 60 dBa (day) and 50 dBa (night)
- Class C – Agriculture, country, industrial, or similar type zones – 70 dBa (day) and 70 dBA (night)

The primary source of existing noise levels at the property occurs from the traffic along Kāhala Avenue. The Kāhala area is generally a quiet residential area. The ambient noise levels at the subject parcel are typical of noise levels found in urbanized residential areas.

Anticipated Impacts and Proposed Mitigation

In the long-term, the residential use of the property will not result in an increase in ambient noise levels in the area. Significant amounts of noise may, however, be generated during the short-term construction period and may impact existing residents in the neighborhood. Construction activities will be monitored by the State to comply with the provisions of the regulations for community noise control. The contractor will obtain a noise permit if the noise levels from construction activities are expected to exceed the allowable levels. Mobilization of heavy vehicles to and from the property will also comply with the State's administrative rules for vehicular noise control.

Construction noise at the proposed location is not expected to be significant. Construction operations must comply with State DOH regulations and the City Noise Ordinance, which limits construction operations and resultant noise to daytime hours and specific maximum levels.

3.12 Public Facilities and Services

This section discusses the potential effects to public facilities and services at the property and surrounding area.

Educational Facilities

Kapi'olani Community College, part of the University of Hawai'i System, is located west of the subject parcel. A number of other public and private elementary, middle, and high schools are also located throughout the neighboring communities. The closest schools to the property include:

- Variety School of Hawai'i is located at 710 Palekaua Street and is approximately 0.9 miles away from the property.
- Kaimukī Middle School is located at 631 18th Avenue, and is approximately 1.3 miles away from the property.
- Kāhala Elementary School, located at 4559 Kīlauea Avenue and is approximately 1.1 miles away from the property.

The residential action will have no effects to existing educational facilities.

Recreational Facilities

Public beach parks provide open space and a natural outdoor environment for both residents of Hawai'i and tourists to enjoy. The public parks located nearest to the residence are Wai'ālae Beach (1.0 miles) and Kuilei Cliffs Beach Park (1.2 miles). These public recreational facilities will not be affected by the residential improvements.

Medical Facilities

Numerous major hospitals and clinics are located in relative proximity to the residential property. The nearest emergency hospital is Kapi'olani Medical Center, located approximately 5.2 miles from the property taking an average response time of 15 to 20 minutes. The residential use will not impact the handling of emergency medical services. The area hospitals will continue to function at their present locations and will be accessible to the medical emergencies in the area. No mitigation is proposed.

Police Services

The property is located in District 7 of the Honolulu Police Department (HPD) which encompasses approximately 40 square miles in east Honolulu, from Punahou Street to Makapu'u Point. With the exclusion of Waikīkī, the area includes Mānoa, McCully, Mō'ili'ili, Kaimukī, Pālolo, Lē'ahi (Diamond Head), Wai'alae, Kāhala, 'Āina Haina, Kuli'ou'ou, Hawai'i Kai, Kalama Valley, and Sandy Beach.

East Honolulu has one HPD Substation and a Burglary Theft Detail office located within the District. A walk-in/store front Substation is located in the Hawai'i Kai Towne Center at 6600 Kalaniana'ole Highway. The Substation is around the 'ewa corner of the Hawai'i Kai Satellite City Hall office. The District's Burglary Theft Detail is located in the Lē'ahi area at 4087 Diamond Head Road. The Main Office for District 7 is served from the main police station at 801 Beretania Street.

The residential use will not affect HPD's operations or ability to provide adequate protection services to the surrounding community.

Fire Services

Primary fire protection to the area is provided by the Honolulu Fire Department (HFD). The closest HFD fire stations are located in both Kaimukī and Waikīkī.

- Station 5 in Kaimukī is located at 971 Koko Head Avenue and is approximately 1.9 miles away from the property.
- Station 7 in Waikīkī is located at 381 Kapahulu Avenue and is approximately 2.6 miles away from the property.

The residential use is not expected to affect HFD's operations or ability to provide fire protection services to the property and surrounding areas. The planned residence will be designed to meet fire and building code requirements. Appropriate design plans will also be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department for their review.

3.13 Potential Cumulative and Secondary Impacts

Cumulative effects are impacts which result from the incremental effects of an activity when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. The proposed action is consistent with applicable development plans and policies. The applicant will seek a Special Management Area permit and will adhere to the applicable terms and conditions of approval tied to this permit.

The property at 4439 Kāhala has been part of the Kāhala neighborhood subdivision since the early 1920's. The first home was built in 1940. Records show that the property's seawall was repaired under a City permit approval in May 1946 due to the April 1, 1946 tsunami. Since then, homes have been torn down and rebuilt approximately every 30 to 40 years. The most recent dwellings on the property were demolished in the year 2009, and the property is now being prepared for a new residence.

Guidance issued by the Mayor's Directive 18-2 recommends that an appropriate planning target to use in the design of future projects would be 3.2 ft sea level rise exposure area (SLR-XA) by mid-century. Situated on the coast, the property is potentially subject to the combined effects of SLR, flooding, storm surge, wave action, and shoreline erosion. Fortunately, the Kāhala coastline has a shallow reef which refracts and dissipates some of the wave energy traveling toward the shore, protecting the property

from potential storm surge and wave action. The existing 8.0 ft seawall will defend the property from shoreline erosion and SLR. Additional design of the property is important when planning for SLR and flooding. Existing utilities will be re-connected to the new facility (sewer system) while others will be brought above ground, the buildings will be built at a distance more than 60 ft from the certified shoreline, and will be elevated to FFE=9.5. Appropriate drainage swales and the composition of the Beaches (BS) soil makeup will reduce the chances for flooding.

Construction activities will generate direct employment in construction-related industries and increase government revenues. The residential use will be consistent with the Kāhala neighborhood by redeveloping the property with a new home. Kāhala is a mature residential neighborhood which includes a mix of older homes as well as newer homes that have been rebuilt over time. This is consistent with other longstanding residential neighborhoods on O‘ahu. The rebuilding process in Kāhala has been gradual and ongoing for decades, with no significant adverse cumulative environmental impacts to the surrounding neighborhood. The subject property was previously in residential use and the new home will be consistent with design character and scale consistent with the surrounding neighborhood. The residential use is not anticipated to result in significant adverse environmental impacts, nor contribute to adverse cumulative environmental impacts.

The approval will not have substantial secondary impacts, such as population changes or effects on public facilities.

Chapter 4

Alternatives

Chapter 4

Alternatives

The following provides a discussion of alternatives to the proposed action as described in *Section 2.0*.

4.1 Alternative A – No-Action Alternative

The No-Action Alternative is the baseline against which all other alternatives are measured. “No-Action” refers to the future site conditions that would likely result should the proposed action not proceed. The No-Action Alternative would keep the site unused without redevelopment for residential structures, with no change to the property.

The existing environmental conditions at the property would remain unchanged and the anticipated improvements to the subject parcel would be foregone. There would be no short-term construction related impacts, such as soil disturbance and construction noise. The long-term environmental conditions would be commensurate with an undeveloped vacant property.

There would be no development-related impacts under the No-Action Alternative. This alternative would result in total non-utilization of the site for its permitted use, under the existing R-7.5 zoning. With the No-Action scenario, at some point in the future another entity could acquire the property from the current owners and pursue full development.

Under the No-Action Alternative, the vacant property would not achieve the redevelopment objectives for residential use as outlined in *Section 2.0*. The intent behind the owner’s acquisition of this land was for future redevelopment for a quality single-family residential use. Leaving the property vacant would continue to expose the land to trespassing and vandalism, and future speculation. The no action alternative would require the owners to continue to pay Real Property Taxes to the City without the ability to benefit from the property as zoned for residential use. The No-Action Alternative would not be a practical approach for the future of this land.

4.2 Alternative B – Four Detached Single-Family Residences

The redevelopment of the property with four detached single-family homes was considered as an alternative action. Each of these homes could be built with a total floor area in excess of 7,500 sf, which would require the preparation of an EA and approval of an SMA Use Permit (Major).

This alternative development scenario would be pursued under as-of-right zoning to developing the property. Under the existing R-7.5 Residential zoning district and LUO provisions (see §21-8.20A Multiple Homes on Lot), with a parcel land area of 35,428 sf, a maximum of 4.72 single family dwellings could potentially be developed on this property. The four homes would be developed as a condominium property regime (CPR) enabling individual sale to as many as four different parties. There would be a consistent design theme for the multiple unit project to create consistency of quality and character. The multiple residence development plan approach would build two homes fronting the shoreline, and two homes fronting Kāhala Avenue, served by a common driveway. The four-home plan

could include a landscaped open space common element, or the individual home sites could be maintained individually as private elements.

Although the owners acknowledge the right to pursue a multiple home development on this property under existing zoning, this is not their intention for the future use and enjoyment of this property for their family. Compared to the proposed action, the four-residence alternative would negatively affect views of the property from public locations. There would be four residential structures built on the property versus one residence and guest cottage. In addition, due to the scale of site development, two of the buildings would be visible from Kāhala Avenue and two would be visible from shoreline locations.

4.3 Alternative C – Located Outside of the 3.2 ft SLR-XA

Another alternative would consider an extreme mauka position for the residential structure, to locate all structures outside areas which may experience chronic high tide flooding in the long-term model prediction (1 m; 3.2 SLR-XA) of global mean sea level rise (GMSL). Mayor's Directive 18-2 provides guidance to the County for the upper range prediction as a planning recommendation. The SLR-XA 0.5 ft model projection mapping (PacIOOS, 2021) for this location shows inland reach to 40 ft from the shoreline (wall), The SLR-XA 1.1 ft exposure projection could extend about 50 to 60 ft inland. This is the current predictive level for mid-century by climate scientists. The predictive extent in the generalized mapping generated in the more extreme SLR-XA 2.0 ft and SLR-XA 3.2 ft models shows some overlap with the current planned location for the home, without considering the future building pad elevation.

The planned architectural design for the new home of a retired kama'āiana family is consistent with classic Kahala character single-story pitched roof lines, with generous setbacks, ample landscaping and very limited public view impact along Kahala Avenue. This alternative would force the development of the residence, guest cottage and garage outside of the 3.2 SLR-XA, which would create a very congested building environment and living spaces. The restrictive building site limitation would force the construction of a two-story home and two-story garage with live-above guest quarters positioned at the mauka half of this Kahala beachfront property. This alternative would completely change the character of the planned residential structures and landscape, making it very congested with requiring structures built to the maximum 25 ft height limit. This alternative would result in a heavily developed character in public view, and a development approach for the property which would not be beneficial the Kāhala community or the owners.

The SLR-XA model projection across the Kahala shoreline properties is not precise to the individual site conditions, and does not account for the effectiveness of existing shoreline protection and future site grades. There are several measures taken with the 4439 Kāhala property which will accommodate for rising sea level over many decades ahead, well beyond the mid-century 2050 horizon (30 years from now). First, the top of the existing seawall is approximately 8.0 ft above current sea level, which will strictly limit the incursion of rising sea level and potential threats to the residential structure. Second, the new residence will be set back over 60 ft from the shoreline, well beyond initial phase projections of SLR without accounting for mitigating factors of shoreline condition and grades. This setback distance is already 50% greater than the required 40 ft shoreline setback. Third, the levelled pad for the homesite and concrete slab will set at a base elevation of 9.5 ft (another 1.0 ft above the existing grade). For these reasons, the alternative for siting the home outside the 3.2 SLR-XA prediction would be highly discouraged, and would generate adverse effects to the Kahala community.

4.4 Alternative D – Alternative Site

The 0.813-acre site is surrounded by residential zoned lands to the east, west, and north, and by the Pacific Ocean to the south. There are very few comparably sized large residential zoned shoreline parcels available in Kāhala. The 0.813-acre site is ideal to support the physical requirements of the single-family residence on this property. Other residential properties in the area are currently occupied, too large, most are not for sale and few are available for redevelopment. The site was also chosen because it has access to the existing utilities and to ensure compliance with environmental regulations.

The owners could seek another community with shoreline properties in the East Honolulu, windward, North Shore or Waianae coast. However, the owners are long-time kama'aina residents of the Kāhala community and purposefully selected this site for their future residence. The property is an exact fit for the objectives and needs of the residential homes. For that reason, the property was intentionally purchased by 4439 Kahala LLC for residential redevelopment purposes. While another residential property could have been selected for the development of the homes, the subject property represents an ideal fit for the owner's objectives and overall needs.

The Alternative Site option was evaluated and found to be impractical.

Plans and Policies

Chapter 5

Plans and Policies

The consistency of the planned redevelopment at 4439 Kāhala with applicable State of Hawai'i and City and County of Honolulu planning and land use objectives, policies, principles and guidelines are discussed below.

5.1 Hawai'i State Land Use District Guidelines

The State of Hawai'i Land Use Law regulates the classification and uses of lands in the State to accommodate growth and development, and to retain the natural resources in the area. All State lands are classified by the State Land Use Commission, as Urban, Rural, Agricultural, or Conservation, with consideration given to the General Plan of the County.

Discussion: The location of the proposed action includes lands that are designated Urban District. The Hawai'i Revised Statutes (HRS) §205-2(b) states that:

“Urban districts shall include activities or uses as provided by ordinances or regulations of the county within which the urban district is situated.”

The proposed action is consistent with this statute, as the proposed land uses are consistent with City and County of Honolulu Land Use Ordinance, General Plan, and Primary Urban Center Development Plan, as discussed below.

5.2 Hawai'i State Plan

The Hawai'i State Plan (HRS §226) establishes a statewide planning system that provides goals, objectives, and policies that detail priority directions and concerns of the State of Hawai'i. It is the goal of the State, under the Hawai'i State Planning Act, to achieve the following:

- A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawai'i present and future generations.
- A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.
- Physical, social, and economic well-being, for individuals and families in Hawai'i, that nourishes a sense of community responsibility, of caring, and of participation in community life.

Specific objectives and policies of the State Plan that pertain to the planned improvements are as follows:

Section 226-11 Objectives and policies for the physical environment – land-based, shoreline, and marine resources:

- (a) *Planning for the State’s physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:*
 - (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.*
 - (2) *Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.*
 - (3) *Take into account the physical attributes of areas when planning and designing activities and facilities.*
 - (4) *Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.*
 - (6) *Encourage the protection of rare or endangered plant and animal species and habitats native to Hawai‘i.*
 - (8) *Pursue compatible relationships among activities, facilities, and natural resources.*

Discussion: The planned use is a balanced residential redevelopment of an existing lot that is compatible to existing uses and relationships between the built environment and nearby shoreline. Best management practices will ensure that marine and nearshore habitats will be protected during the residential construction and operations.

Section 226-12 Objectives 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.*
 - (3) *Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.*
 - (5) *Encourage the design of developments and activities that complement the natural beauty of the islands.*

Discussion: The residential use is designed to complement the natural beauty of the surrounding area. Existing views and vistas will not be adversely affected. The scale and size of the action are appropriate for the site to meet the design controls established in the Land Use Ordinance (LUO). The residential structures will not exceed 25 feet in height and will not interfere with existing prominent public vantage points from which the public enjoys significant public views of Diamond Head and the ocean. Therefore, the proposed action will not affect scenic resources. Perimeter landscaping on the site will serve as a visual buffer to surrounding residential areas.

Historic resources have been documented in an Archaeological Assessment (Keala Pono, 2021) conducted for the site. The study found no evidence of archaeological remains. The site area has undergone extensive disturbance from previous development and does not possess culturally significant resources. Archaeological monitoring is planned during construction.

Section 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.*
- (b) *To achieve the land, air, and water quality objectives, it shall be the policy of this State to:*
 - (2) *Promote the proper management of Hawai’i’s land and water resources.*
 - (3) *Promote effective measures to achieve desired quality in Hawai’i’s surface, ground and coastal waters.*
 - (4) *Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai’i’s people.*
 - (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.*
 - (6) *Encourage design and construction practices that enhance the physical qualities of Hawai’i’s communities.*

Discussion: The residential use is designed to fit appropriately within the surrounding environment. The acoustic environment and surrounding air quality may experience small effects during construction. Best management practices and regulatory controls will ensure air quality levels are within acceptable regulatory limits. The site is located within the tsunami evacuation zone and within the FEMA Flood Zones X and VE. Design controls will plan the development to meet regulatory requirements.

Section 226-15 Objectives and policies for facility systems – solid and liquid wastes.

- (a) *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 for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.*
- (b) *To achieve solid and liquid waste objectives, it shall be the policy of this State to:*
 - (2) *Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.*

Discussion: Solid waste and wastewater disposal systems for the residential use will be designed to minimize effects on existing solid and liquid waste facilities. The owners will participate with the City and County of Honolulu’s residential recycling program to minimize solid waste.

Section 226-16 Objectives and policies for facility systems – water.

- (b) *To achieve the facility systems water objective, it shall be the policy of this State to:*
 - (1) *Coordinate development of land use activities with existing and potential water supply.*

Discussion: The BWS has determined that its existing water system is adequate to accommodate and supply the anticipated water demand.

Section 226-108 Sustainability guidelines.

(b) Encouraging planning that respects and promotes living within the natural resources and limits of the State;

Discussion: During the planning of sustainability, guidelines are considered and evaluated as part of the residential design and environmental review process. The residential use will fit with the existing character of the surrounding Kāhala residences and will not adversely affect existing natural resources.

5.3 Hawai'i Coastal Zone Management Program

The Coastal Zone Management Act of 1972 (16 USC Section 1451), as amended through Public Law 104-150, created the coastal management program and the National Estuarine Research Reserve system. The coastal states are authorized to develop and implement a state coastal zone management program. The Hawai'i Coastal Zone Management (CZM) Program received federal approval in the late 1970's (HRS §205A-2). The objectives of the State's CZM Program are to protect valuable and vulnerable coastal resources such as coastal ecosystems, special scenic and cultural values and recreational opportunities. The objectives of the program are also to reduce coastal hazards and to improve the review process for activities proposed within the coastal zone. Pursuant to HRS §205A-1, "Coastal hazards" means any tsunami, hurricane, wind, wave, storm surges, high tide, flooding, erosion, sea level rise, subsidence, or point and nonpoint source pollution.

Each county is responsible for designating an SMA that extends inland from the shoreline. Development within the SMA is subject to County approval to ensure the proposal is consistent with the policies and objectives of the Hawai'i CZM Program. The residential site is within the SMA as delineated by the City and as such, requires an additional review under State CZM and County SMA rules. The following subsections examine the objectives of the Hawai'i CZM Program and the impacts of the planned improvements relative to the State CZM objectives and policies. Specific City SMA policies are also discussed in *Section 5.6*.

RECREATIONAL RESOURCES

Objective: Provide coastal recreational opportunities accessible to the public.

- (A) Improve coordination and funding of coastal recreation planning and management.*
- (B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:*
- *Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;*
 - *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 monetary compensation to the State for recreation when restoration is not feasible or desirable;*
 - *Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;*

- *Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;*
- *Encouraging expanded public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value;*
- *Adopting water quality standards and regulating point and non-point sources of pollution to protect and where feasible, restore the recreational value of coastal waters;*
- *Developing new shoreline recreational opportunities, where appropriate, including but not limited to artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and*
- *Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use Commissions, board of land and natural resources, county planning commissions, and crediting such dedication against the requirements of Section 46-6.*

Discussion: The proposed action would have no effect on coastal resources which would require coordination and funding of coastal recreation planning and management. The residential development will not have an effect on recreational activities, impede public access, or require restoration of coastal resources. The residential use will comply with State CZM guidelines and will not affect public coastal recreational opportunities.

The residential use will be constructed and maintained in accordance with State and Federal water quality regulations. Storm water and sewer management systems will be maintained, and new infrastructure will be constructed to meet applicable standards. The City sewer systems have adequate capacity to address the anticipated wastewater demand. There are no septic tanks, leach fields, or injection wells proposed. There will be no discharge points into coastal waters.

HISTORIC RESOURCES

Objective: Protect, preserve and, where desirable, restore those natural and man-made historic and pre-historic resources in the coastal zone management area that are significant in Hawai'i and American history and culture.

- (A) *Identify and analyze significant archaeological resources;*
- (B) *Maximize information retention through preservation of remains and artifacts or salvage operations; and*
- (C) *Support state goals for protection, restoration, interpretation and display of historic resources.*

Discussion: An Archaeological Assessment Report (Keala Pono, 2021) was completed to assess the potential for locating archaeological resources at this site. The study did not identify evidence of archaeological remains at the site. The site area has undergone extensive disturbances from previous development. Consistent with the archeological investigation, it was determined the site does not possess culturally-significant resources. The report recommends archaeological monitoring during construction.

SCENIC AND OPEN SPACE RESOURCES

Objective: Protect, preserve and where desirable, restore or improve the quality of coastal scenic and open space resources.

- (A) *Identify valued scenic resources in the coastal zone management area;*
- (B) *Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;*

- (C) *Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and*
- (D) *Encourage those developments which are not coastal dependent to locate in inland areas.*

Discussion: As described in Section 3.8, the residential redevelopment will not affect vistas or scenic resources. The proposed action is consistent with the County General Plan, Primary Urban Center Development Plan, and zoning regulations. The residential use will blend into the surrounding urban residential neighborhood. The scale and size of the action are appropriate to the site and meet the design controls established in the LUO. The residences will not exceed 25 feet in height and will not interfere with existing prominent public vantage points from which the public enjoys significant public views of Diamond Head and the ocean. Therefore, the proposed action will not adversely affect scenic resources. Perimeter landscaping on the site will serve as a visual buffer to surrounding residential areas.

COASTAL ECOSYSTEMS

Objective: Protect valuable coastal ecosystems, including coral reefs, beaches, and coastal dunes, from disruption and minimize adverse impacts on all coastal ecosystems.

- (A) *Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;*
- (B) *Improve the technical basis for natural resource management;*
- (C) *Preserve valuable coastal ecosystems, including coral reefs, beaches, and coastal dunes, of significant biological or economic importance;*
- (D) *Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and*
- (E) *Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards.*

Discussion: The action will not affect coastal ecosystems or natural resource management. During construction and operation, stormwater will be retained onsite. Infiltrative BMPs will be used to reduce pollution associated with stormwater runoff generated by the 10-year 1-hour duration design storm event. Operations of the residence will comply with State and Federal water quality standards.

ECONOMIC USES

Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

- (A) *Concentrate coastal dependent development in appropriate areas;*
- (B) *Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are planned, designed, and constructed to reduce exposure to coastal hazards, and minimize adverse social, visual, and environmental impacts in the coastal zone management area; and*
- (C) *Direct the location and expansion of coastal development to areas designated and used for those developments and permit reasonable long-term growth at those areas, and permit coastal development outside of designated areas when:*
 - (i) *Use of presently designated locations is not feasible;*
 - (ii) *Adverse environmental effects and risks from coastal hazards are minimized; and*
 - (iii) *The development is important to the State's economy.*

Discussion: The proposed residence is consistent with State and County plans and land regulations and will not result in adverse social, visual, and environmental impacts in the CZM area. Risks associated with coastal hazards such as tsunami, hurricane, wind, wave, storm surges, high tide, flooding, erosion, sea level rise, subsidence, or point and nonpoint source pollution are being mitigated by retreating the residence further mauka than the required 40 ft shoreline setback, and elevating the property by a foot to FFE=9.5. The residential development is in an area presently designated for such land use.

COASTAL HAZARDS

Objective: Reduce hazard to life and property from coastal hazards.

- (A) *Develop and communicate adequate information about risks of coastal hazards;*
- (B) *Control development in areas subject to coastal hazards;*
- (C) *Ensure that developments comply with requirements of the National Flood Insurance Program; and*
- (D) *Prevent coastal flooding from inland projects.*

Discussion: As previously discussed, pursuant to HRS §205A-1, “Coastal hazards” means any tsunami, hurricane, wind, wave, storm surges, high tide, flooding, erosion, sea level rise, subsidence, or point and nonpoint source pollution. Adequate information about the risks of coastal hazards to the property have been developed and are discussed in *Section 3.4 Natural and Manmade Hazards*. Guidance issued by the Mayor’s Directive 18-2 recommends that an appropriate planning target to use in the design of future projects would be 3.2 ft sea level rise exposure area (SLR-XA) by mid-century.

The site is within FIRM Zones X and VE, and is also located within the tsunami evacuation zone (*Figure 1.6*). The site for residential development is located within Zone X and is therefore not subject to development standards within the Special Flood Hazard Area. The action is a redevelopment of an existing residential lot and will not increase the potential hazard risk associated with flooding, landslides, erosion, siltation or earthquake. Even under the 3.2 ft sea level rise planning target, the residential property is protected by an 8.0 ft seawall, will be built at a distance more than 60 ft from the certified shoreline, and will be elevated to FFE=9.5. These measures will help to protect the home from high tide, coastal flooding, erosion, and sea level rise.

Construction work will be performed in accordance with the State and County-approved design standards. To prevent ponding or localized flooding resulting from storm run-off, existing drainage infrastructure will be maintained. New site infrastructure will be designed and constructed to meet applicable standards. No significant adverse effects from wind or subsidence are anticipated.

MANAGING DEVELOPMENT

Objective: Improve the development review process, communication, and public participation in the management of coastal resources and planning for coastal hazards.

- (A) *Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;*
- (B) *Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and*
- (C) *Communicate the potential short- and long-term impacts of proposed significant coastal developments early in their life-cycle and in terms understandable to the public to facilitate public participation in the planning and review process.*

Discussion: This EA discloses the potential short-term and long-term impacts of the action on the environment. Procedurally, this EA is completed in support of ROH Chapter 25 SMA Permit request, and the EA conforms to requirements for content and procedures under HRS Chapter 343. The Office of Environmental Quality Control (OEQC) publishes notice of the EA availability for public review. The public is allowed 30 days to submit comments on the EA. During early consultation and the Draft EA 30-day comment period, agencies and organizations were consulted.

PUBLIC PARTICIPATION

Objective: Stimulate public awareness, education, and participation in coastal management.

- (A) Promote public involvement in coastal zone management processes;*
- (B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and*
- (C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.*

Discussion: Public participation is part of the ROH Chapter 25/HRS Chapter 343 environmental review process. The Office of Environmental Quality Control (OEQC) publishes notice of the EA availability for public review. The public is allowed 30-days to submit comments on the EA. Information regarding the coastal issues and processes is publicly provided in the EA, along with proposed mitigation measures addressing any coastal concerns. Consulted parties in the environmental process are encouraged to provide comments regarding the proposed action during the Draft EA public review period. Comments submitted through the public review process, and the responses they generate, are all included within the Final EA that is publicly available through the OEQC.

BEACH PROTECTION

Objective: Protect beaches and coastal dunes for (i) Public use and recreation; (ii) Benefits of coastal ecosystems; and (iii) Natural buffers to coastal hazards.

- (A) Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion;*
- (B) Prohibit construction of private shoreline hardening structures such as seawalls and revetments, except at sites where they will not adversely affect the beach, beach processes, or public beach access, or interfere with existing recreational and waterline activities;*
- (C) Minimize the construction of public erosion-protection structures seaward of the shoreline;*
- (D) Minimize grading of and damage to coastal dunes;*
- (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*
- (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.*

Discussion: The property is located near the shoreline. However, no structures will be located near the shoreline area and will be setback according to applicable City development standards to mitigate the effects of storm surge, high tide, wave action, and sea level rise. There will be no construction of erosion-protection structures. The action will not affect public use and recreation of beaches near the site. Vegetation on the property will be maintained to prevent encroachment on the public beach area.

MARINE AND COASTAL RESOURCES

Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

- (A) *Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;*
- (B) *Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;*
- (C) *Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;*
- (D) *Promote research, study, and understanding of ocean processes, 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 ocean development activities relate to and impact upon ocean and coastal resources; and*
- (E) *Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.*

Discussion: The planned residential use will not adversely affect marine and coastal resources. The new home will be setback according to City development standards and will not affect the shoreline area. The residential project does not promote research and understanding particular to ocean development activities and effects upon ocean and coastal resources.

5.4 City and County of Honolulu Land Use Ordinance Guidelines

The purpose of the 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 County General Plan and development plans. The LUO is also intended to provide reasonable development and design standards. These standards are applicable to the location, height, bulk and size of structures, yard areas, off-street parking facilities, and open spaces, and the use of structures and land for agriculture, industry, business, residences or other purposes (ROH Chapter 21).

Discussion: The subject property is designated as “R-7.5: Residential” zone by the City and County of Honolulu (*Figure 1.4*). The action is not located within a Special District and is not subject to these additional design control standards. The design meets the R-7.5 standards as defined in the LUO. See *Section 2.3* for discussion of compliance with LUO standards. Four homes are allowed to be built on this property based on LUO standards. Only one home with a guest cottage are planned to be built.

5.5 City and County of Honolulu General Plan

The General Plan for the City was adopted in 1977 and has been subsequently amended (most recently in 2002). The General Plan is a comprehensive statement of the long-range social, economic, environmental and design objectives for the general welfare and prosperity of the people of O‘ahu. The objectives and policies are organized into 11 subject areas and are intended to guide and coordinate City land use plans and regulations, and budgeting policies and decisions for public facility capital improvements, operations and maintenance. A Draft 2035 O‘ahu General Plan Update was published for public review in November 2012, and the Revised General Plan was submitted to the City Council in April 2018 for approval. A Final Revised General Plan Update is still pending. The planned residential improvements are consistent with the applicable objectives and policies of the existing City General Plan as amended in 2002, described below.

NATURAL ENVIRONMENT

Objective A: To protect and preserve the natural environment.

- *Policy 1. Protect O'ahu's natural environment, especially the shoreline, valleys, and ridges, from incompatible development.*
- *Policy 6. Design surface drainage and flood-control systems in a manner which will help preserve their natural settings.*
- *Policy 7. Protect the natural environment from damaging levels of air, water, and noise pollution.*
- *Policy 8. Protect plants, birds, and other animals that are unique to the State of Hawai'i and the Island of O'ahu.*

HOUSING

Objective A: To provide decent housing for all the people of Oahu at prices they can afford.

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

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

- *Policy 1. Encourage residential developments that offer a variety of homes to people of different income levels and to families of various sizes.*
- *Policy 4: Encourage residential development in areas where existing roads, utilities, and other community facilities are not being used to capacity.*

PUBLIC SAFETY

Objective B: To protect residents and visitors and their property against natural disasters and other emergencies, traffic and fire hazards, and unsafe conditions.

- *Policy 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.*
- *Policy 7: Provide adequate fire protection and effective fire prevention programs.*

CULTURE AND RECREATION

Objective B: To protect O'ahu's cultural, historic, architectural, and archaeological resources.

- *Policy 2. Identify, and to the extent possible, preserve and restore buildings, sites, and areas of social, cultural, historic, architectural, and archaeological significance.*
- *Policy 3. Cooperate with the State and Federal governments in developing and implementing a comprehensive preservation program for social, cultural, historic, architectural, and archaeological sites, buildings, and artifacts.*

Discussion: The applicant supports the protection and preservation of the natural environment including plants, trees, open spaces and shoreline resources. Short-term air quality and noise quality related to construction activities will be mitigated. Existing views and vistas will not be adversely affected. The scale and size of the action are appropriate to the site and meet the design controls established in the LUO. The residence will not exceed 25 feet in height and will not interfere with existing prominent public vantage points from which the public enjoys significant public views of Diamond Head and the ocean. Perimeter landscaping on the site will serve as a visual buffer to surrounding residential areas.

The site is located within the tsunami evacuation zone and within the FEMA Flood Zones X and VE. Design controls will ensure the planned development meets regulatory requirements. The proposed residence will follow all building codes and standards to ensure health and safety hazards do not occur.

The applicant respects the multi-ethnic cultures found throughout Hawai'i and supports the protection of Hawai'i's cultural, archaeological, and historic resources. Historic resources within the area have been documented in an Archaeological Assessment (Keala Pono, 2021). The studies and trenching of the site did not identify evidence of archaeological remains at the site. The site area has undergone extensive disturbances from previous development and does not possess culturally significant resources. Archaeological monitoring is planned during construction. Refer to *Section 3.5* of the EA.

5.6 City and County of Honolulu Primary Urban Center Development Plan

The island of O'ahu is divided into eight Development Plan areas. Two areas are identified as "development plans," (DPs) which provide guidance for future growth and development, while the other six areas are identified as "sustainable communities plans" (SCP), which aim to maintain the region's character and ensure modest development. Each regional plan implements the objectives and policies of the General Plan for the City and County of Honolulu and provides direction on public policy, investment, and decision-making within each respective region. Together with the General Plan, they guide population and land use growth over a 20- to 25-year time span.

The property is located within the region encompassed by the Primary Urban Center Development Plan (PUC DP). The PUC DP was last revised in June 2004 by Ordinance No. 04-14 and is currently being updated. As of March 2021, the updated PUC DP has not been released. The 2004 PUC DP's vision for the PUC focuses on:

- Protecting and enhancing Honolulu's natural, cultural, and scenic resources
- Creating livable neighborhoods with business centers, parks, plazas, and walkable streets
- Providing in-town housing choices for people of all ages and incomes
- Making Honolulu the Pacific's leading city and travel destination
- Creating a balanced transportation system that provides excellent mobility for residents and visitors.

Discussion: The PUC DP serves to guide development on a neighborhood and regional scale, and the policies are not applicable to a small-scale residential development. The site is designated Lower Density Residential on the PUC DP Land Use Map (*Figure 5.1*). The residential action is consistent with the PUCDP Land Use Map.

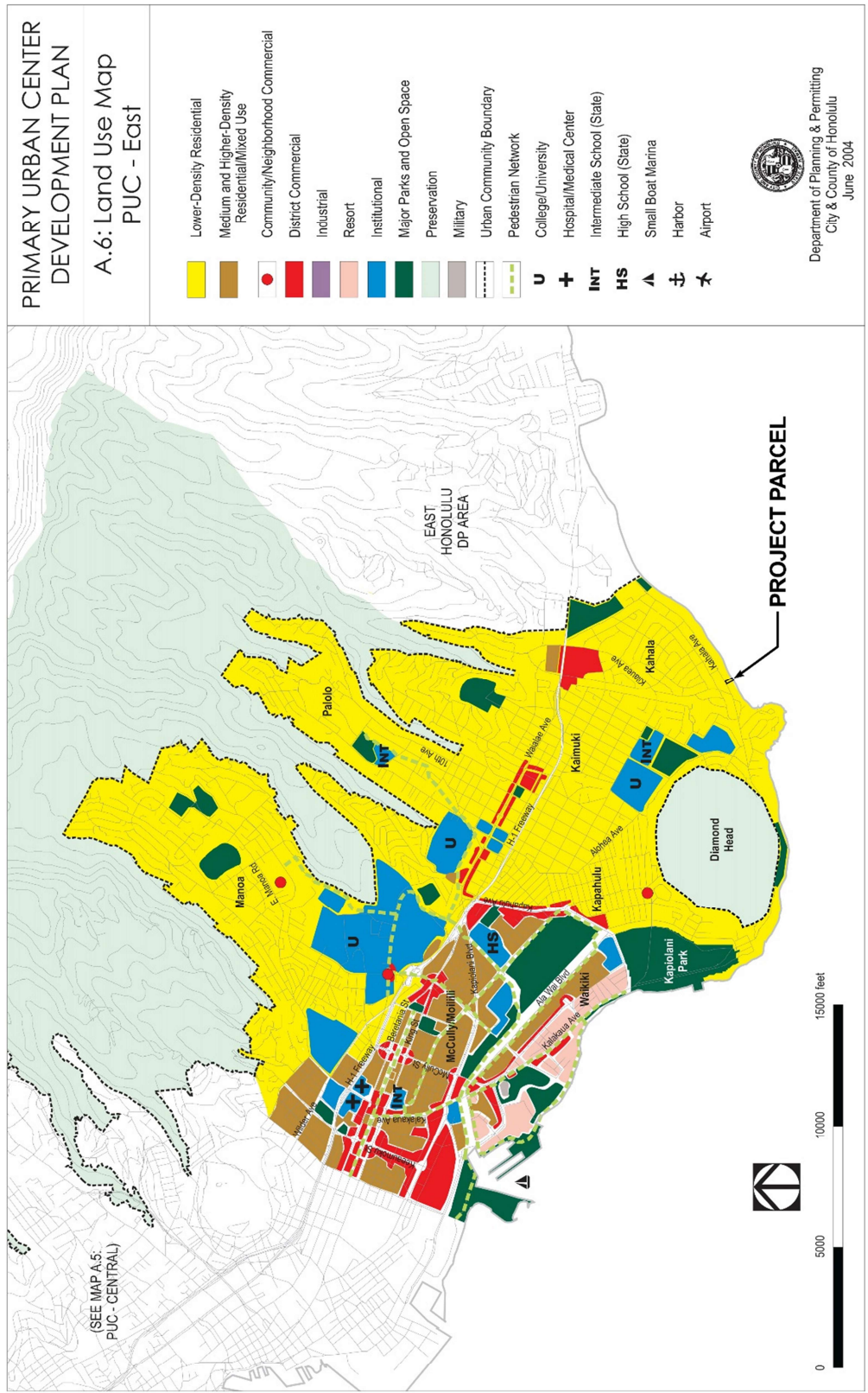


Figure 5.1 City and County of Honolulu Primary Urban Center Development Plan

5.7 City and County of Honolulu Special Management Area Guidelines

The property lies within the SMA (*Figure 1.5*), which was established to preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawai'i. Special controls on development within the SMA are necessary to avoid permanent loss of valuable resources and foreclosure of management options. The review guidelines of ROH §25-3.2 are used by the DPP and the City Council for the review of developments proposed in the SMA. These guidelines are derived from HRS §205A-26.

- (1) *All Development in the SMA shall be subject to reasonable terms and conditions set by the council in order to ensure that:*
 - *Adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas, and natural reserves is provided to the extent consistent with sound conservation principles;*
 - *Adequate and properly located public recreation areas and wildlife preserves are reserved;*
 - *Provisions are made for solid and liquid waste treatment, disposition, and management that will minimize adverse effects upon special management area resources; and*
 - *Alterations to existing land forms and vegetation, except crops, and construction of structures shall cause minimum adverse effect to water resource, beaches, coastal dunes, and scenic and recreational amenities and minimize impacts from floods, landslides, erosion, sea level rise, siltation or failure in the event of an earthquake.*

- (2) *No development shall be approved unless the council has first found that:*
 - *The development will not have any significant adverse environmental or ecological effect except as any adverse effect is minimized to the extent practicable and clearly outweighed by public health and safety, or compelling public interests. Those adverse effects shall include but not be limited to the potential cumulative impact of individual developments, each of which taken by itself might not have a significant adverse effect, and the elimination of planning options;*
 - *The development is consistent with the objectives and policies set forth in Section 25-3.2 and area guidelines contained in Section 205A-26, Hawai'i Revised Statutes; and*
 - *The development is consistent with the County General Plan, Community Plan, and zoning provided that a finding of consistency shall not preclude concurrent processing where a General Plan, Community Plan, or zoning amendment may also be required.*

- (3) *The Council shall seek to minimize, where reasonable:*
 - *Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough or lagoon;*
 - *Any development that would reduce the size of any beach or other area usable for public recreation;*
 - *Any development that would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams within the special management area and the mean high tide line where there is no beach;*
 - *Any development that would substantially interfere with or detract from the line of sight toward the sea from the State highway nearest the coast; and*

- *Any development that would adversely affect water quality, existing areas of open water free of visible structure, existing and potential fisheries and fishing grounds, wildlife habitats, or potential or existing agricultural uses of land.*

Discussion: The property lies within the boundary of the City and County of Honolulu’s Special Management Area (SMA) (*Figure 1.5*). Proposed improvements within the SMA are subject to SMA permit requirements pursuant to Section 205A, HRS, and Chapter 25 Revised Ordinances of Honolulu. An SMA Permit application will be submitted to the City and County of Honolulu Department of Planning and Permitting.

The closest public access to the beach area fronting the site is located east of the subject parcel, across from Kala Place. The proposed action will not adversely affect access to existing public shoreline or recreation areas. No wildlife preserves or public areas are affected by the action.

Provisions will be made to ensure solid and liquid waste treatment, disposition, and management will have minimum adverse effects upon Special Management Area resources. Wastewater will connect to the City and County of Honolulu operated sewer system. The design of the on-site sewer system will be in accordance with the Wastewater Design Standards of the City and County of Honolulu’s Department of Environmental Services (ENV). Solid waste will be handled and disposed of by ENV.

Alterations to the land and vegetation will not adversely affect coastal areas or recreational resources. The proposed action will require removal of scrub/weed vegetation (non-native species) and grading and grubbing for the construction of new facilities. Views from Kāhala Avenue will be improved with new landscaping. The action is a redevelopment of an existing residential lot and will not increase the potential hazard risk associated with flooding, landslides, erosion, siltation or earthquake. The design and construction will meet or exceed County building standards.

No substantial adverse environmental or ecological direct, indirect or cumulative impacts are anticipated from the action. Potential environmental impacts of the residential use and the mitigation strategies to minimize adverse effects are described in *Section 3.0* of this EA. The action is consistent with applicable plans and policies of the State of Hawai‘i and the City and County of Honolulu.

There will be no adverse impact to public accesses, public beaches or recreation areas. The new residence will be developed over 55 feet mauka from the shoreline. The action will have no adverse effects on areas of open water, potential fisheries, fisheries, wildlife habitat, or agricultural land. Best management practices and other mitigative strategies will be utilized to minimize effects on water quality. The action will adhere to LUO height and size restrictions and will be similar in the overall size and scale to existing residential developments in the vicinity of the action. There is no line of sight to the ocean from the nearest State highway.

5.8 Land Use Ordinance Section 21A Flood Hazard Areas

The Honolulu Land Use Ordinance §21A was enacted pursuant to the U.S. National Flood Insurance Act of 1968, as amended, and the U.S. Flood Disaster Protection Act of 1973, as amended. Areas that are subject to periodic inundation by flooding and/or tsunami may result in loss of life and property. The purposes of establishing flood hazard districts are to protect life and property and reduce public costs for flood control, rescue, and relief efforts.

The parcel is located in Zones X and VE as shown on the 2021 FEMA Digital Flood Insurance Rate Map (DFIRM) (*Figure 1.6*). The Flood Zone X designation indicates the area is outside of the 0.2% annual chance floodplain. This portion of the property is not located in a Special Flood Hazard Area as defined by LUO §21A. However, a small portion of the parcel along with the adjacent coastal area is located in Flood Zone VE, indicating a coastal high hazard area subject to inundation by the 1% annual chance flood event with additional hazards due to storm-induced velocity wave action. Floodplain management standards and mandatory flood insurance purchase requirements for residents with a federally backed mortgage apply for this zone.

Discussion: Majority of the subject parcel is not located in a Special Flood Hazard Area as defined by the LUO §21A. However, the property will adhere to development standards within the Flood Hazard District, such as no more than two dwelling units on the property. Construction work will be performed in accordance with the State and County-approved design standards. New site infrastructure will be designed and constructed to meet applicable standards. No significant adverse impacts are anticipated.

Findings Supporting the Anticipated Determination

Chapter 6

Findings Supporting the Anticipated Determination

6.1 Anticipated Determination

Based on a review of the significance criteria outlined in HRS §343 and HAR §11-200.1-13, it is anticipated that the Department of Planning and Permitting (DPP) will find that the planned development of residences at the subject property will not result in significant adverse effects on the natural or human environment. A Finding of No Significant Impact (FONSI) is anticipated.

6.2 Reasons Supporting the Anticipated Determination

The potential impacts of the residential improvements have been fully examined and discussed in this Environmental Assessment (EA). As stated earlier, there are no significant environmental impacts expected to result from the planned improvements. This determination is based on the assessments as presented below for criterion (1) to (13).

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

The archaeological and cultural landscapes have been documented in studies conducted specifically for the property. As detailed in *Chapter 3.6* of this report, the property does not involve any known loss or destruction of existing natural or cultural resources. Even with the negative findings of subsurface testing, there is the unknown potential for the inadvertent discovery of subsurface historical or cultural resources, including the unknown possibility of iwi kūpuna (ancestral remains).

Given the potential for an inadvertent find, archaeological monitoring is planned during demolition and construction. If any cultural, historic, or archaeological resources are unearthed or ancestral remains are inadvertently discovered, the State Department of Land and Natural Resources (DLNR), State Historic Preservation Division (SHPD), the O'ahu Island Burial Council representative and participating interests from lineal descendants and individuals will be notified. The treatment of these resources will be conducted in strict compliance with the applicable historic preservation and burial laws.

No threatened or endangered species will be affected by the residential improvements.

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

The residential activities will not curtail the range of beneficial uses of the environment. Existing uses conform to existing land use designations. The proposed residence would actually increase beneficial uses of the parcel, replacing vacant, untended land with a revitalized residential use and landscaping.

There will be no impact on public access to the shoreline and no significant change in lateral access along the shore. No structures will be built within the shoreline setback. There will be no impact to fishing on the reef flat seaward of the property.

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

The residential improvements do not conflict with State's long-term environmental policies or goals and guidelines as expressed in HRS §344, and any revisions thereof and amendments thereto, court decision, or executive orders. State waters will not be affected.

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

The proposed action would have no adverse social or economic impact to the State. Short-term economic benefits anticipated during construction will include direct, indirect, and induced employment opportunities and multiplier effects, but not at a level that would generate significant economic expansion.

- (5) *Have a substantial adverse effect on public health.*

The proposed action is consistent with existing land uses and is not expected to affect public health, except in beneficial ways mentioned in item four above. However, there will be temporary short-term effects to air quality emanating from possible dust emissions and temporary degradation of the acoustic environment in the immediate vicinity resulting from construction equipment. Construction-related effects of noise, dust, and emissions will be mitigated by compliance with the State Department of Health Administrative Rules.

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

The proposed action will not have substantial secondary impacts, such as population changes or effects on public facilities.

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

The proposed action will have no significant adverse environmental effects, nor will it degrade environmental quality. It will not degrade water quality, nor impact marine flora and fauna. The proposed action will not involve development within the shoreline setback area.

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

The property is located in an area subject to the combined effects of SLR, flooding, storm surge, wave action, and shoreline erosion. Mitigative improvements will not have substantial negative effects upon the environment and will not be a precursor for future actions.

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

No rare, threatened, or endangered species or habitats are present on-site nor will be substantially affected by this residential use.

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

General temporary impacts associated with construction are identified in *Chapter 3.0* of this EA. Mitigation measures which are outlined in this EA will be applied during the on-going construction activity. No detrimental long-term impacts to air, water, or acoustic quality are anticipated with the planned improvements.

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

The property is located within Flood Zones X and VE and is also located within the designated tsunami zone (*Figure 1.6*). Therefore, the residential use will comply with necessary design requirements. Construction work will be performed in accordance with the State and County-approved design standards. To prevent ponding or localized flooding resulting from storm run-off, existing drainage infrastructure will be maintained. New site infrastructure will be designed and constructed to meet applicable standards. No significant adverse effects are anticipated. Refer to *Chapter 3.4* for additional details relating to natural hazards.

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

The site is visible from Kāhala Avenue and the public shoreline. The new residential structures will not exceed 25 feet in height will have no effect on public views of Diamond Head or other scenic view planes. Landscaping will enhance views from Kāhala Avenue.

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

The residence is not anticipated to require substantial energy consumption or emit substantial GHGs when compared to other similar-sized homes. In an effort to reduce energy consumption, the proposed residence is anticipated to incorporate renewable energy technology, energy conservation best practices such as energy-efficient mechanical and electrical systems to maximize energy savings, and provisions for electric vehicle (EV) compatible parking. No long-term impacts to energy resources or increase in GHG emissions are anticipated.

6.3 Summary

Based on the above findings, further evaluation of the proposed residence impacts through the preparation of an Environmental Impact Statement is not warranted. The EA recommends mitigation measures to alleviate impacts where such impacts are identified. A FONSI is anticipated.

The action is consistent with the Hawai'i State Plan, Hawai'i State Land Use District Boundaries; the Hawai'i Coastal Zone Management Plan, the City's General Plan and Development Plan; the City's Zoning Ordinance, and Special Management Area regulations.

**List of Agencies,
Organizations and Individuals
Receiving Copies of the EA**

Chapter 7

List of Agencies, Organizations and Individuals Receiving Copies of the EA

7.1 Consultation List

Early consultation on the planned improvements has been carried out with various agencies and stakeholders as part of the scoping process for this proposed residence. Parties contacted in preparation of the Draft Environmental Assessment (EA) process, comments received, those that were provided an opportunity to review the Draft EA, and Draft EA comments received are identified below. A summary of comments received during these consultation processes are also provided following this list.

Table 7.1 Agencies, Organizations and Individuals Receiving Copies of the EA			
Respondents and Distribution	Early Consultation	Receiving Draft EA	Draft EA Comments Received
Federal Agencies			
U.S. Army Corps of Engineers		X	
U.S. Department of the Interior, Fish and Wildlife Service		X	
State of Hawai'i Agencies			
Department of Health (DOH), Environmental Health Administration		X	
DOH, Clean Air Branch		X	
DOH, Clean Water Branch		X	
DOH, Environmental Management Division		X	
DOH, Safe Drinking Water Branch		X	
DOH, Solid and Hazardous Waste Branch		X	
Department of Land and Natural Resources (DLNR), Land Division		X	
DLNR, Division of Aquatic Resources		X	
Office of Hawaiian Affairs		X	
Office of Planning		X	
City and County of Honolulu Agencies			
Board of Water Supply		X	

Table 7.1 Agencies, Organizations and Individuals Receiving Copies of the EA			
Respondents and Distribution	Early Consultation	Receiving Draft EA	Draft EA Comments Received
City and County of Honolulu Agencies			
Department of Facilities Maintenance		X	
Department of Planning and Permitting	X	X	
Department of Transportation Services		X	
Honolulu Fire Department		X	
Honolulu Police Department		X	
Office of Climate Change, Sustainability and Resiliency		X	
Elected Officials			
Senator Stanley Chang – State Senate District 9	X	X	
Representative Bertrand Kobayashi – State House District 19	X	X	
Mayor Rick Blangiardi		X	
Council Chair Tommy Waters – Honolulu City Council District 4	X	X	
Waiālae-Kahala Neighborhood Board No. 3	X	X	
Libraries			
Hawai‘i State Library		X	
Kaimukī Public Library		X	
Individuals			
Daikicho Sato, Representative of adjacent neighbor	X	X	
Lucinda Pyles	X	X	

7.2 Early Consultation Summary

A summary of comments received during the early consultation period by major topics and associated responses is provided in *Table 7.2* below. Refer to comment letters located after *Table 7.2*.

Table 7.2 DEA Summary of Early Consultation Comments and Responses

Comments	Commenter	Responses
Activities in the Shoreline Setback Area / Certified Shoreline Survey		
<p>In 2014, when my husband was on the NHB, the Board was involved in the EA process for two abutting vacant properties in the same area, 4465 & 4469 Kahala Ave. DLNR required the removal of an un-permitted seawall prior to certification resulting in the recovery of a white sand beach fronting these properties. (See Google Earth photograph below showing the white sand beach only a few properties NE of 4439.) Development at 4439 has been placed on the NHB agenda for this month. Your communication does not mention the seawall or any planned structures, pool, fencing, gazebo, ?? in the 40 foot shoreline setback area. We believe before comments can be made, you need to divulge the proposed plans for the setback area. After all, what will ultimately impact the public beach over time is what is in this area as we have seen from recent articles in the news that have been exposing what property owners have been doing in the setback area causing extreme adverse consequences for the public trust resource.</p> <p>Please provide Representative Kobayashi and others who you have contacted requesting early comments with information about the seawall and any structures or landscaping in the setback area as well as the status of a shoreline certification.</p>	Pyles	<p>The residential structures will be located greater than 55 feet (ft) from the shoreline and outside of the shoreline setback area (40 ft inland from the shoreline). A 1983 certified shoreline survey (Sam O. Hirota Inc.) identifies the certified shoreline as delineated along the face of a seawall. Preliminary landscaping plans include planting a line of Dwarf Natal plum (<i>Carissa sp.</i>) immediately behind the seawall. This would be trimmed to a low height and maintained at 18 to 24 inches tall.</p>
<p>With a 55 foot setback, do you avoid a shoreline certification requirement?</p>	Pyles	<p>The new home will be situated 61 feet from the previous certified shoreline and qualifies for a waiver of the requirement for a new certified shoreline. We understand that approval of a waiver of the requirement for a new certified shoreline is subject to the discretion of the DPP Director.</p>
<p>Not much to comment on, given your very brief description.</p> <ol style="list-style-type: none"> 1. not a monster house, as elsewhere recently on Kahala Ave. 2. many changes of recent and upcoming with beach front, erosion, exemptions, etc.. 3. is the current seawall unpermitted?...and what is the condition? ...and any expected future requests for rebuilding/renovation of this seawall? <p>As emailed to you prior, the Kahala Neighborhood Board dealt with a nearby property, 4 properties east, with an amazing outcome, ie, a new beautiful white sand beach, sand coming naturally from the ocean to create this new beach, showing that beach restoration is possible and QUICKLY SO. See your emailed photos for evidence.</p>	Rep. Kobayashi	<p>The existing concrete rubble masonry seawall was constructed along the property shoreline prior to 1946 and is classified as a nonconforming structure. The seawall remains in good condition today, therefore there are no plans for any seawall modifications.</p>

Table 7.2 DEA Summary of Early Consultation Comments and Responses

Comments	Commenter	Responses
<p>Show your client this new nearby beach,...and ask: what value would you put on an amenity such as a semi-private white sand beach [such as the beach nearby]. Semi-private because as you know, it will be difficult to get to your client's oceanfront except via the ocean and also because very few people will know about this beach, if and when it exists. [to get to the new existing nearby beach, you have to walk in the water or walk/scamper (gingerly, carefully) on the big rocks along the shore EVEN during low tide.]</p>		
<p><u>Onsite Structures:</u> Please describe all existing structures that remain on site, including residences, garages, swimming pools, lanais, stairways, shoreline hardening structures, etc. If any existing structures are proposed to remain in place, the DEA should describe what and where they are located, whether they were lawfully established, and whether they are located within any required setback areas. Such structures should be included in the DEA's analysis of the Project's compliance with the applicable development standards in the LUO.</p>	DPP	Existing on-site structures are described in the EA under <i>Section 2.1 Existing Conditions and Site Preparation</i> .
<p><u>Shoreline Setback:</u> According to the information provided in your submittal, the proposed residence would be located greater than 55 feet from the regulatory shoreline. We note all development, including the guest house and any other accessory structures must also be located outside of the shoreline setback area. The distance from the shoreline must also be confirmed on a shoreline survey certified by the State of Hawaii, and must also be reflected in the plans submitted for the SMA Use Permit to confirm compliance with the Shoreline Setback Ordinance (Chapter 23, ROH). This information, and a copy of the Shoreline Survey, should be included and evaluated in the DEA. A Certified Shoreline Survey should be included in the Final EA.</p> <p>Alternatively, if the Applicant is seeking to avoid completion of a Certified Shoreline Survey, the DEA should identify the specific proposed shoreline setback distance, and any documentation available providing evidence of the location of the shoreline from which the 55-foot setback line was measured. Such information may include, but is not limited to, a previously certified shoreline survey, site-specific survey, erosion and/or accretion information, historic versus current photographs, and physical or geographic markers such as survey pins or trees that document the level of change in the shoreline since the most recent certified shoreline survey. Please note that approval of a 55-foot shoreline Waiver Line, as opposed to the standard 40-foot shoreline setback line, is subject to the discretion of the Director of the Department of Planning and Permitting.</p>	DPP	A previously approved Certified Shoreline Survey is located in <i>Appendix A</i> of the EA. We understand that approval of a 55-foot shoreline Waiver Line, as opposed to the standard 40-foot shoreline setback line, is subject to the discretion of the Director of the DPP.
Standards and Regulations		
<p><u>Land Use Ordinance (LUO: Chapter 21, Revised Ordinances of Honolulu [ROH1]):</u> Based on a review of our records, the Project site consists of a 35,428-square-foot shoreline zoning lot located in the R-7.5 Residential District. Therefore, proposed development activities must</p>	DPP	Project compliance with LUO Chapter 21 is described in both <i>Section 2.3</i> and <i>Section 5.4</i> of the EA.

Table 7.2 DEA Summary of Early Consultation Comments and Responses

Comments	Commenter	Responses
<p>comply with the development standards applicable to the R-7.5 District. Project compliance with these standards should be presented and evaluated in Chapter 5 of the DEA.</p>		
<p><u>Special Management Area (SMA) Permit Required:</u> As noted in your submittal, on September 15, 2020, Governor Ige signed Act 16 (2020) into law. The stated purpose of Act 16 (2020) is to strengthen the State's coastal zone management policy by amending Chapter 205A, Hawaii Revised Statutes (HRS), to protect state beaches, and to reduce residential exposure to coastal hazards.</p> <p>Under Chapter 25, ROH, uses, activities, or operations considered “development” are subject to review. As a result of Act 16 (2020), the single-family residential exclusion from the definition of “development” was revised as follows:</p> <p><i>“Development” does not include the following:</i> <i>(1) Construction or reconstruction of a single-family residence that is less than seven thousand five hundred square feet of floor area, is <u>not situated on a shoreline parcel or a parcel that is impacted by waves, storm surges, high tide, or shoreline erosion</u>, and is not part of a larger development.</i></p> <p>Consequently, the Project, which proposes construction of residences on a shoreline parcel within the SMA, is considered development under Chapter 205A, HRS, because it is a shoreline lot. Therefore, the DEA should include in its analysis all of the required components for an SMA Use Permit under both Chapter 205A, HRS and Chapter 25, ROH.</p>	DPP	The EA includes in its analysis the required components for an SMA Use Permit under both Chapter 205A, HRS and Chapter 25, ROH.
Flooding and Sea Level Rise		
<p><u>Flood Zone:</u> The Project site is located in Flood Zones X and VE. VE Zone is considered a coastal high hazard zone subject to high velocity wave action. Therefore, the DEA should discuss the Project’s compliance with the City’s Flood Hazard Areas Ordinance (Chapter 21A, ROH).</p>	DPP	The project as it relates to LUO §21A Flood Hazard Areas is described in <i>Section 5.8</i> of the EA.
<p><u>Coastal Hazards:</u> The Project site is susceptible to Sea Level Rise (SLR), tsunamis and storm surge. Mayor’s Directive 18-2, issued on July 16, 2018, requires all City departments and agencies to use the SLR Guidance and the Hawaii SLR Vulnerability and Adaptation Report in planning decisions. The recent amendments to Chapter 205A, HRS, under Act 16 (2020), reiterate the need to evaluate potential impacts related to coastal hazards and SLR. As such, the following items need to be evaluated in a <u>site-specific</u> Coastal Hazards Study prepared for both the DEA and SMA Use Permit application prepared for the Project:</p> <ul style="list-style-type: none"> • SLR - According to the State Pacific Islands Ocean Observing System SLR Viewer, 	DPP	Sea Level Rise and storm surge are discussed in the EA under <i>Section 3.3 Natural and Manmade Hazards</i> . Ways to reduce potential impacts to the development are also included in <i>Section 3.3</i> .

Table 7.2 DEA Summary of Early Consultation Comments and Responses

Comments	Commenter	Responses
<p>approximately one fifth of the subject property. is anticipated to be subject to 0.5 feet of SLR in the near-term, and approximately half of the property is subject to 3.2 feet of SLR by as soon as 2060. Further, SLR is likely to exacerbate the current level of flood hazard on the site in the near term.</p> <ul style="list-style-type: none"> Storm Surge - National Hurricane Storm Surge Hazard Maps indicate coastal area along the Project site may be subject to flooding inundation of more than three feet above ground level during a Category 1 or greater hurricane event. <p>The DEA should explore ways to reduce potential impacts to the development including siting the dwellings as far from the shoreline as possible.</p>		

Early Consultation Letters

Barbara Natale

From: Pyles <kahalabob@aol.com>
Sent: Monday, February 8, 2021 12:11 PM
To: 219035-01 4439 Kahala
Cc: repkobayashi@capitol.hawaii.gov; richturbin@turbin.net; gay@gaycoburngale.com; davin.aoyagi@honolulu.gov
Subject: Re: 4439 Kāhala Avenue - Environmental Assessment Early Consultation

Aloha Barbara,

I am a 50 year resident of Kahala Ave and a former member of the Waiialae-Kahala Neighborhood Board (NHB). Kahala Beach is very near and dear to me, to my family and to other residents. Representative Kobayashi forwarded your email regarding the draft EA your firm is preparing for the planned developments at 4439 Kahala Ave.

In 2014, when my husband was on the NHB, the Board was involved in the EA process for two abutting vacant properties in the same area, 4465 & 4469 Kahala Ave. DLNR required the removal of an un-permitted seawall prior to certification resulting in the recovery of a white sand beach fronting these properties. (See Google Earth photograph below showing the white sand beach only a few properties NE of 4439.) Development at 4439 has been placed on the NHB agenda for this month. Your communication does not mention the seawall or any planned structures, pool, fencing, gazebo, ?? in the 40 foot shoreline setback area. We believe before comments can be made, you need to divulge the proposed plans for the setback area. After all, what will ultimately impact the public beach over time is what is in this area as we have seen from recent articles in the news that have been exposing what property owners have been doing in the setback area causing extreme adverse consequences for the public trust resource.

Please provide Representative Kobayashi and others who you have contacted requesting early comments with information about the seawall and any structures or landscaping in the setback area as well as the status of a shoreline certification.

Thank you.
Lucinda Pyles
808-732-6262

- Google Search

mental version of Earth.



Barbara Natale

From: Rep. Bertrand Kobayashi <repkobayashi@capitol.hawaii.gov>
Sent: Monday, February 8, 2021 3:26 PM
To: 219035-01 4439 Kahala
Cc: richturbin@turbin.net; gay@gaycoburngale.com; davin.aoyagi@honolulu.gov; Pyles; Rep. Bertrand Kobayashi
Subject: reply-RE: 4439 Kāhala Avenue - Environmental Assessment Early Consultation

Hello, B. Natale,

Not much to comment on, given your very brief description.

1. not a monster house, as elsewhere recently on Kahala Ave.
2. many changes of recent and upcoming with beach front, erosion, exemptions, etc..
3. is the current seawall unpermitted?...and what is the condition? ...and any expected future requests for rebuilding/renovation of this seawall?

As emailed to you prior, the Kahala Neighborhood Board dealt with a nearby property, 4 properties east, with an amazing outcome, ie, a new beautiful white sand beach, sand coming naturally from the ocean to create this new beach, showing that beach restoration is possible and QUICKLY SO. See your emailed photos for evidence.

Show your client this new nearby beach,...and ask: what value would you put on an amenity such as a semi—private white sand beach [such as the beach nearby]. Semi-private because as you know, it will be difficult to get to your client's oceanfront except via the ocean and also because very few people will know about this beach, if and when it exists. [to get to the new existing nearby beach, you have to walk in the water or walk/scamper (gingerly, carefully) on the big rocks along the shore EVEN during low tide.]

/Bertrand Kobayashi

State Representative

Diamond Head, Kahala, Kaimuki, Kapahulu

Barbara Natale

From: Pyles <kahalabob@aol.com>
Sent: Friday, February 19, 2021 11:46 AM
To: 219035-01 4439 Kahala; repkobayashi@capitol.hawaii.gov
Cc: richturbin@turbin.net; gay@gaycoburngale.com; davin.aoyagi@honolulu.gov
Subject: Re: reply-RE: 4439 Kāhala Avenue - Environmental Assessment Early Consultation

Barbara,

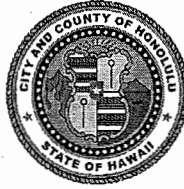
It was nice to meet you last night. I apologize for not including 4439 with the other Kahala Beach items brought before the NHB. We did not expect you. With no response from Group70 to our emails and little information provided in your initial email to Rep. Kobayashi, it seemed best to defer. I am wondering how you knew it was on the agenda. With a 55 foot setback, do you avoid a shoreline certification requirement? We look forward to hearing from you.

Lucinda Pyles
732-6262

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

850 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
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RICK BLANGIARDI
MAYOR



DEAN UCHIDA
DIRECTOR

DAWN TAKEUCHI APUNA
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

March 25, 2021

2021/ELOG-216(CK)

Ms. Barbara Natale, AICP
G70
111 South King Street, Suite 170
Honolulu, Hawaii 96813

Dear Ms. Natale:

SUBJECT: Request for Pre-Consultation Comments
Environmental Assessment for Residences on Shoreline Lot
4439 Kahala Avenue - Kahala
Tax Map Keys 3-5-003: 007

This is in response to your email, received February 2, 2021, requesting comments on the scope and content to be addressed in a Draft Environmental Assessment (DEA), as required under Chapter 343, Hawaii Revised Statutes, for two proposed single-family dwellings at the above-referenced property. We understand that the Project proposes two single-story, single-family detached dwelling units, including one 4,500-square-foot primary residence, and a 1,000-square-foot guest cottage. The subject property is a 35,428-square-foot shoreline lot in Kahala. Given this, the following are our comments for the items to address in the DEA:

1. Land Use Ordinance (LUO; Chapter 21, Revised Ordinances of Honolulu [ROH]): Based on a review of our records, the Project site consists of a 35,428-square-foot shoreline zoning lot located in the R-7.5 Residential District. Therefore, proposed development activities must comply with the development standards applicable to the R-7.5 District. Project compliance with these standards should be presented and evaluated in Chapter 5 of the DEA. The latest version of the LUO is available on our website at:

www.honoluluodpp.org/ApplicationsForms/ZoningandLandUsePermits
2. Onsite Structures: Please describe all existing structures that remain on site, including residences, garages, swimming pools, lanais, stairways, shoreline hardening structures, etc. If any existing structures are proposed to remain in place, the DEA should describe what and where they are located, whether they were lawfully established, and whether they are located within any required

setback areas. Such structures should be included in the DEA's analysis of the Project's compliance with the applicable development standards in the LUO.

3. Special Management Area (SMA) Permit Required: As noted in your submittal, on September 15, 2020, Governor Ige signed Act 16 (2020) into law. The stated purpose of Act 16 (2020) is to strengthen the State's coastal zone management policy by amending Chapter 205A, Hawaii Revised Statutes (HRS), to protect state beaches, and to reduce residential exposure to coastal hazards.

Under Chapter 25, ROH, uses, activities, or operations considered "development" are subject to review. As a result of Act 16 (2020), the single-family residential exclusion from the definition of "development" was revised as follows:

"Development" does not include the following:

(1) Construction or reconstruction of a single-family residence that is less than seven thousand five hundred square feet of floor area, is not situated on a shoreline parcel or a parcel that is impacted by waves, storm surges, high tide, or shoreline erosion, and is not part of a larger development.

Consequently, the Project, which proposes construction of residences on a shoreline parcel within the SMA, is considered development under Chapter 205A, HRS, because it is a shoreline lot. Therefore, the DEA should include in its analysis all of the required components for an SMA Use Permit under both Chapter 205A, HRS and Chapter 25, ROH. The revised text of Chapter 205A, HRS as amended by Act 16 (2020) is available online at:

https://www.capitol.hawaii.gov/session2020/bills/SB2060_HD2_.htm

Chapter 25, ROH, SMA. Chapter 25 is available online at:

http://www.honolulu.gov/rep/site/ocs/roh/ROH_Chapter_25_article_1_12.pdf

4. Shoreline Setback: According to the information provided in your submittal, the proposed residence would be located greater than 55 feet from the regulatory shoreline. We note all development, including the guest house and any other accessory structures must also be located outside of the shoreline setback area. The distance from the shoreline must also be confirmed on a shoreline survey certified by the State of Hawaii, and must also be reflected in the plans submitted for the SMA Use Permit to confirm compliance with the Shoreline Setback Ordinance (Chapter 23, ROH). This information, and a copy of the Shoreline Survey, should be included and evaluated in the DEA. A Certified Shoreline Survey should be included in the Final EA.

Alternatively, if the Applicant is seeking to avoid completion of a Certified Shoreline Survey, the DEA should identify the specific proposed shoreline setback distance, and any documentation available providing evidence of the location of the shoreline from which the 55-foot setback line was measured. Such information may include, but is not limited to, a previously certified shoreline survey, site-specific survey, erosion and/or accretion information, historic versus current photographs, and physical or geographic markers such as survey pins or trees that document the level of change in the shoreline since the most recent certified shoreline survey. Please note that approval of a 55-foot shoreline Waiver Line, as opposed to the standard 40-foot shoreline setback line, is subject to the discretion of the Director of the Department of Planning and Permitting.

Chapter 23, ROH, is available online at:

http://www.honolulu.gov/rep/site/ocs/roh/ROH_Chapter_23_.pdf

5. Flood Zone: The Project site is located in Flood Zones X and VE. VE Zone is considered a coastal high hazard zone subject to high velocity wave action. Therefore, the DEA should discuss the Project's compliance with the City's Flood Hazard Areas Ordinance (Chapter 21A, ROH).
6. Coastal Hazards: The Project site is susceptible to Sea Level Rise (SLR), tsunamis and storm surge. Mayor's Directive 18-2, issued on July 16, 2018, requires all City departments and agencies to use the SLR Guidance and the Hawaii SLR Vulnerability and Adaptation Report in planning decisions. The recent amendments to Chapter 205A, HRS, under Act 16 (2020), reiterate the need to evaluate potential impacts related to coastal hazards and SLR. As such, the following items need to be evaluated in a site-specific Coastal Hazards Study prepared for both the DEA and SMA Use Permit application prepared for the Project:
 - SLR - According to the State Pacific Islands Ocean Observing System SLR Viewer, approximately one fifth of the subject property is anticipated to be subject to 0.5 feet of SLR in the near-term, and approximately half of the property is subject to 3.2 feet of SLR by as soon as 2060. Further, SLR is likely to exacerbate the current level of flood hazard on the site in the near term.
 - Storm Surge - National Hurricane Storm Surge Hazard Maps indicate coastal area along the Project site may be subject to flooding inundation of more than three feet above ground level during a Category 1 or greater hurricane event.

Ms. Barbara Natale
March 25, 2021
Page 2

The DEA should explore ways to reduce potential impacts to the development including siting the dwellings as far from the shoreline as possible. Relevant sources are available online at the following links:

- Mayor's Directive No. 18-2 (2018) regarding climate change and sea level rise:
https://www.honolulu.gov/rep/site/dppto/climate_docs/MAYORS_DIRECTIVE_18-2.pdf
- Vulnerability Report:
http://climate.hawaii.gov/wp-content/uploads/2019/02/SLR-Report_Dec2017-with-updated-disclaimer.pdf
- Hawaii Sea Level Rise Exposure Area (SLR-XA) Mapping Tool:
<https://www.pacioos.hawaii.edu/shoreline/slr-hawaii/>
- National Oceanic and Atmospheric Administration SLR Mapping Tool:
<https://www.nhc.noaa.gov/nationalsurge/>
- Honolulu Office of Climate Change, Sustainability and Resiliency Climate Ready Oahu Web Explorer: <https://resilientoahu.org/water>
- Storm Surge:
<https://noaa.maps.arcgis.com/apps/MapSeries/index.html?appid=d9ed7904dbec441a9c4dd7b277935fad&entry=3>

Thank you for the opportunity to comment on this proposal. Should you have any questions, please contact Christi Keller, of our staff, at (808) 768-8087, or c.keller@honolulu.gov.

Very truly yours,



For: Dean Uchida
Director

cc: Ms. Barbara Natale (via email: 4439kahala@G70.design)

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Chapter 8

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Appendices

Appendix A

Certified Shoreline Survey

Appendix B

Preliminary Site Plans

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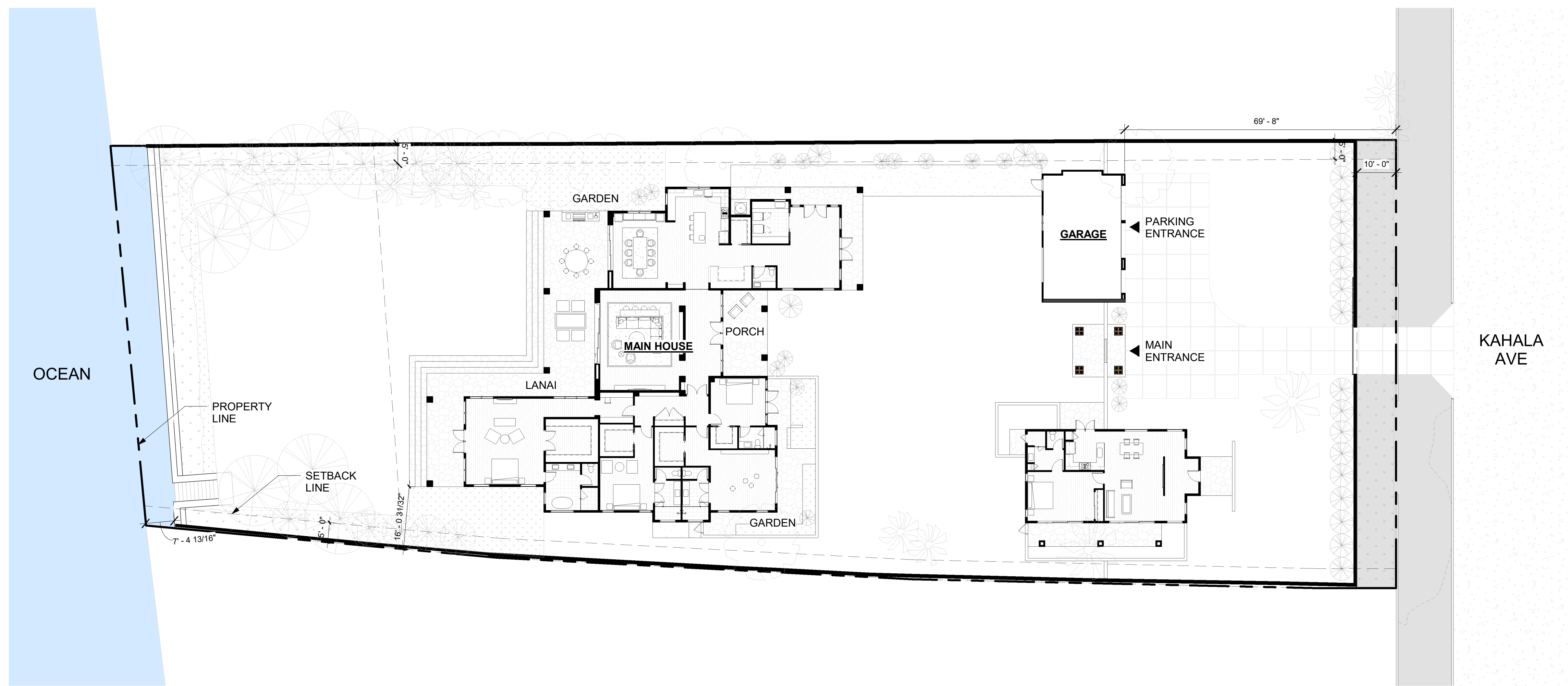
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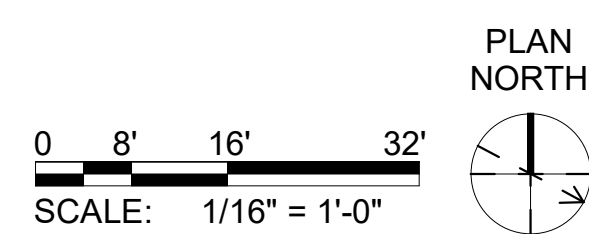
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A



A1 ARCHITECTURAL SITE PLAN
 1/16" = 1'-0"

A-001



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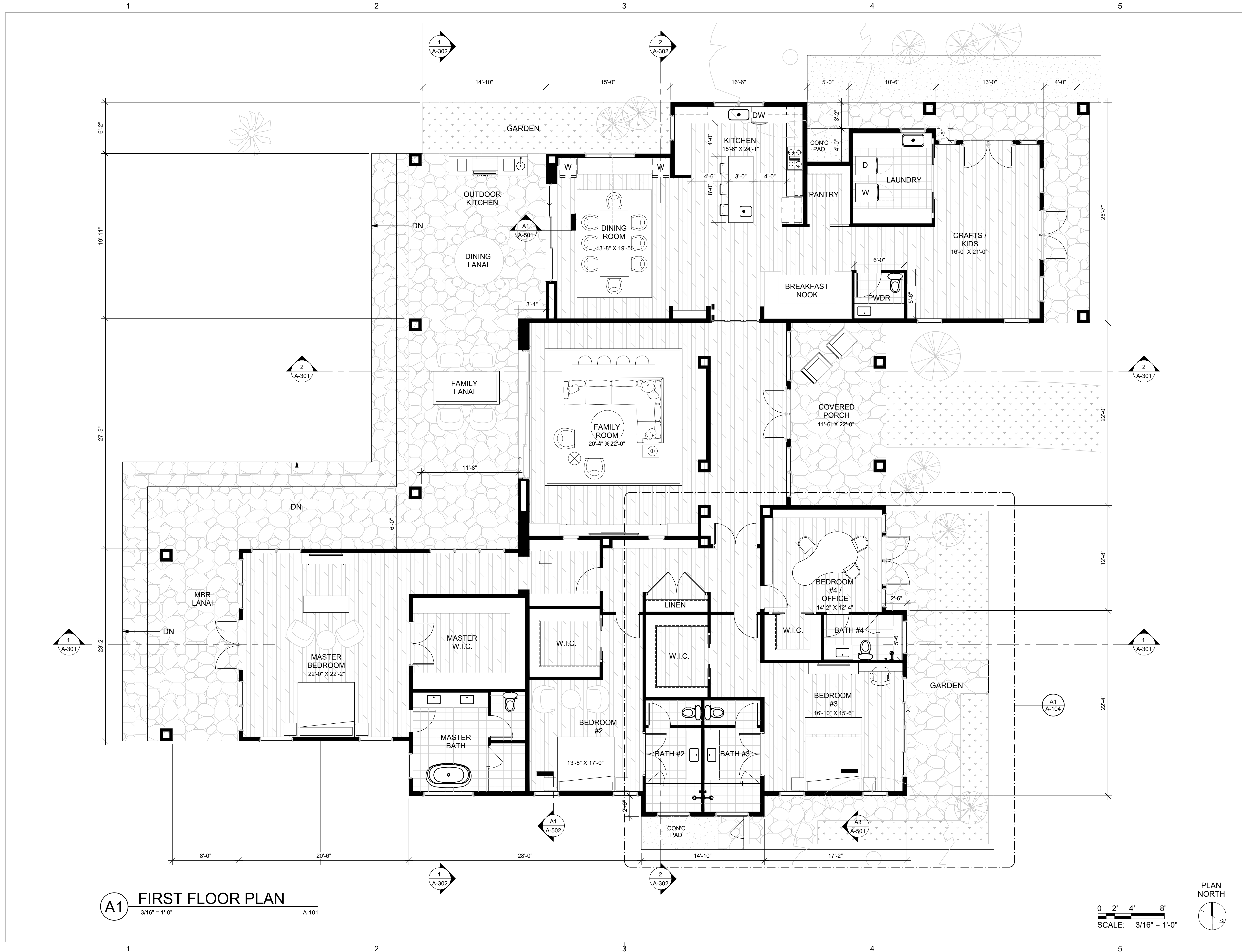
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4439 KAHALA LLC RESIDENCE

Drawing Title
 ARCHITECTURAL SITE PLAN

Project Number 20004	Date JAN 26, 2021
Drawn Author	Checked Checker
	Designed Designer

Drawing Number
A-001

Sheet No. ___ of ___



A1 FIRST FLOOR PLAN
3/16" = 1'-0" A-101

0 2' 4' 8'
SCALE: 3/16" = 1'-0"



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Drawing Title
MAIN HOUSE - FIRST FLOOR PLAN

Project Number 20004	Date JAN 26, 2021
Drawn Author	Checked Checker
Designed Designer	

Drawing Number
A-101
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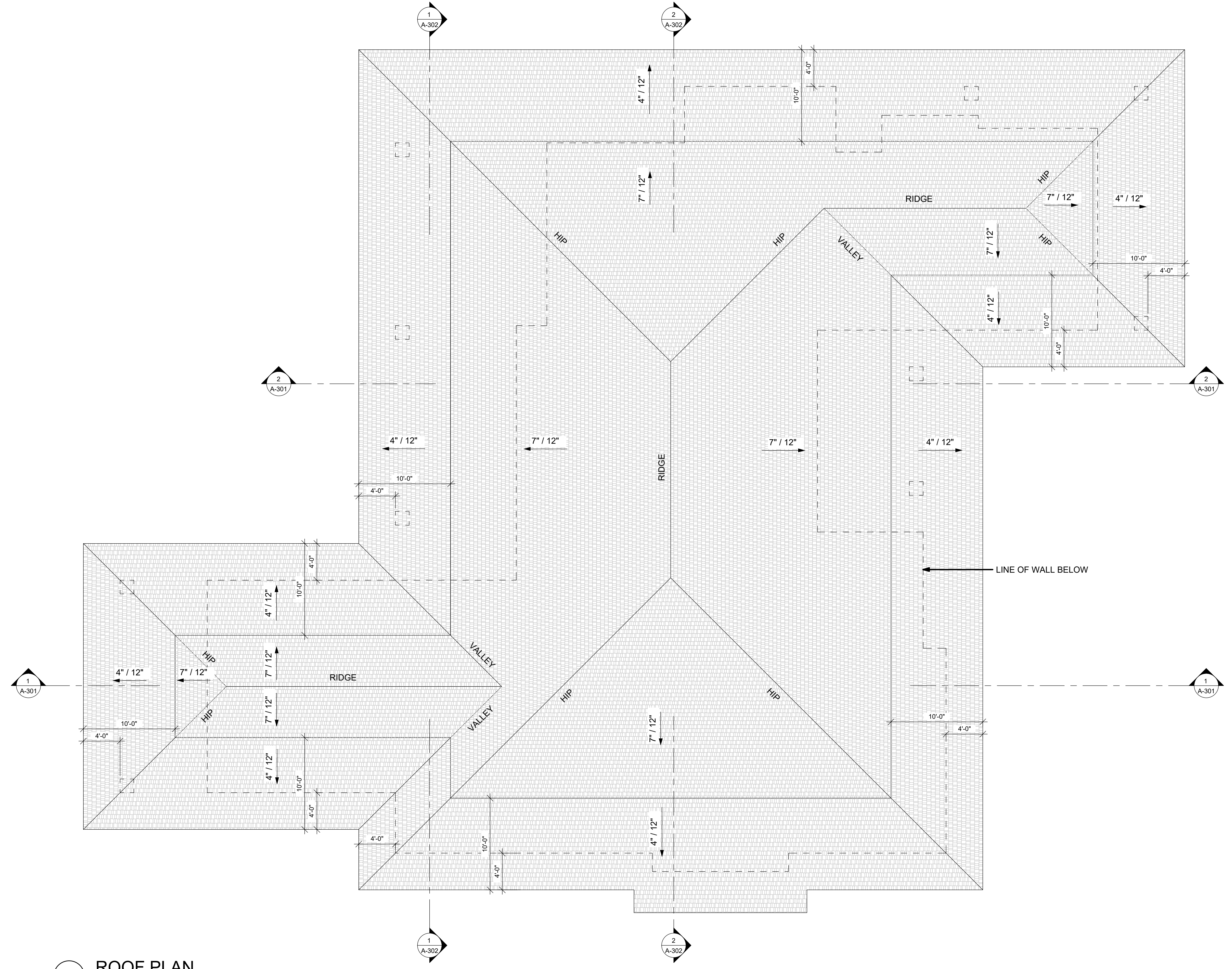
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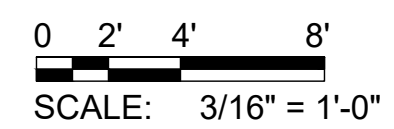
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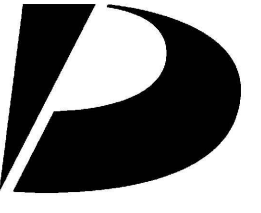
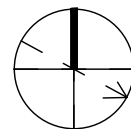
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A1 ROOF PLAN
 3/16" = 1'-0"
 A-102



PLAN NORTH



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Project Name

4439 KAHALA LLC RESIDENCE

Drawing Title

MAIN HOUSE - ROOF PLAN

Project Number

20004

Date

JAN 26, 2021

Drawn Author

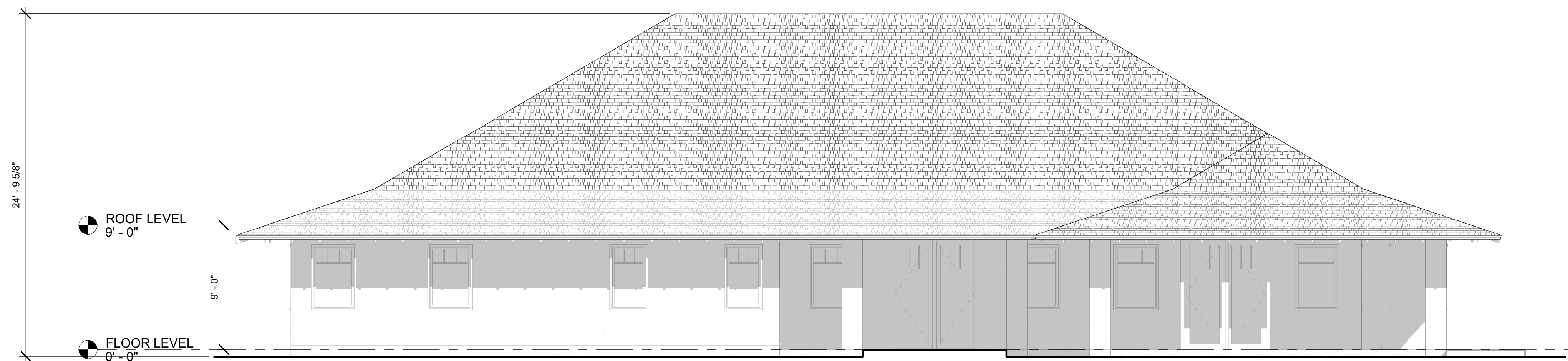
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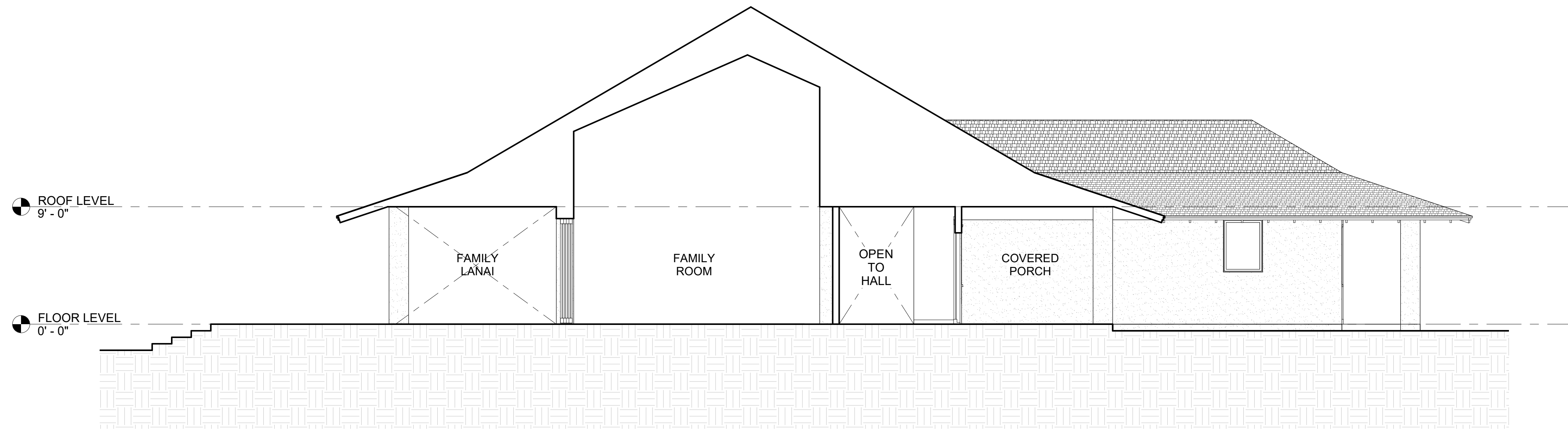
A-102

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EXTERIOR ELEVATION
4439 KAHALA LLC RESIDENCE

Scale: 3/16" = 1'-0"



BUILDING SECTIONS
4439 KAHALA LLC RESIDENCE

0 2' 4' 8'
SCALE: 3/16" = 1'-0"

Scale: 3/16" = 1'-0"

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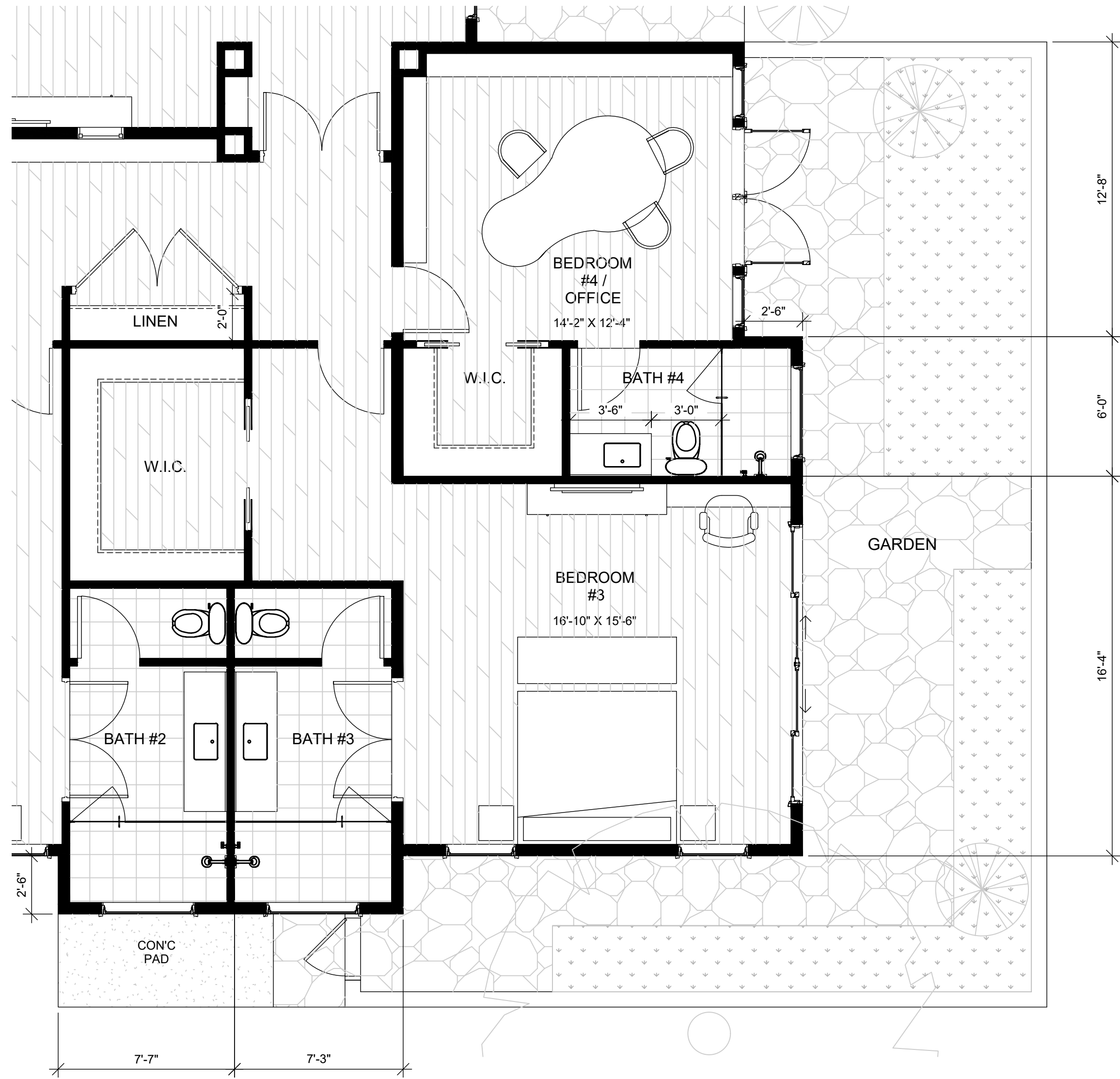
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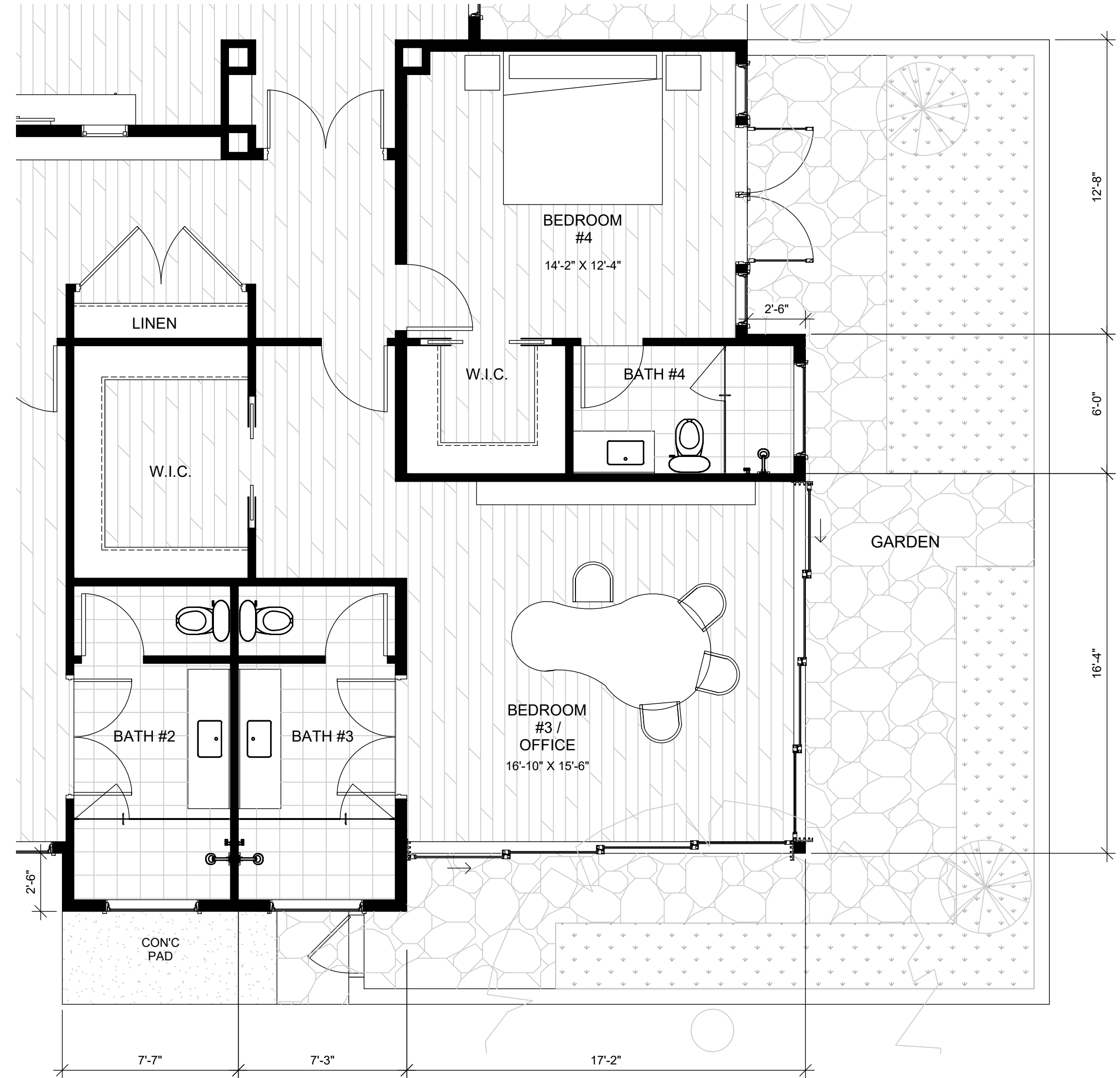
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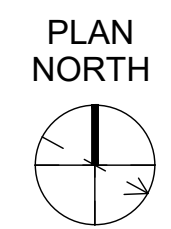


A1 FIRST FLOOR ENLARGED PLAN - OP.1
1/4" = 1'-0" A-104



A3 FIRST FLOOR ENLARGED PLAN - OP.2
1/4" = 1'-0" A-104

0 2' 4' 6'
SCALE: 1/4" = 1'-0"



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Project Name
4439 KAHALA LLC RESIDENCE

Drawing Title
MAIN HOUSE - ENLARGED PLAN

Project Number 20004	Date JAN 26, 2021
Drawn Author	Checked Checker
Designed Designer	

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A-104
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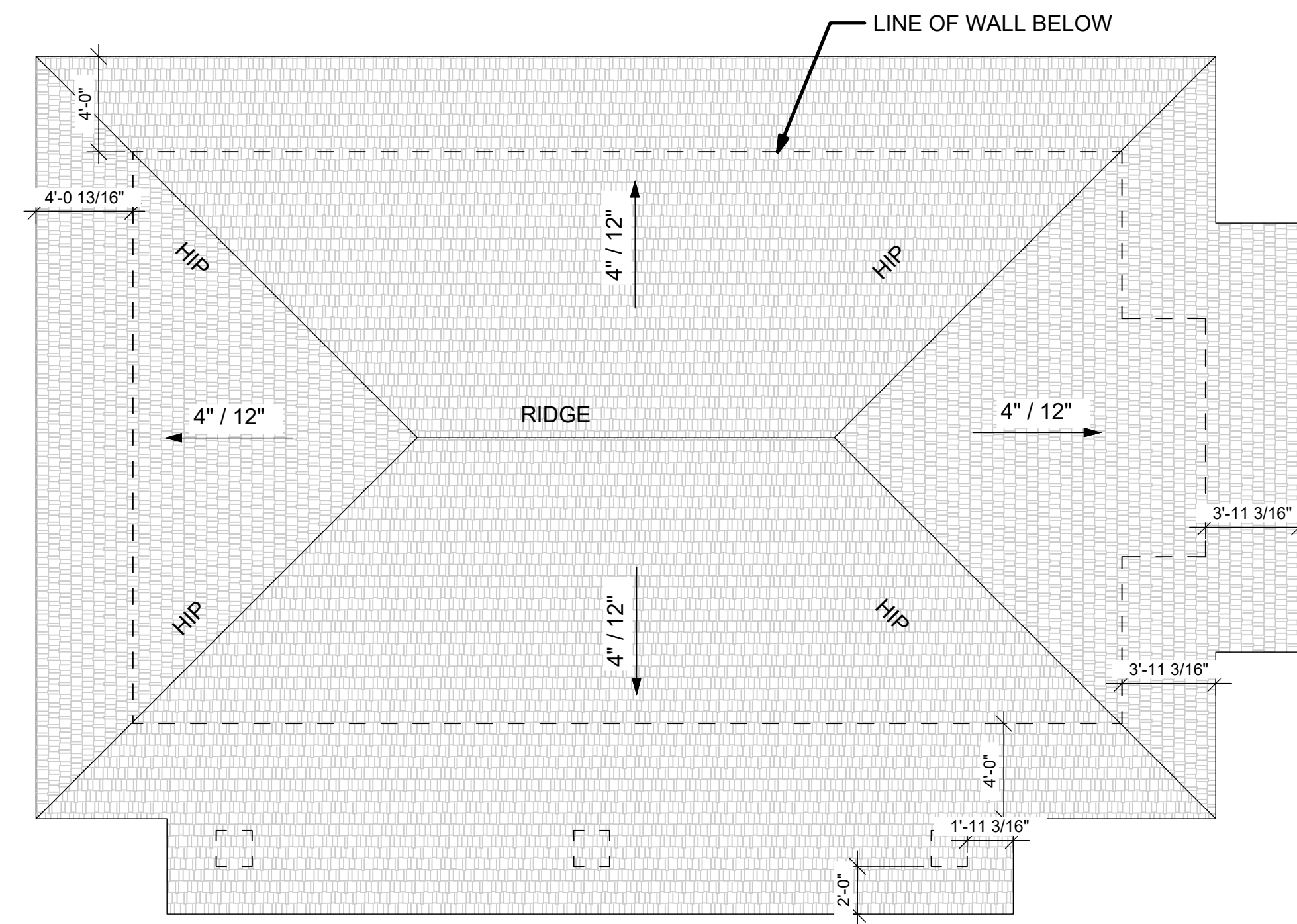
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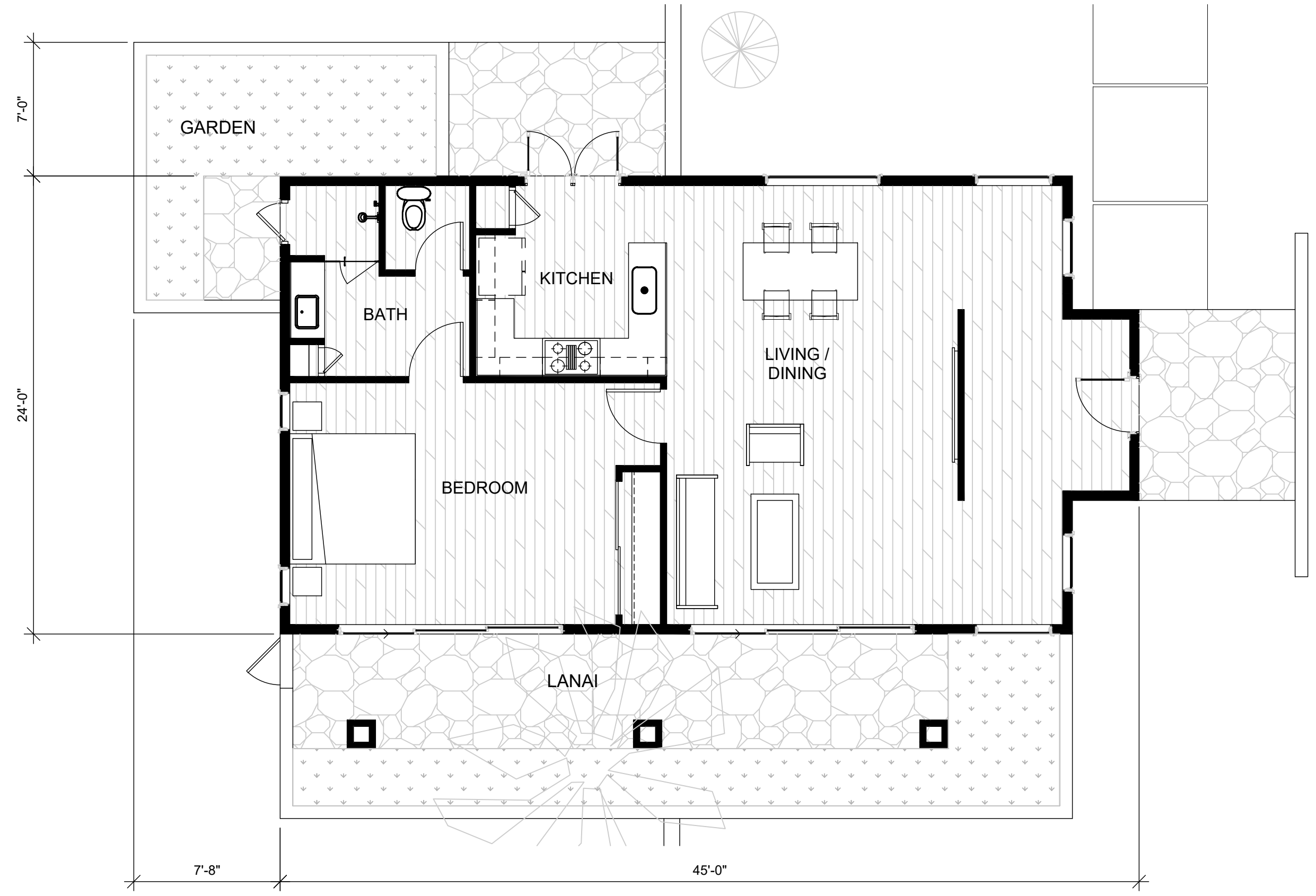
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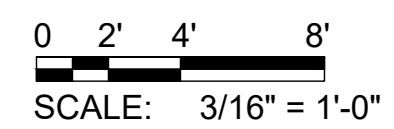
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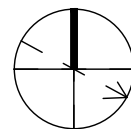
C2 ROOF PLAN
 3/16" = 1'-0" A-111



A2 FIRST FLOOR PLAN
 3/16" = 1'-0" A-111



PLAN NORTH



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Revision Number/Description

Project Name
4439 KAHALA LLC RESIDENCE

Drawing Title
 GUEST HOUSE - FIRST FLOOR PLAN AND ROOF PLAN

Project Number	Date	
20004	JAN 26, 2021	
Drawn	Checked	Designed
Author	Checker	Designer

Drawing Number

A-111

Sheet No. ___ of ___



NOVEMBER 17, 2020

4439 KAHALA AVENUE
CONCEPT MASSING





Appendix C

Archaeological Assessment

**DRAFT—Archaeological Assessment for 4439 Kāhala Ave. in
Waikīkī Ahupua‘a, Honolulu District, Island of O‘ahu,
Hawai‘i**

TMK: (1) 3-5-003:007



Prepared For:

4439 Kahala, LLC
125 Merchant St., Suite 200
Honolulu, Hawaii 96813

May 2021

Keala Pono 

Keala Pono Archaeological Consulting, LLC • PO Box 1645, Kāne‘ohe, HI 96744 • Phone 808.381.2361

**DRAFT— Archaeological Assessment for 4439 Kāhala Ave. in
Waikīkī Ahupua‘a, Honolulu District, Island of O‘ahu,
Hawai‘i**

TMK: (1) 3-5-003:007

Prepared For:

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Honolulu, Hawaii 96813

Prepared By:

Windy Keala McElroy, PhD
Kālenalani McElroy, MA
and
Max Pinsonneault, MA

May 2021



Keala Pono Archaeological Consulting, LLC • PO Box 1645, Kāne‘ohe, HI 96744 • Phone 808.381.2361

MANAGEMENT SUMMARY

An archaeological inventory survey (AIS) was conducted for proposed residential construction at 4439 Kāhala Ave. in Waikīkī Ahupua‘a, Honolulu District, on the island of O‘ahu on TMK: (1) 3-5-003:007. The survey was done in preparation for ground disturbance associated with proposed residential construction on the property. The archaeological work included a pedestrian survey that covered 100% of the project area, as well as test excavations consisting of five trenches. The property has been disturbed by modern use, and no archaeological remains were found on the surface. Likewise, no subsurface cultural features or deposits were encountered during excavation. Because of the presence of iwi kūpuna in the vicinity, archaeological monitoring is recommended for any future ground disturbance.

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INTRODUCTION

At the request of G70 on behalf of 4439 Kahala, LLC, Keala Pono Archaeological Consulting conducted an archaeological inventory survey (AIS) for proposed residential construction at 4439 Kāhala Avenue in Waikīkī Ahupua‘a, Honolulu District, on the island of O‘ahu on TMK: (1) 3-5-003:007. This work was designed to identify, document, assess significance, and provide mitigation recommendations for any historic properties that may be located in the project area in anticipation of the proposed construction.

This report is drafted to meet the requirements and standards of state historic preservation law, as set out in Chapter 6e of the Hawai‘i Revised Statutes and the *Rules Governing Standards for Archaeological Inventory Surveys and Reports*, Hawai‘i Administrative Rules (HAR) §13–276. Due to negative findings, the AIS results are presented as an archaeological assessment per HAR §13–275-5(b)(5)(A).

The report begins with a description of the project area and a historical overview of land use, Hawaiian traditions, and archaeology in the area. The next section presents methods used in the fieldwork, followed by results of the survey. Project results are summarized and recommendations are made in the final section. Hawaiian words and technical terms are defined in a glossary.

Project Location and Natural Environment

The project area is located in the residential neighborhood of Kāhala at TMK: (1) 3-5-003:007 (Figures 1 and 2), a .329 ha parcel (0.81 ac.) that is privately owned by 4439 Kahala LLC. This is located at 4439 Kāhala Avenue and is bounded by Kāhala Avenue to the north, the coastline to the south, low-density residential properties to the east, and a vacant property to the west. The project parcel is vacant, with areas of remnant concrete slab from the prior residential use, and scattered areas of non-native plants, shrubs, and weedy vegetation. The property is located within a Special Management Area (SMA).

Topography is relatively flat, and vegetation consists of landscaped grass with a few large trees. The project area lies at roughly 2.5 m (8.5 ft.) above mean sea level (amsl), and rainfall averages approximately 68 cm (27 in.) per year (Giambelluca et al. 2013). The closest fresh water source to the project is Kāhala Stream, a non-perennial watercourse that lies approximately 1.3 km (.8 mi.) to the northeast.

The leeward coastal plain of Honolulu is comprised of a series of former reef and soils, along with sediment deposits. These features include a late-Pleistocene coral reef substrate that is overlaid along the coast with calcareous marine beach sand, often with intermixed terrigenous sediments deposited from streams and nearby slope erosion. Adjacent to streams there are alluvial soils most of which have originated from weathered volcanic bedrock and then subsequently deposited during flood events. Former reef sediments (i.e., sands) are found along the coastal margin sometimes extending out onto the coastal plain (Armstrong 1983:36). Coastal terrigenous sediments originate on land, later deposited along the coastal plain and these deposits may contain materials mixed with marine sediments that include sands and larger components of the near-shore environment. The current Hawaiian shoreline configuration is the product of late and post-Pleistocene rising sea levels (Stearns 1978; Macdonald et al. 1983) followed by a mid-Holocene rise in sea level of roughly 1.5–2.0 m (4.9–6.6 ft.); and human landscape modification, much of which occurred within the past 200 years since the arrival of Europeans and Americans to Hawai‘i.

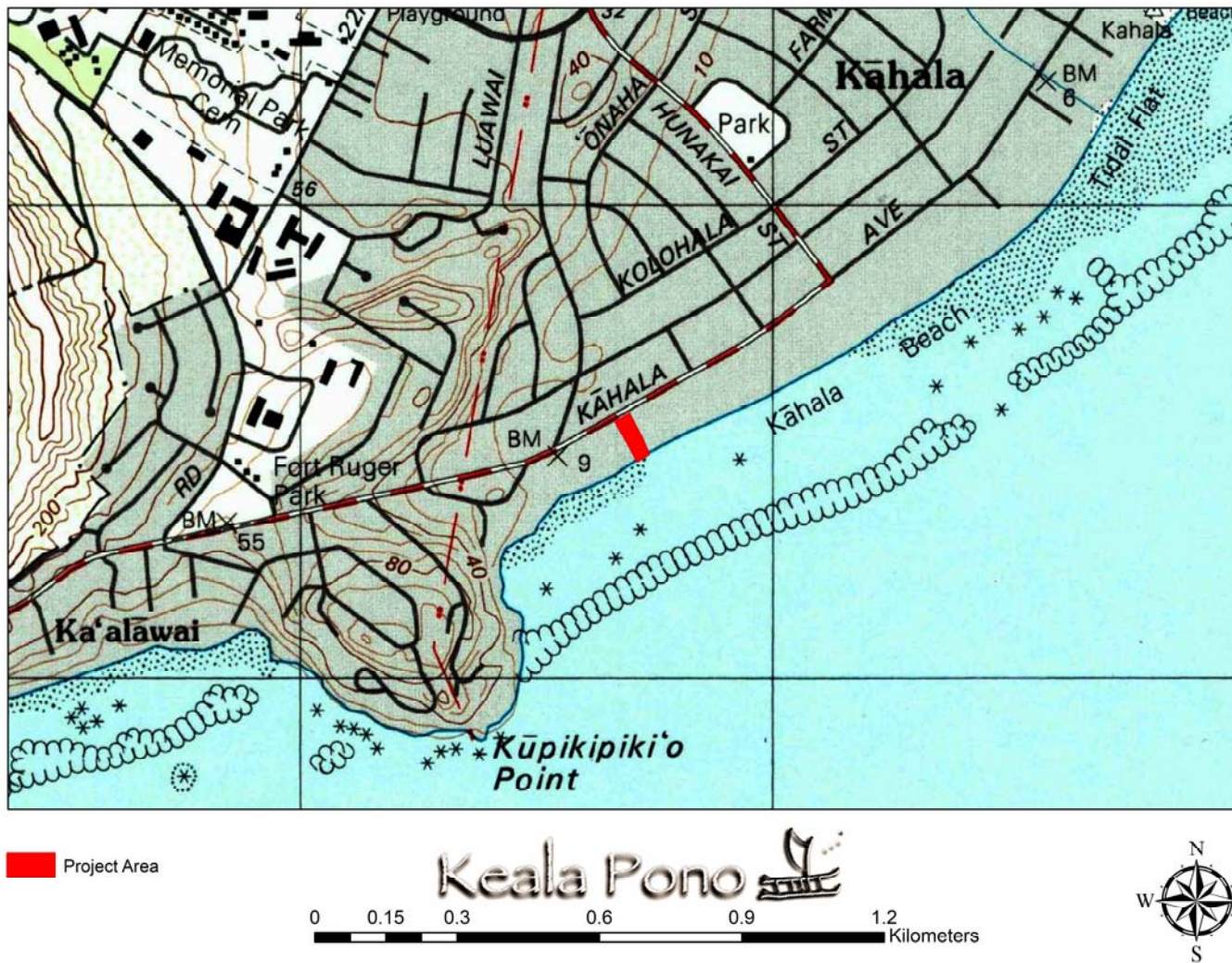


Figure 1. Project area on 7.5 minute Honolulu and Koko Head quadrangle maps (USGS 1998).



Figure 2. Project area on TMK plat map 3-5-003 (State of Hawai'i 1932).

The project area lies on Jaucas sand, 0–15% slopes (JaC) and Beaches (BS), the former occurring on the mauka half of the property and the latter on the makai half (Figure 3) (Foote et al. 1972:29). Jaucas sand is a favored environment for human burial in traditional Hawai‘i. Both soils are described in the United States Department of Agriculture Soil Survey by (Foote et al. 1972):

Jaucas sand, 0 to 15 percent slopes (JaC)

This series consists of excessively drained, calcareous soils that occur as narrow strips on coastal plains, adjacent to the ocean. They developed in wind- and water-deposited sand from coral and seashells. Permeability is rapid, and runoff is very slow to slow. The hazard of water erosion is slight, but wind erosion is a severe hazard where vegetation has been removed. Workability is slightly difficult because the soil is loose and lacks stability for use of equipment. This soil is used for pasture, sugarcane, truck crops, and urban development.

Beaches

Beaches (BS) occur as sandy, gravelly, or cobbly areas on all the islands in the survey area. They are washed and rewashed by ocean waves. The beaches consist mainly of light-colored sands derived from coral and seashell. Beaches have no value for farming. Where accessible and free of cobblestones and stones, they are highly suitable for recreational uses and resort development.

Also in the project vicinity are Ewa silty clay loam, 0–2% slopes (EmA); Coral outcrop (CR); Keaau clay, 0–2% slopes (KmA); Mamala stony silty clay loam, 0–12% slopes (MnC); Makalapa clay, 2–6% slopes (MdC); Molokai silty clay loam, 3–7% slopes (MuB); and Molokai silty clay loam, 15–25% slopes (MuD).

Project Description

The landowner is seeking to redevelop the subject property with a one-story, single family residence for a local kama‘āina family. This proposed four-bedroom home with pitched roof includes a covered lanai and three-car garage. The new home will have a floor area of approximately 4,500 square feet (sf), with a separate guest cottage of approximately 980 sf. Landscaping elements will include front and back lawns and gardens. Access will be provided by an existing driveway to Kāhala Avenue. Depths of excavation for the proposed construction are not expected to exceed 46 cm (1.5 ft.). Utilities will either be run through existing underground lines or will be laid on the surface.

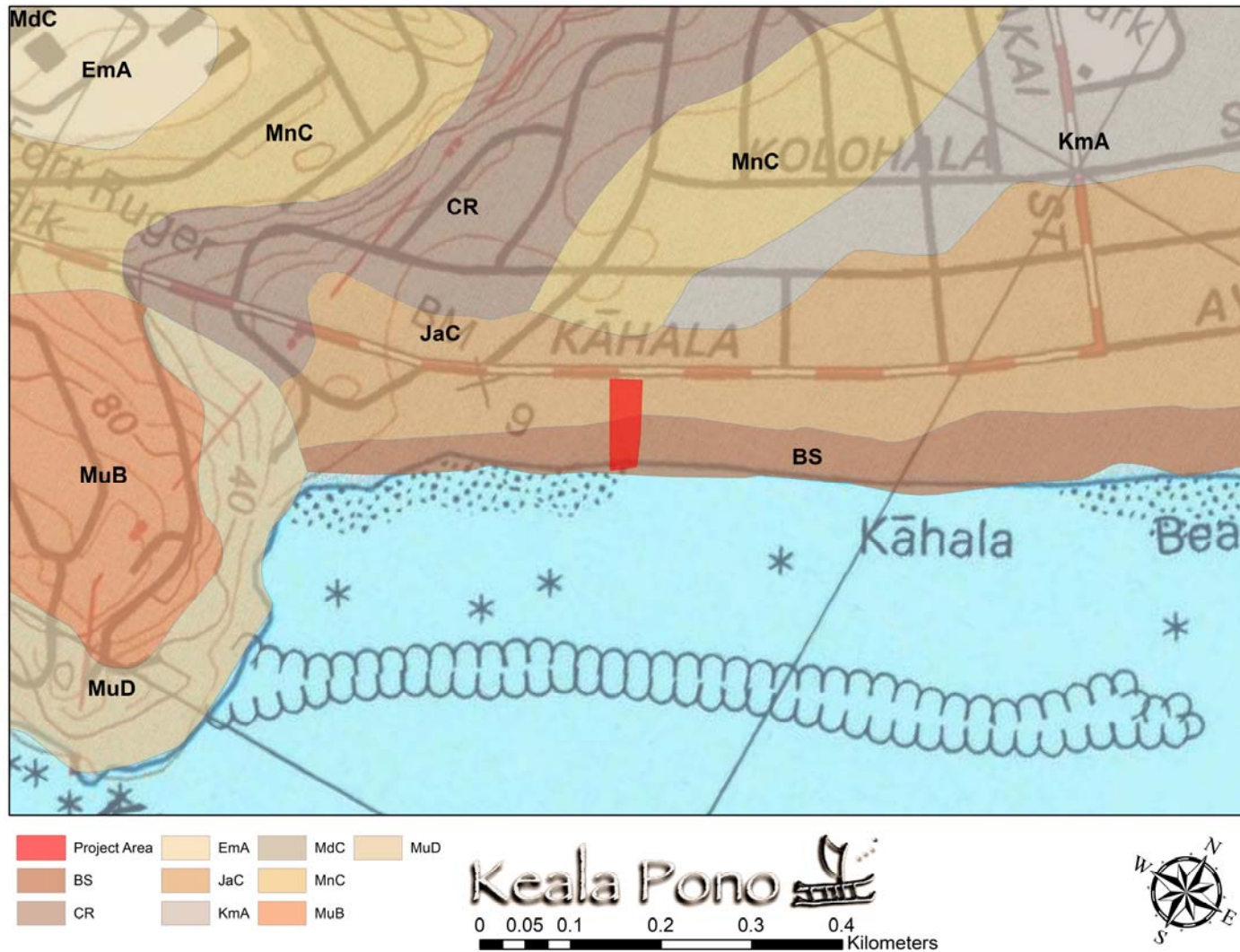


Figure 3. Soils in the vicinity of the project area (data from Foote et al. 1972).

CULTURAL BACKGROUND

This section of the report presents background information that provides context through which one can examine the cultural and historical significance of the project lands. In the attempt to record and preserve both the tangible (e.g., traditional and historic archaeological sites) and intangible (e.g., mo‘olelo, ‘ōlelo no‘eau) culture, this research assists in the discussion of anticipated finds. Research was conducted at the Hawai‘i State Library, the University of Hawai‘i at Mānoa libraries, the State Historic Preservation Division (SHPD) library, and online on the Waihona ‘Aina database and the State of Hawai‘i Department of Accounting and General Services (DAGS) and Ulukau websites. Historical maps, archaeological reports, Māhele data, and historical reference books were among the materials examined.

Wai‘alae in Traditional Times

Place names often shed light on traditional views of an area and can provide important contextual information. Hawaiian place names “usually have understandable meanings, and the stories illustrating many of the place names are well known and appreciated...The place names provide a living and largely intelligible history” (Pukui et al. 1974:xii). The project area is within the ahupua‘a of Waikīkī and the ‘ili of Wai‘alae Iki. Waikīkī translates to “spouting water” (Pukui et al. 1974:223) and was named for the swamps that made up the surrounding environment which were later drained to form the Ala Wai Canal. Wai‘alae translates to “mudhen water” while Wai‘alae Iki means “small Wai‘alae” (Pukui et al. 1974:220). The project’s neighborhood is Kāhala, which means “amberjack fish” (Pukui et al. 1974:62).

Other place names in the project vicinity are listed in the book *Place Names of Hawaii* (Pukui et al. 1974), along with the meanings of the names and/or comments about the specific locales:

Kapakahi...Gulch, Wai‘alae, Honolulu. *Lit.*, crooked. (Pukui et al. 1974:87)

Kaunuakahekili...heiau near Wai‘alae, O‘ahu. *Lit.*, the altar of Kahekili. (Pukui et al. 1974:95)

Kūpikipiki‘ō. Old name for Black Point, O‘ahu. *Lit.*, rough [sea]. (Pukui et al. 1974:125)

Lē‘ahi...Honolulu. The highest peak in Diamond Head; a variant name for Lae-‘ahi. (Pukui et al. 1974:130)

Wai‘alae Nui...land division and gulch, Honolulu. *Lit.*, large Wai‘alae. (Pukui et al. 1974:220)

Wailupe...land section...valley, gulch...peninsula...A pond here was filled in by man to form Wailupe Peninsula. *Lit.*, kite water (kites were only flown in prescribed places; this was one of them). (Pukui et al. 1974:225)

Subsistence and Traditional Land Use

Wai‘alae had an established settlement, which was observed by the American missionary Levi Chamberlain in the early historic period. Chamberlain reported on the landscape of 1828 as he traveled along the southern coast of O‘ahu, and it can be assumed that land use was similar in the pre-contact period:

At a quarter before 9 o’clock we arrived at the pleasant settlement of Waialae, distant on a straight line from Waikiki in a N.E. direction, about 4 miles, but much farther following the circuitous path along the seashore. This place is rendered agreeable by a grove of cocoanut [sic] trees and a number of branching kou trees, among which stand the grass huts of the natives, having a cool appearance, overshadowed by the waving tops of the cocoanuts, among which the trade winds sweep unobstructed. (Chamberlain 1957[1828]:28–29)

Although some of Wai‘alae’s aquatic resources came from streams and ponds, the majority were found in the bountiful coastal waters. The pelagic waters off Wai‘alae and Waikīkī were rich with deep-sea marine life. Most of the shoreline of Waikīkī was devoid of reef due to the flow of fresh water and its sediments into the sea which stifled coral growth. However, there was a healthy reef system growing at the eastern end of Waikīkī fronting Kapi‘olani Park and Lē‘ahi, extending around the point to Wai‘alae. These provided a good variety of reef fishes. In addition, the entire coast offered many other types of edible marine resources such as crabs, shellfish, and limu (Kanahele 1995).

To supplement their marine diet, the Hawaiians made use of inland ponds. Some ponds were near the shore, separated from the sea by sand dunes, but connected to the sea through an ‘auwai; these were called loko pu‘uone. Other ponds were further inland and only fed by freshwater streams or springs; these were called loko wai. These ponds were modified, stocked, and maintained through the ingenuity of the people. They added to their waters such things as mākāhā, or sluice gates, paniwai, or dams, kahe, or fish traps, and umu, or man-made fish shelters. Ko‘a were also erected near these water resources and dedicated to the god Kū‘ula to ensure an abundant harvest of fish (Kanahele 1995).

Multiple sources indicate that springs in the area gave Wai‘alae its name, and these were located near what is now Kalaniana‘ole Highway. These springs were clearly prized among the local inhabitants, who took great care in protecting and maintaining the water resources.

Waialae Springs. From which Waialae derived its name. It supplied water for the chiefs from olden times. The location had been lost for many years. During a tour of the island by Kamehameha III, the King became thirsty and inquired of an old couple who were living at Waialae where he could get some water to drink. It happened that the ancestors of these old people were the keepers of this water hole, and the duty descended to them. They said that the only reason they stayed there was so that when the King stopped there they might carry out their duty and reveal the location to him. This hole was covered with pohuehue [morning glory] and under the pohuehue was a large slab of stone covering the water. (Sterling and Summers 1978:275)

Handy discusses the importance of the water resources for cultivation in the upper reaches of Wai‘alae:

The ahupua‘a takes its name from the stone-incased spring, which may be seen today just above the highway. From the spring runs a stream which watered terraces that are now largely covered with grass raised for dairying and by the golf links. Three moderate sized gulches having streams of constant flow are included in this ahupua‘a. In the lower portion of one of these gulches which was examined no terraces were seen. According to Mr. A.F. Judd, some seaward holdings in Waialae had inland plots (lele) located in Palolo.” (Handy 1940 in Sterling and Summers 1978:275)

A local Wai‘alae resident, J.K. Mokumaia, related a story in 1920 of the importance surrounding the Wai‘alae Iki spring:

Many people lived along the shores and they worked at farming and fishing. Plants grew. There were taro patches, tobacco, sweet potatoes, bananas and sugar cane. Paki was Waialae-nui’s konohiki of fishing; Kamamalu was Waialae-iki’s konohiki of fishing. There were ever so many people on the shore when these chiefs came to spend a while with the common people. Here your scout looked at everything that he was told of. There was the pool that Kamamalu used to bathe in. I went to see its beauty for myself. There are two springs, one is on the summit of Waialae-nui and the other is on Waialae-iki. These appear to be good sites, there is much water, but its beauty at the time of the konohikis is gone. Now the kapu is freed and the kapu places are trodden underfoot. (*Ka Nupepa Kuokoa* 1920 in Sterling and Summers 1978:275)

Another aquacultural innovation was the loko i‘a kalo, or taro fishponds. These were ponds in which fish were raised, but they also served the purpose of growing kalo. The latter purpose probably took the forefront since

kalo was culturally and spiritually significant in Hawaiian cosmology, and kalo was the main starch in the Hawaiian diet. The marshy environment of Waikīkī was perfectly suited for the conditions essential to the cultivation of wetland kalo, and an estimated 20 acres of Waikīkī's marshlands were planted in kalo. Some of these wetland kalo fields continued their operation well into the 19th century (Kanahele 1995).

Besides kalo, the original inhabitants of Waikīkī cultivated 'uala, grew ipu for containers, and cultivated wauke for clothing. In addition, the ahupua'a of Waikīkī provided various ferns and berries for food; pili grass for house thatching; hau for cordage, clothing, canoe making, and for igniting fires; mamaki for cloth; naio for timber; kukui for food, medicine, and lamp oil; lama, 'ōhi'a 'ai and uhiuhi for timber; 'olonā for cordage; 'ie'ie for weaving; and 'ōhi'a lehua for house building and weapon making (Kanahele 1995). Clearly, the natural environment of Waikīkī was a place that easily furnished a large community with all the necessities for survival. Kāhala in particular was noted for its groves of hala trees (Handy et al. 1991:200).

The famed historian John Papa 'Ī'ī reminds us that there was a well-known, well-traveled network of trails that crisscrossed O'ahu connecting east to west and north to south (Figure 4). Of the famous trail which traversed Waikīkī, 'Ī'ī elucidates:

The trail from Kawaiahao which led to lower Waikiki went along Kaananiau, into the coconut grove at Pawaa, the coconut grove of Kuakuaka, then down to Piinaio; along the upper side of Kahanaumaikai's coconut grove, along the border of Kaihikapu pond, into Kawehewehe; then through the center of sandy beach of Ulukou to Kapuni, where the surfs roll in; thence to the stream of Kuekaunahi; to Waiaula and to Paliiki, Kamanawa's house site. The latter was named for the Paliiki in Punahoa, Hilo. Perhaps that was where Kamanawa lived when the king resided in Hilo during the battle called Puana, prior to the building of the great peleleu fleet. From Palikki the trail ran up to Kalahu, above Leahi, and on to the place where the Waialae stream reached the sand. ('Ī'ī 1959:92)

Mo'olelo

As mentioned earlier, Hawaiian place names were connected to traditional stories through which the history of the places was preserved. These stories were referred to as "mo'olelo, a term embracing many kinds of recounted knowledge, including history, legend, and myth. It included stories of every kind, whether factual or fabulous, lyrical or prosaic. Mo'olelo were repositories of cultural insight and a foundation for understanding history and origins, often presented as allegories to interpret or illuminate contemporary life...Certainly many such [oral] accounts were lost in the sweep of time, especially with the decline of the Hawaiian population and native language" (Nogelmeier 2006:429–430). Still, many traditional stories managed to be recorded as Hawaiian society transitioned from an oral culture to a written one, and among those chronicled were several versions of stories connected to Waikīkī Ahupua'a.

The Supernatural Owls of Kupalaha Heiau

The heiau called Kupalaha at today's Cunha Beach, is intimately connected to a supernatural battle against owls in the days of old. As a result of this battle, the O'ahu chief Kakuhihewa pardoned the life of the man named Kapoi who built Kupalaha. The noted ethnographer Martha Beckwith shared this story concerning Kupalaha Heiau in her documentation of Hawaiian mythology.

A famous Oahu owl story is that of the owl war carried on in behalf of a man named Kapoi who, having robbed an owl's nest, took pity on the lamenting parent and returned the eggs. He then took the owl as his god and built a heiau [Kupalaha Heiau] for its worship. The ruling chief Kakuhihewa, considering this an act of rebellion, ordered his execution but at the moment of carrying out the order

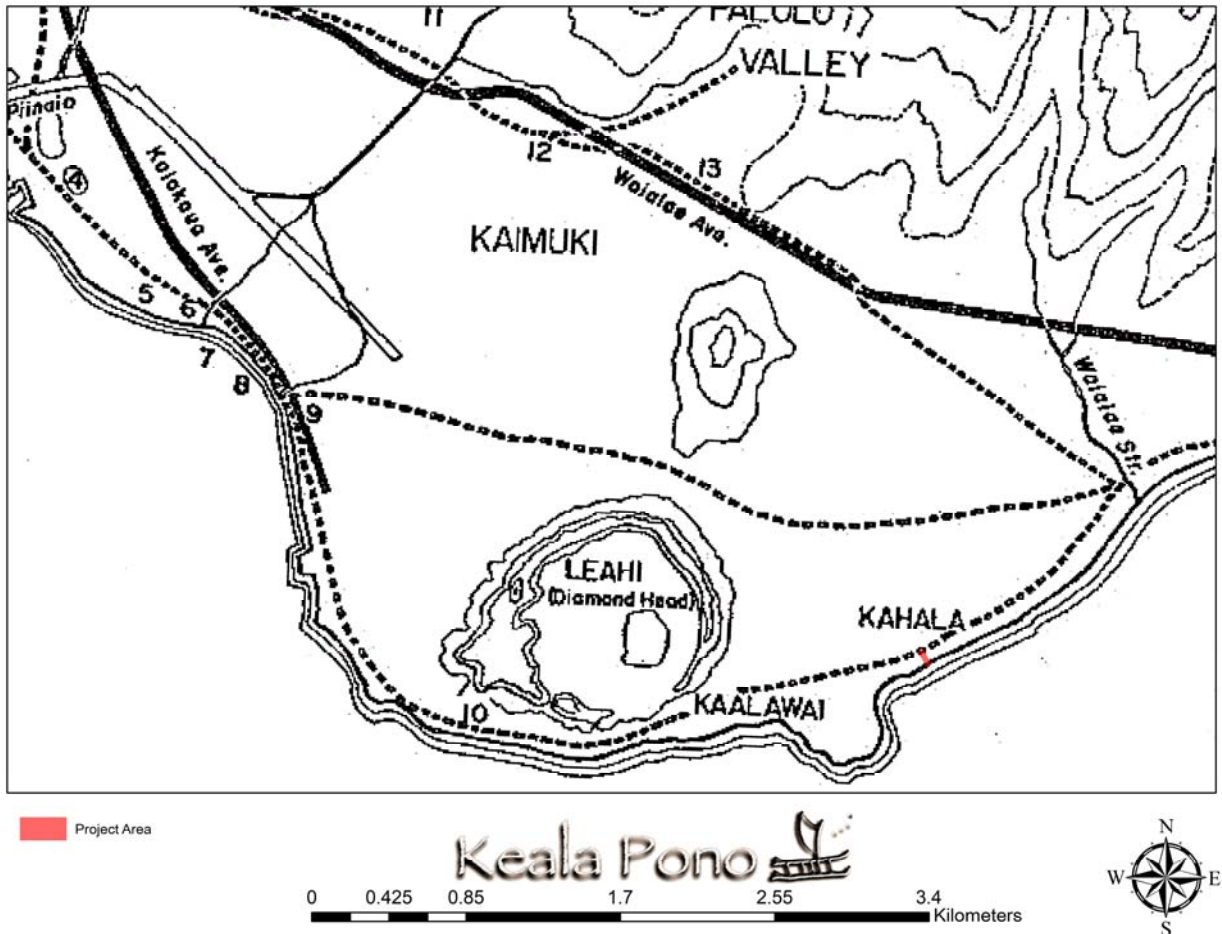


Figure 4. Trails in the vicinity of the project area (‘I‘i 1959:93).

the air was darkened by flying owls who had come to his protection. The places on Oahu where the owls made rendezvous for this battle are known today by the word pueo (owl) in their names, such as Kala-pueo east of Diamond Head, Kanoni-a-ka-pueo in Nu‘uanu valley, Pueo-hulu-nui near Moanalua. The scene of the battle at Waikiki is called Kukaeunahio-ke-pueo (Confused sound of owls rising in masses). (Beckwith 1970:124–125)

Chief Kakuhihewa was just one of many ali‘i connected to Waikīkī through mo‘olelo. One of the first ali‘i mentioned as being connected to Waikīkī was Kalamakua-a-Kaipuholua. He was the chief who built the grand taro fields of Ke‘okea, Kualulua, and Kalamanamana and others in Waikīkī. Kalamakua-a-Kaipuhola married the skilled surfing chiefess Kelea-nui-noho-‘ana-‘api‘api. Their daughter La‘ie-lohelohe was born in Waikīkī at Helumoa and raised there at Kaluaokau. La‘ie-lohelohe later married the famed Maui chief Pi‘ilani, and this marriage solidified the ties between Waikīkī and Maui. The son of La‘ie-lohelohe and Pi‘ilani was Kiha-a-Pi‘ilani, an heir to the Maui chiefdom. He was raised in Waikīkī by a kahuna at Mau‘oki Heiau (Kamakau 1991).

‘Ōlelo No‘eau

In 1983, Mary Kawena Pukui published a volume of close to 3,000 ‘ōlelo no‘eau that she collected throughout the islands. The introductory chapter reminds us that if we know these proverbs and wise sayings well, then we will know Hawai‘i well (Pukui 1983). Although no ‘ōlelo no‘eau were found specifically for Kāhala or Wai‘alae, several are known for Waikīkī. Here are the traditional sayings from Puku‘i’s book which mention Waikīkī:

(27) Aia aku la paha i Waikīkī i ka ‘imi ‘ahu‘awa.

Perhaps gone to Waikīkī to seek the ‘ahu‘awa sedge.

Gone where disappointment is met. A play on *ahu* (heap) and *‘awa* (sour).

(110) Alia e ‘oki ka ‘āina o Kahewahewa, he ua.

Wait to cut the land of Kahewahewa, for it is raining.

Let us not rush. Said by Kaweloleimakua as he wrestled with an opponent at Waikīkī.

(285) E ho‘i i ka u‘i o Mānoa, ua ahiahi.

Let the youth of Mānoa go home, for it is evening.

Refers to the youth of Mānoa who used to ride the surf at Kalehuawehe in Waikīkī. The surfboards were shared among several people who would take turns using them. Those who finished first often suggested going home early, even though it might not be evening, to avoid carrying the boards to the *hālau* where they were stored. Later the expression was used for anyone who went off to avoid work.

(1378) Ka i‘a pīkoi kānaka o Kālia; he kānaka ka pīkoi, he kanaka ka pōhaku.

The fish caught by the men of Kālia; men are the floaters, men are the sinkers.

In ancient days, when a school of mullet appeared at Kālia, O‘ahu, a bag net was set and the men swam out in a row and surrounded the fish. Then the men would slap the water together and kick their feet, driving the frightened fish into the opening of their bag net. Thus the fishermen of Kālia became known as human fishnets.

(1463) Ka makani kā‘ili aloha o Kīpahulu.

The love-snatching wind of Kīpahulu.

A woman of Kīpahulu, Maui, listened to the entreaties of a man from O‘ahu and left her husband and children to go with him to his home island. Her husband missed her very much and grieved. He mentioned his grief to a *kahuna* skilled in *hana aloha* sorcery, who told the man to find a container with a lid. The man was told to talk into it, telling of his love for his wife. Then the *kahuna* uttered an incantation into the container, closed it, and hurled it into the sea. The wife was fishing one morning at Kālia, O‘ahu, when she saw a container floating in on a wave. She picked it up and opened it, whereupon a great longing possessed her to go home. She walked until she found a canoe to take her to Maui.

(1493) Ka nalu ha‘i o Kalehuawehe.

The rolling surf of Kalehuawehe.

Ka-lehua-wehe (Take-off-the-*lehua*) was Waikīkī’s most famous surf. It was so named when a legendary hero took off his *lei* of *lehua* blossoms and gave it to the wife of the ruling chief, with whom he was surfing.

(1772) Ke one ‘ai ali‘i o Kakuhihewa.

The chief-destroying sands of Kakuhihewa.

The island of O‘ahu. When the priest Ka‘opulupulu was put to death by chief Kahāhana for warning him against cruelty to his subjects, he uttered a prophecy. He predicted that where his own corpse would lie in a *heiau* in Waikīkī, there would lie the chief’s corpse as well. Furthermore, he said, the land would someday go across the sea. This was felt to be a curse. When Kamehameha III was persuaded by a missionary friend to move the capital from Lahaina to O‘ahu, a *kahuna*, remembering the curse, warned him not to, lest the monarchy perish. The warning was ignored, and before the century had passed, the Kingdom of Hawai‘i was no more.

(1776) Ke one kuilima laula o ‘Ewa.

The sand on which there was a linking of arms on the breadth of ‘Ewa.

‘Ewa, O‘ahu. The chiefs of Waikīkī and Waikele were brothers. The former wished to destroy the latter and laid his plot. He went fishing and caught a large *niuhi*, whose skin he stretched over a framework. Then he sent a messenger to ask his brother if he would keep a fish for him. Having gained his consent, the chief left Waikīkī, hidden with his best warriors in the “fish.” Other warriors joined them along the way until there was a large army. They surrounded the residence of the chief of Waikele and linked arms to form a wall, while the Waikīkī warriors poured out of the “fish” and destroyed those of Waikele.

Wind and Rain Names

With their lives closely connected to the natural environment and physical surroundings, Hawaiian winds and rains were individually named and associated with a specific place, region, or island. In *Hānau Ka Ua*, Akana and Gonzales (2015:xv) explain that kūpuna “knew when a particular rain would fall, its color, duration, intensity, the path it would take, the sound it made on the trees, the scent it carried, and the effect it had on people.” The following wind and rain names associated with the project region offer further insight on kūpuna perspectives of the project area.

A wind recorded for Kāhala is ‘Ōlau-niu. This translates to “coconut-leaf piercing” (Nakuina 2005).

Although no rain names were found specifically for Kāhala or Wai‘alae, two are associated with Waikīkī. These are Makahuna and Wa‘ahila (Akana and Gonzales 2015). Both rains were recorded in mele:

Ku‘u kane i ka makani Hauālia	My husband of the Hauālia wind
‘O ka Makahuna i Hāwāwā ē	The Makahuna rain at Hāwāwā
Wā ihola , ke wā wale maila nō	Boisterous, making an uproar
Ka ua hilahila moe awakea	The shy rain that settles down at midday

From a mele by Hi‘iakaikapoliopole on hearing the clamor of people in the house she has just left in Waikīkī. (Akana and Gonzales 2015:170)

Ku‘u kane i ka ua noe	My husband of the misty rains
Noe hāli‘i a ka Wa‘ahila	Blanketing fall of the Wa‘ahila showers
Ho‘ohila ka mana‘i, wehi i ka lau	Abashed, yet adorned by the outpour
Lau a ke aloha e pi‘i ana i ka liko	An outpouring of love, rising to brightness

Wā ihola, ke wā wale maila nō Boisterous, an uproar

From a mele by Hi'iakaikapoliopole as she was leaving a house with noisy people playing the game of kilu in Waikīkī. (Akana and Gonzales 2015:280)

A well-known person in Hawaiian oral traditions is the demigod Kamapua'a. He was a legendary figure from O'ahu who could assume the shapes of various plants and animals, most notably a pig. In the story of Kamapua'a published in 1891 in the Hawaiian language newspaper *Ka Leo o ka Lahui*, Kamapua'a utters a chant which mentions the wind and rain of Waikīkī by name. He tells us that the wind belonging to Kapua, an ancient well-known surf spot near present-day Kapi'olani Park, is called Hauāliaia. Kamapua'a then indicates that the rain belonging to Waikīkī is called Wa'ahila:

Oli aku la o Kamapuaa:	Kamapua'a chanted:
... He Hauāliaia ko Kapua	... Kapua has the Hauāliaia [breeze]
He ua Waahila ko Waikiki	Waikīkī has the Wa'ahila rain
He ua Kukalahale ko Honolulu...	Honolulu has the Kūalahale rain...(Akana 2004:13, 16-17)

Power and Warfare in Waikīkī

There are many O'ahu chiefs connected to Waikīkī. Some of the most noted are Mā'ilikūkahī, Ka'ihikapuamanuia, Kakuhihewa, Ka'ihikapuakakuhikewa, and Kahahana. Sometime around the start of the 15th century, Mā'ilikūkahī was born at the sacred birthing place in Wahiawā known as Kukaniloko. When Mā'ilikūkahī was 29 years old, he was chosen by the ali'i, kahuna, and maka'āinana to become O'ahu's king. He consented and moved to Waikīkī, making it his administrative center. Mā'ilikūkahī was well-loved because he ruled with compassion and wisdom as heard in his decree:

Cultivate the land, raise pigs and dogs and fowl, and take the produce for food. And you, chiefs of the lands, do not steal from others or death will be the penalty. The chiefs are not to take from the maka'āinana. To plunder is to rebel; death will be the penalty. This is my command to the chiefs, the lesser chiefs, the warrior chiefs, the warriors, and the people: all the first-born sons, the keiki makahiapo, are to be mine to raise; they will be my sons, ka'u keiki, and mine to take care of. (Kamakau 1991:55)

Many generations after Mā'ilikūkahī, Ka'ihikapuamanuia became the ruler of Waikīkī, and like Mā'ilikūkahī, Ka'ihikapuamanuia was well-liked by the people. Ka'ihikapuamanuia built the heiau in Waikīkī called Hale Kumuka'aha, and shortly thereafter laid plans to kill his brother Ha'o who was the chief at Waialeale in 'Ewa. After Ka'ihikapuamanuia carried out his plans of murdering his brother, there was a dividing of O'ahu into two chiefdoms. Out of Waikīkī, Ka'ihikapuamanuia continued ruling the districts of Kona, Ko'olaupoko and his brother's former stronghold of 'Ewa. Ha'o's son Napulanahumahiki, who escaped to Wai'anae after his father's murder, became O'ahu's other chief, ruling the districts of Wai'anae, Waiālua, and Ko'olauloa (Kamakau 1991).

Upon the death of Ka'ihikapuamanuia, his warrior son Kakuhihewa assumed power. Kakuhihewa's daughter Kaeaakalona married the rival chief Napulanahumahiki of Wai'anae, and once again, O'ahu became one united kingdom under Kakuhihewa. The reign of peace and prosperity that Kakuhihewa brought to the kingdom of O'ahu marked him as the greatest of Mā'ilikūkahī's descendants and gave O'ahu the nickname of "The Sands of Kakuhihewa." This period is described as follows:

Conditions in the kingdom in the mid-1500s were excellent. Agricultural and fishing industries were thriving. Food was abundant and the people were healthy. The prosperous economy attracted chiefs from Maui, Hawai'i and Moloka'i who came to O'ahu to live or to enjoy the excitement and brilliance of the court. Chiefs from the island of Hawai'i also came to escape their own interminable wars. (Kanahele 1995:73)

When Kakuhihewa died, his oldest son Kanekapuakakuhihewa became the ruler, and this new king shared the monarchy over O‘ahu with his three brothers. One of the four brothers, Ka‘ihikapuakakuhihewa, ensured that the kingdom of O‘ahu continued to be administered from Waikīkī as well as ‘Ewa. Unlike previous generations, the four brothers did not succumb to intrafamily conflict, and as a result they brought five generations of continued peace to O‘ahu. Their only challenge came from the outside when the Maui chief Kauhikama invaded O‘ahu at Waikīkī. The invading Maui ruler was routed, and he was offered up at the heiau ‘Āpuakēhau in Waikīkī (Kanahale 1995).

A little over a century later, the last of O‘ahu’s sovereign chiefs was Kahahana. Although Kahahana was born on O‘ahu, he was raised by his uncle, the chief of Maui, Kahekili. Since the people of O‘ahu had been mistreated by their ruler Kumuhana, the O‘ahu chiefs deposed Kumuhana and summoned Kahahana from Maui to be their new ruler. Kahahana accepted and sailed for O‘ahu where he was greeted with rejoicing when he landed on the Waikīkī shores of Kahaloa, an area between today’s Halekulani and Royal Hawaiian Hotels. Kahahana had his residence at Helumoa in Waikīkī as did the future rulers Kahekili and Kamehameha I (Feeser 2006). For a while, Kahahana was a well-loved chief, and much of his good leadership was attributed to the guidance of his high priest Ka‘opulupulu. However, Kahahana’s uncle Kahekili had coveted the O‘ahu kingdom, and he wrongfully convinced Kahahana that Ka‘opulupulu was a traitor. As a result, Kahahana killed his high priest and presented him on the sacrificial altar of the heiau at Helumoa (Pukui 1983:44). As soon as Kahekili learned that the wise priest was dead, he set out to invade and conquer O‘ahu. Kahekili and his army from Maui landed their war canoes on the shores of Waikīkī, covering the entire coast from Ka‘alawai near today’s Diamond Head to Kawehewehe near the present Halekulani Hotel. After three years of fighting, Kahekili finally subdued the forces of Kahahana, and the sovereignty of the O‘ahu kingdom was no more. The year was 1783, and by that time, the Western explorers had also already arrived on O‘ahu’s shores (Kanahale 1995). Thus ended one chapter of O‘ahu’s history and started a new one toward the modern era.

Waikīkī and Wai‘alae in the Historic Era

Since the arrival of Westerners to Hawai‘i in the late 1700s, perhaps no other village in the islands epitomizes the transformation of Hawai‘i as well as Waikīkī does. At the time of contact, Waikīkī was the center of rule for the independent O‘ahu kingdom under Kahahana. Waikīkī remained a seat of political administration even under Kahekili, the chief from Maui who wrested control from Kahahana, and it continued to be the seat of rule for the completely unified Hawaiian Kingdom under Kamehameha, who conquered Kahekili. After little more than a decade of ruling from Waikīkī, Kamehameha moved the seat of government to Honolulu, but Waikīkī continued to be a place of royal residences, surf spots, and temples.

Māhele Land Tenure

The change in the traditional land tenure system in Hawai‘i began with the appointment of the Board of Commissioners to Quiet Land Titles by Kamehameha III in 1845. The Great Māhele took place during the first few months of 1848 when Kamehameha III and more than 240 of his chiefs worked out their interests in the lands of the Kingdom. This division of land was recorded in the Māhele Book. The King retained roughly a million acres as his own as Crown Lands, while approximately a million and a half acres were designated as Government Lands. The Konohiki Awards amounted to about a million and a half acres, however title was not awarded until the konohiki presented the claim before the Land Commission.

In the fall of 1850 legislation was passed allowing citizens to present claims before the Land Commission for parcels that they were cultivating within the Crown, Government, or Konohiki lands. By 1855 the Land Commission had made visits to all of the islands and had received testimony for about 12,000 land claims. This testimony is recorded in 50 volumes that have since been rendered on microfilm. Ultimately between 9,000 and 11,000 kuleana land claims were awarded to kama‘āina totaling only about 30,000 acres and recorded in ten large volumes.

Abner Pākī was awarded the ‘ili of Wai‘alae Iki and after his death, John ‘Ī‘ī inherited the lands. Victoria Kamāmalu was awarded the ‘ili of Wai‘alae Nui in 1848 and after her death, Bernice Pauahi Bishop inherited the lands. Kamāmalu’s claim also included a lele of Wai‘alae Nui located within Wai‘alae Iki, which comprised Wai‘alae Spring and the surrounding lo‘i.

One LCA was awarded that encompasses the project area, LCA 228:2, known as Kānewai-Kahala (see Figure 10). It was awarded to Kalaiheana (also spelled Kaleiheiana), a kahu of King Kamehameha II (Kamakau 1992:220, 268). According to LCA documentation, the property consisted of one house lot, one lo‘i, a road/path, and a wall/fence. John ‘Ī‘ī was retained as a witness for Kalaiheana’s claim. ‘Ī‘ī indicated:

...Kalaiheana’s land, called Kanewai, is at Waikiki. It has some leles in Manoa...and the lele of Pahoa at Waikiki; and the sea of Kahala. That was the land of Keeaumoku at Waikiki, adjoining the north side of Kalaepohaku. This land became his upon the victory of Kamehameha I at the Battle of Nuuanu, also Waialua, as was the custom of granting land to chiefs at that time. When the peleleu came, the land passed from Keeaumoku to Papa and Kalaiheana, and all the leles were also conveyed. From thence came this acquisition and there was no deterrent until the year 1841. For the first time, an edge of Kahala as taken for Waialae. And in the year 1846 another portion was taken for Kalaepohaku...(LCA 228:2)

After the death of Kalaiheana in 1855, John ‘Ī‘ī inherited his lands in Kānewai, as he was the guardian to Victoria Kamāmalu. After the death of Kamāmalu, the lands were then bequeathed to Bernice Pauahi Bishop.

Economic Pursuits of the Late Historic Era

The 1800s brought whalers, sandalwood traders, and Protestant missionaries to Waikīkī’s doorstep. The foreigners brought with them new diseases for which Hawaiians had no immunity, and as a result, there was a rapid depopulation of Waikīkī and throughout Hawai‘i. Waikīkī’s once-thriving lo‘i kalo and loko i‘a would decline severely.

Agricultural endeavors across O‘ahu were prevalent through the 1800s, with some more profitable than others, and dependent largely on the regional environment and surrounding resources. By the late 19th century, the sugar industry in Hawai‘i had reached its economic high. There was only one sugar plantation recorded in the Wai‘alae area, Niu Sugar Plantation, and according to Thomas Thrum’s 1881 edition of *The Hawaiian Almanac and Annual*, J.C. White was Niu Plantation’s operations manager (Thrum 1881:57). There was no other mention of Niu Plantation in Thrum’s subsequent annuals, which may indicate that the endeavor did not last. By the 20th century, the former taro lands in and around Wai‘alae were converted into farming communities of immigrant Chinese farmers with fruits, vegetables, and rice among the crops that were cultivated.

Ranching was brought to Wai‘alae by Daniel Paul Rice Isenberg, the son of German-born businessman Paul Isenberg, who was a co-founder of H. Hackfeld & Co. and a manager of the Līhu‘e Sugar Plantation. For a time, Daniel Isenberg managed the Līhu‘e Plantation before moving to O‘ahu, and leasing land in Wai‘alae from the Bishop Estate. There, he established a dairy ranch where he also promoted horse racing and bred horses. In his years on O‘ahu he was highly active in local business enterprises and politics. He was also known as “Paulo Liilii” and was close to King Kalākaua, who would often be present at lūaus hosted by Isenberg at his Wai‘alae ranch. Isenberg also founded the first dairyman’s association, the first baseball team, and baseball association. After the annexation of Hawai‘i, Isenberg became highly involved in politics and he was elected to the house of Representatives eight consecutive times (Takasaki 1976).

Historic Maps

Historic maps help to paint a picture of Wai‘alae in years past and illustrate the many changes that have taken place in the region. This section presents a selection of six maps from the 19th and 20th centuries that provide insight to the project area.

The earliest map was created by the U.S. Navy using shoreline and topography data from a Hawaiian Government Survey in 1878 (Figure 5). This map depicts the south side of O‘ahu and also shows the depth of the sea floor. The project area is located on the coastal flat next to two hills. A pond is shown within Diamond Head crater and a coconut grove is seen to the east near Wai‘alae Stream. Inland, the main trail later mentioned by ‘Ī‘Ī crosses through Wai‘alae and continues east. Just off the shoreline is the label “Mud and sand over coral. Dry at L.W.” (low water).

A map of O‘ahu from 1881 shows the names of major landmarks, LCA awards, and ahupua‘a names (Figure 6). The region of the project area is shown as Kahala, while the lands to the west are Kaalawai. Just off of the Kūpikipiki‘ō Point are the words “Ten Fathom Bank” and the same pond within Diamond Head from the last map is still shown here as well.

An 1883 map depicts the entire southeast coastline of O‘ahu from Diamond Head to Koko Head. Northeast of the project area, a coconut tree grove can be seen along the river (Figure 7). The shoreline appears much as it does today, although there are now a few structures illustrated near Kūpikipiki‘ō Point and Diamond Head. One structure is not far from the project area to the west.

An O‘ahu Government Survey map from 1902 portrays land use for the project area and surrounding region (Figure 8). Grazing lands (yellow outline) extend across most of the south shore beginning just past the project lands to the east. Diamond Head and Kūpikipiki‘ō Point are federal reservations (pink). Kapi‘olani Park is shaded green for public lands and Waikīkī had not yet been filled in at this time and is still wetland for taro and rice (blue stripes).

A 1913 map illustrates fisheries along the southern coast of O‘ahu, from Diamond Head to Koko Head (Figure 9). The map shows the project area fronting the Kahala Fishery, which is labeled as “Bishop Est.” This likely indicates that the fishery was owned or managed by the Bishop Estate. To the east of the project area is Waokana; this may be a place name.

A 1927 map shows LCA awards in Kāhala and its environs (Figure 10). As mentioned above, the project area lies within LCA 228:2, which was awarded to Kaleiheana. The parcel is labeled as “Kanewai Kahala.” Kāhala Avenue is depicted on this map in its current location, along with the U.S. Military Reservation and “Kaalawai Lots.” The W.W. Thayer Subdivision is labeled in the vicinity of Kūpikipiki‘ō Point.

By 1953, the Kāhala area appears much more developed (Figure 11). The streets are in roughly the same layout as they are currently, and many structures are shown at the base of the Diamond Head slopes. A military reservation is illustrated at Kūpikipiki‘ō Point. The point is also labeled with the name more commonly used today, Black Point.

Contemporary History

The 19th century closed with the overthrow of the Hawaiian monarchy by foreigners backed by the United States and the annexation of Hawai‘i into an American territory. As the 1900s started, the U.S. military began construction of a base in Waikīkī at Fort DeRussy and later dredged the Ala Wai Canal, permanently changing the nature of Waikīkī’s landscape. This spurred a host of construction projects by developers wanting to capitalize on the filled-in former marshlands. Development came to a standstill during the Second World War

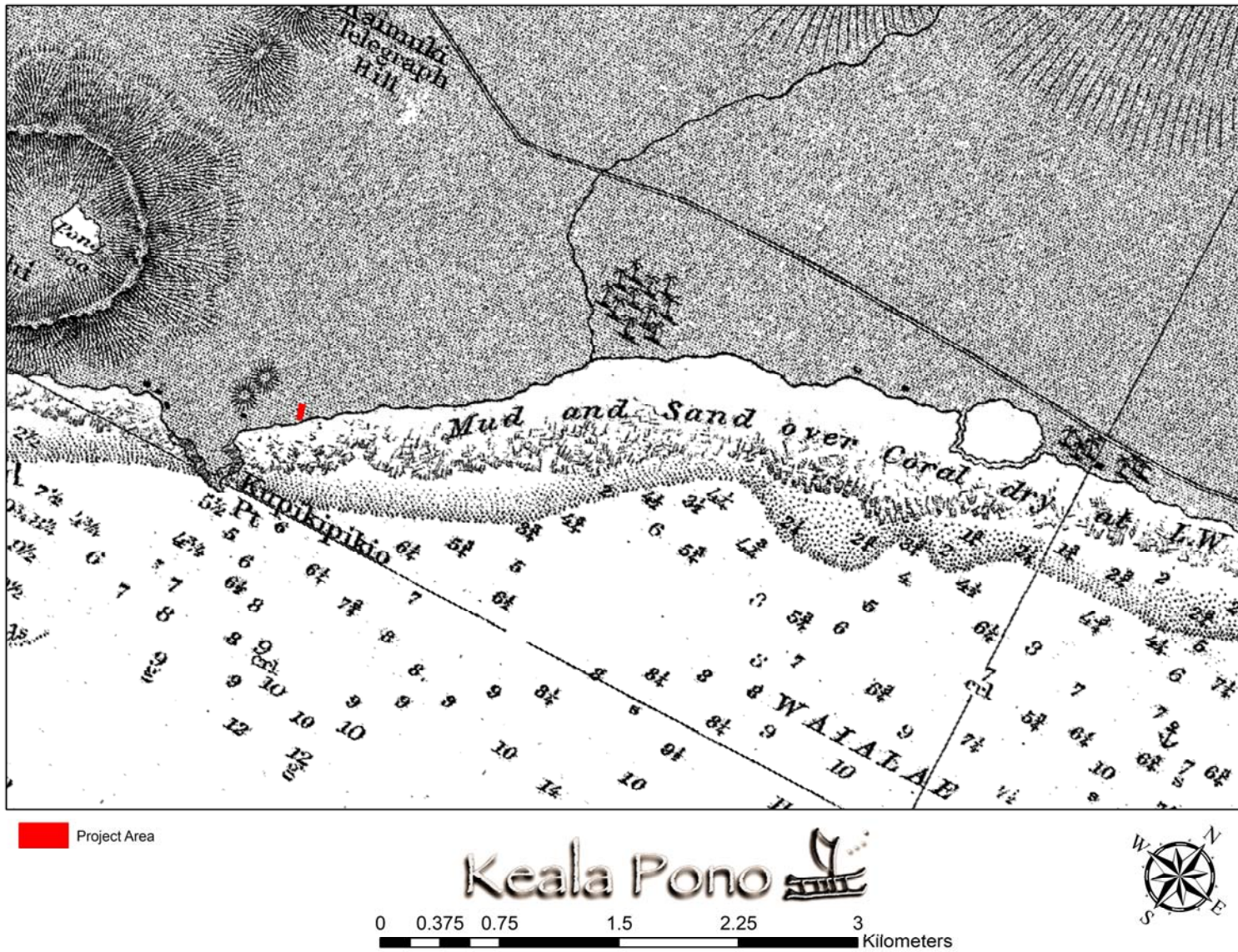
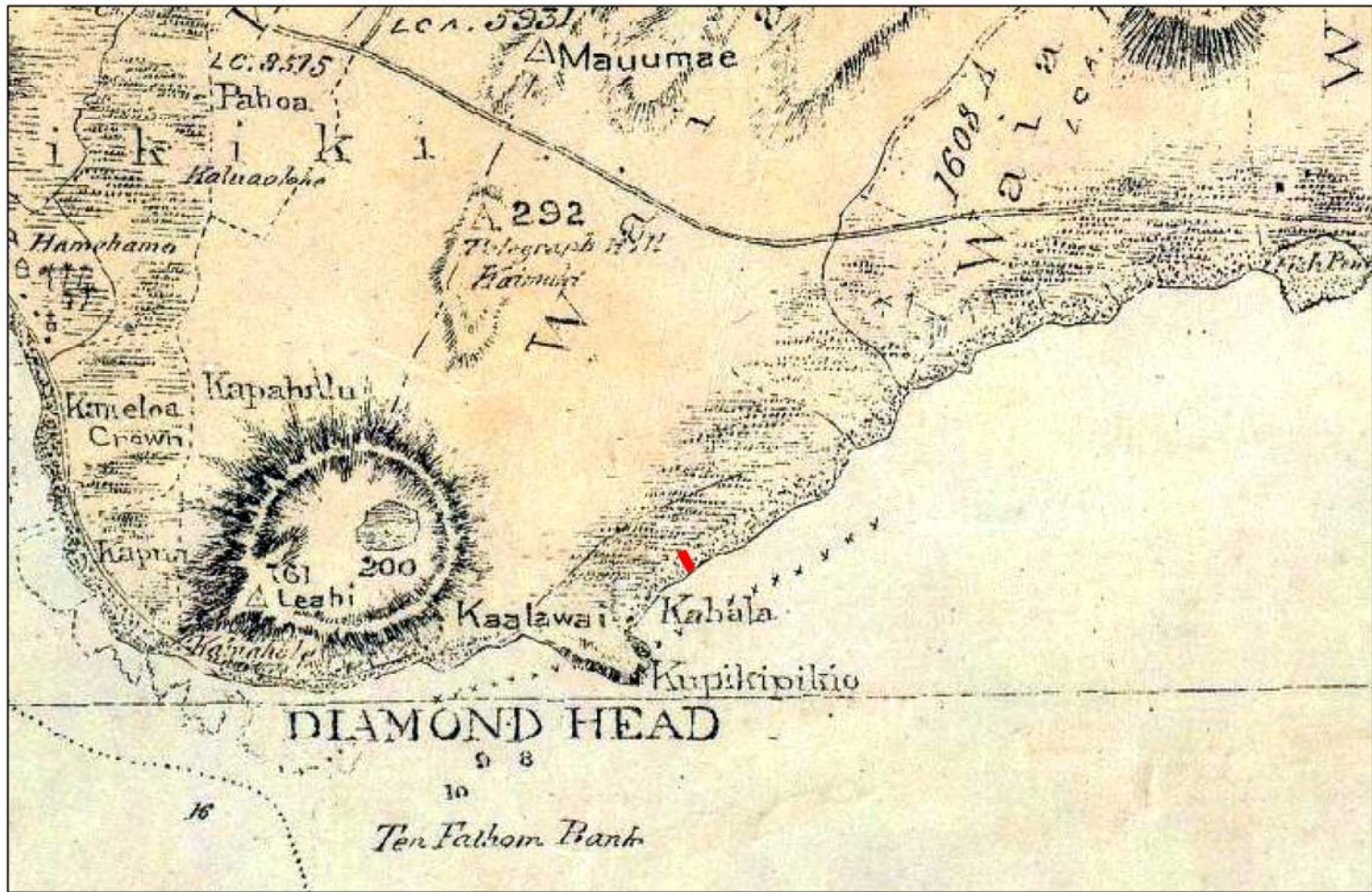


Figure 5. Portion of a map of the south side of O'ahu (U.S. Navy 1878).



 Project Area

Keala Pono 

0 0.35 0.7 1.4 2.1 2.8 Kilometers



Figure 6. Portion of an O'ahu map (Alexander 1881).

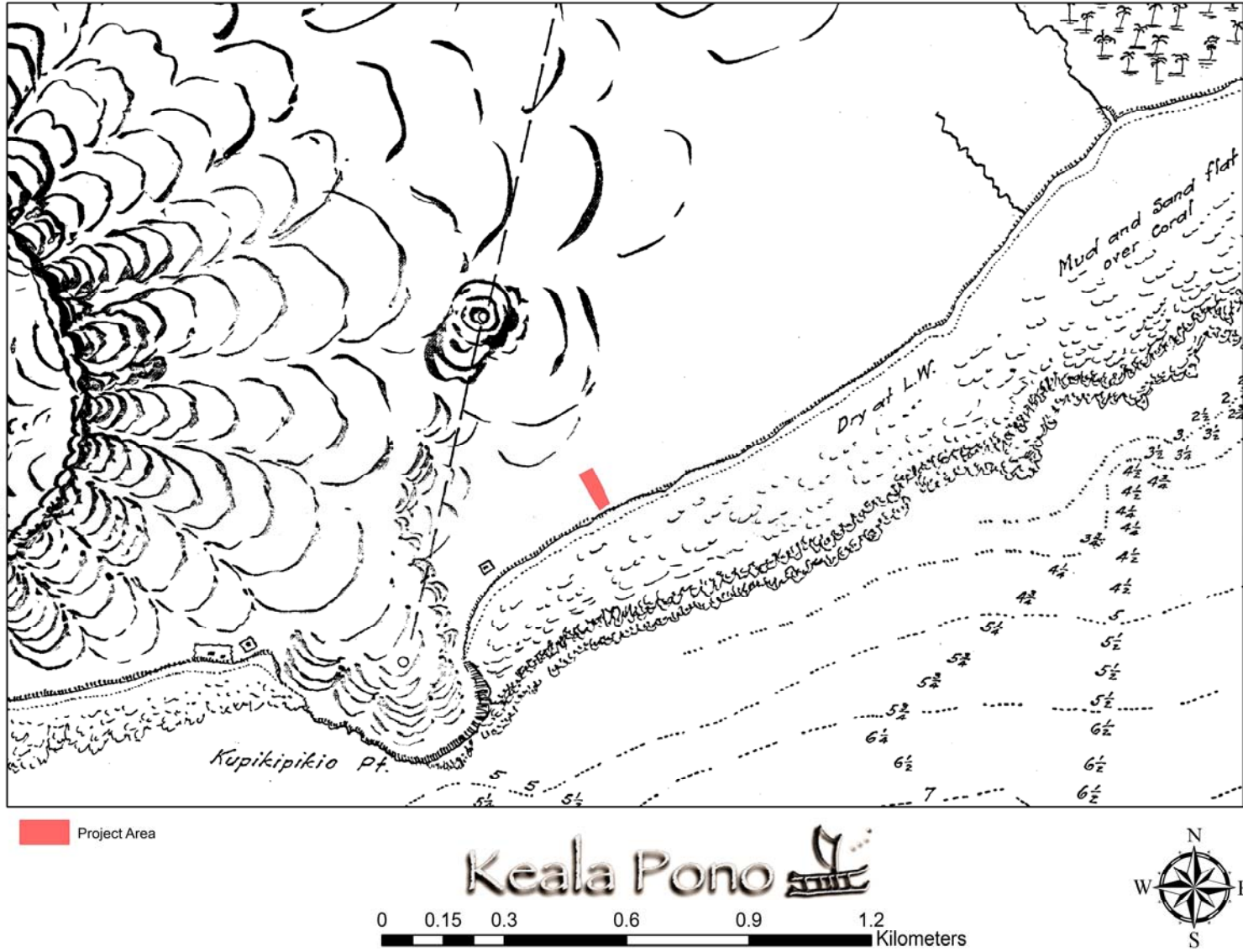
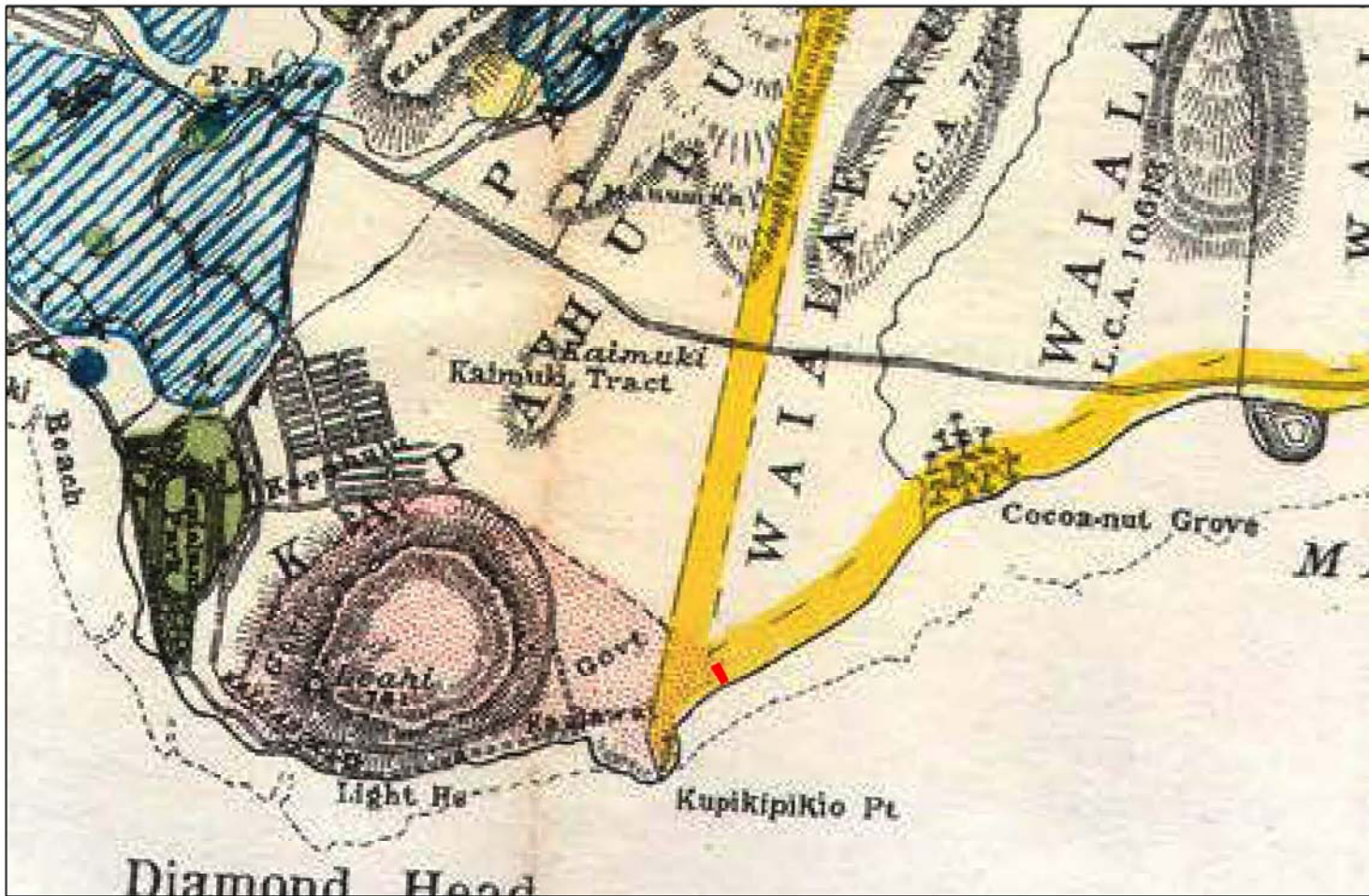


Figure 7. Portion of a map of the southeast coast of O'ahu (Wall 1883).



 Project Area



Figure 8. Portion of a map of O'ahu (Wall 1902).

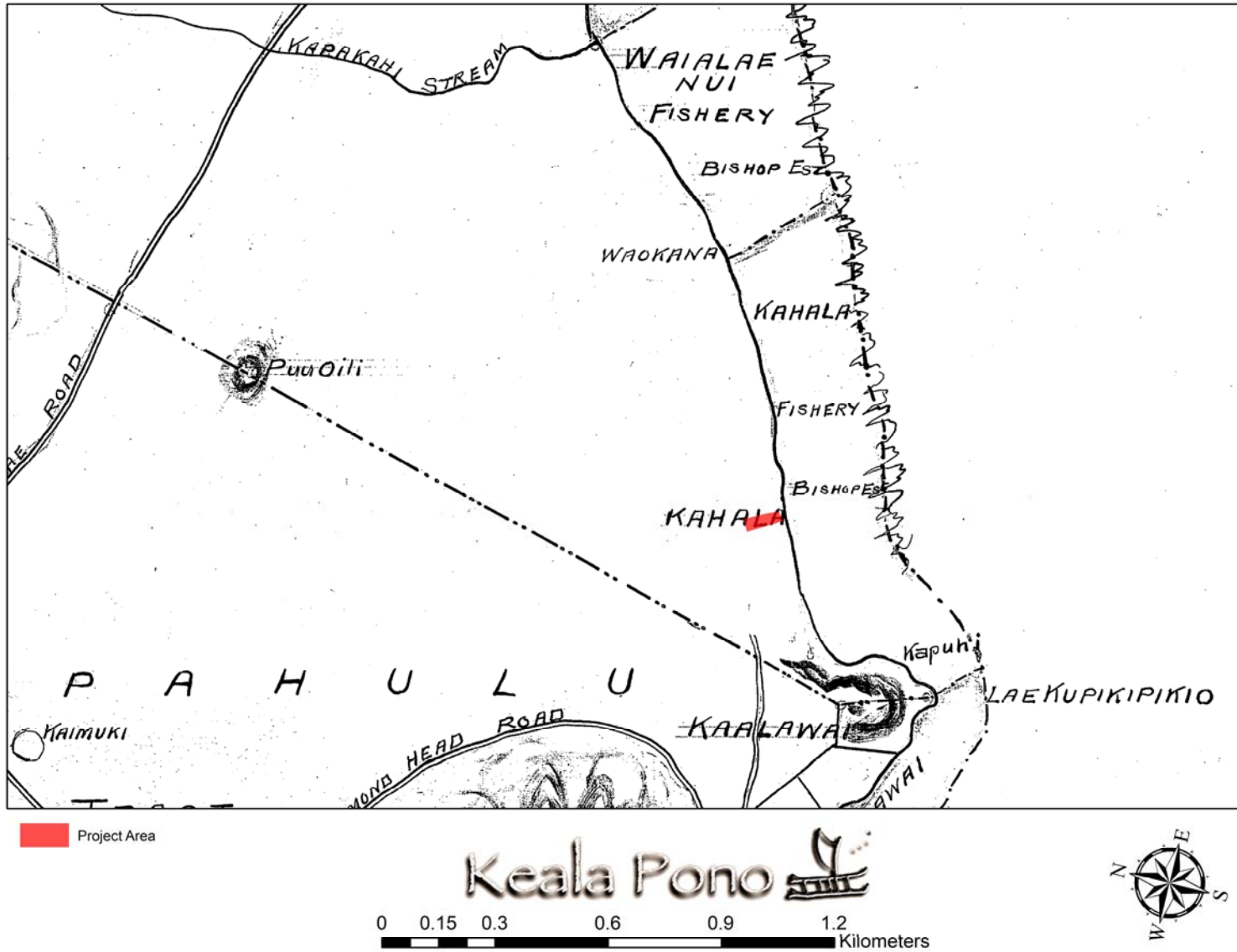


Figure 9. Portion of a fisheries map (Monsarrat 1913).

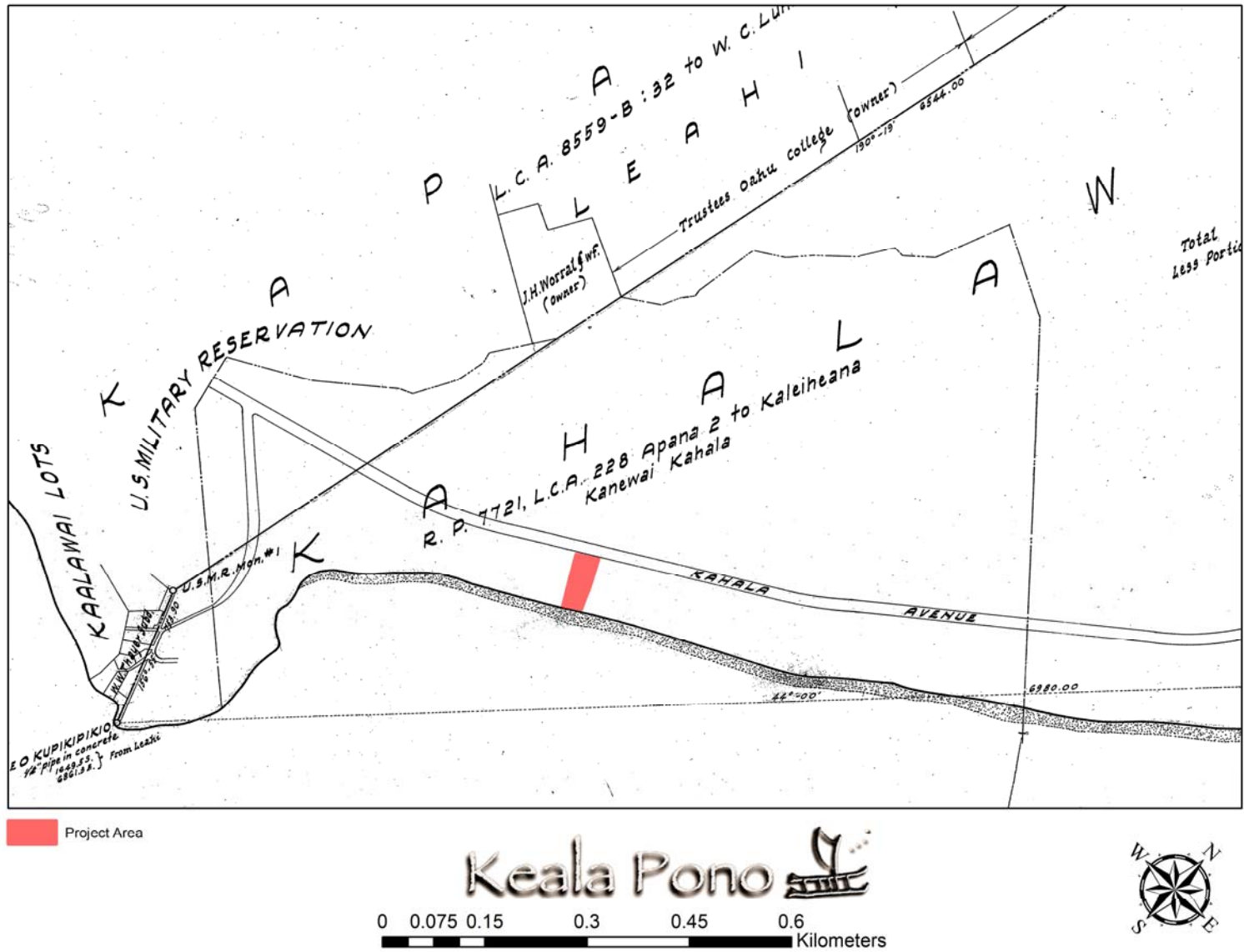


Figure 10. Portion of a map showing LCA boundaries (Podmore 1927).

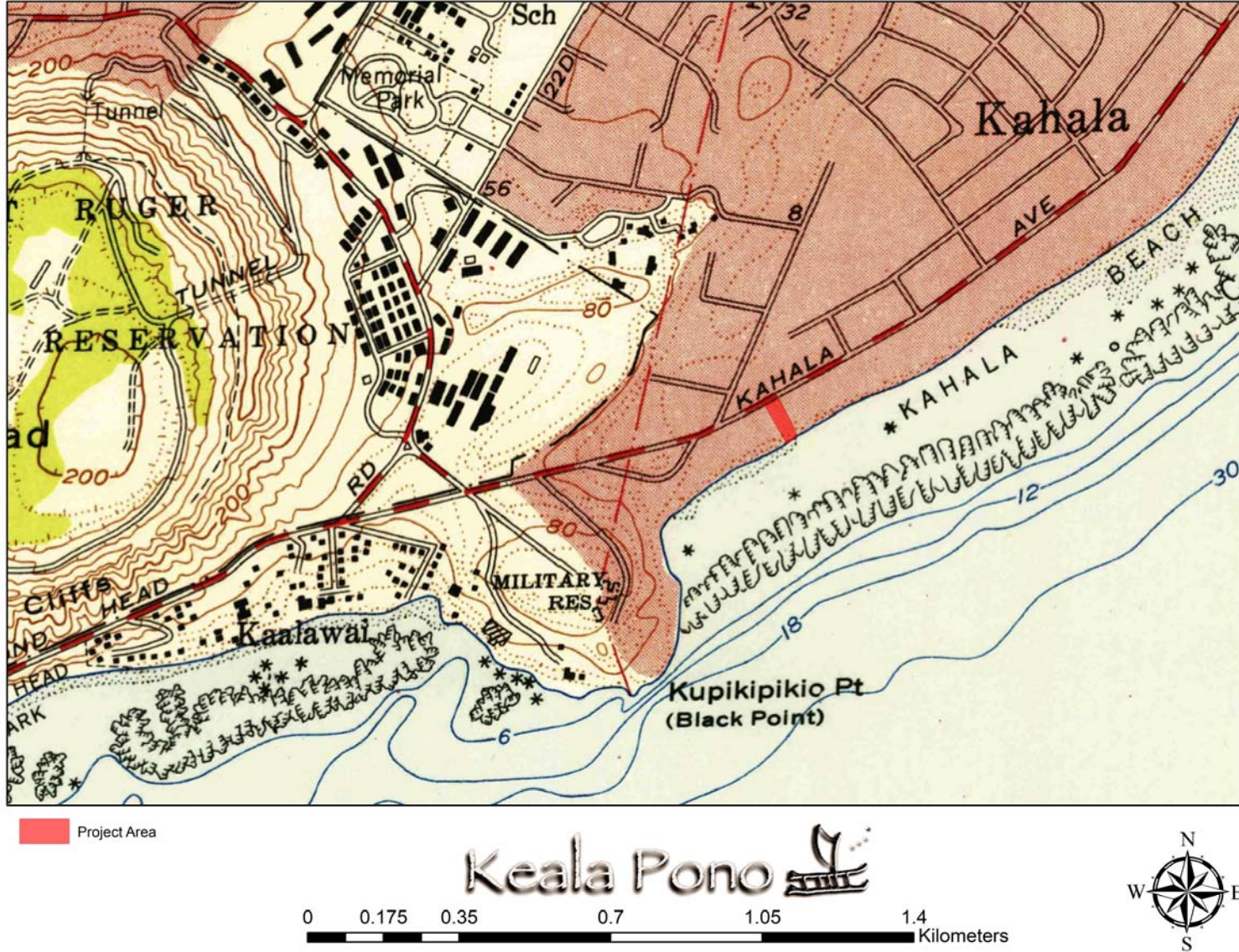


Figure 11. Portion of a Honolulu quadrangle map (USGS 1953).

when martial law strictly regulated non-military presence in Waikīkī. But after the war, many construction projects in Waikīkī were started. The latter half of the 1900s witnessed hyper-development of Waikīkī, turning it into one of the most famous tourist destinations in the world today, although the Kāhala area remains largely residential.

Previous Archaeology

Many archaeological studies have been conducted in Wai‘alae. The following discussion provides information on archaeological investigations that have been carried out in the vicinity of the project area, based on reports found in the SHPD library in Kapolei, Hawai‘i (Figure 12 and Table 1). SIHP (State Inventory of Historic Places) numbers are prefaced by “50-80-14” (Figure 13).

The earliest archaeological survey on O‘ahu was completed by J.G. McAllister in his published work, *Archaeology of Oahu* (1933). This study documented many important Hawaiian cultural sites, including heiau, at a time before many were destroyed. There are no McAllister sites in the vicinity of the current project area, although two were recorded in the Wai‘alae/Wailupe region. Kaunua Kahekili Heiau (Site 55) was located on a ridgetop that divides the land areas of Wai‘alae and Wailupe. It was said to be a very large heiau, and the site was later planted with pineapples. McAllister noted that the site was overgrown, and all that remained was “many large rocks embedded in the earth” (McAllister 1933:71). Wailupe Fishpond (Site 56) was located at the shoreline of Wailupe Ahupua‘a. McAllister described the fishpond as 41 acres in area, with a wall that was 2,500 feet long. He noted a sandy expanse at the west end of the fishpond, at least 50 feet wide where four mākāhā allowed water to pass through. The rock wall of the pond was a massive 12 feet wide (McAllister 1933). The fishpond has since been filled in and a residential development was built in its place, now referred to as Wailupe Peninsula.

Archaeological testing was performed at the Wai‘alae Shelter Cave (SIHP 2503) on Kuana Street (Soehren 1967). One test unit was excavated where shell midden, and pre- and post-contact artifacts were identified. The pre-contact artifacts included a fishhook, octopus lure, and a coral file. Post-contact artifacts included copper tubing and bottle glass from the 1880s to 1920s.

Iwi kūpuna were inadvertently identified at a construction site at 4505 Kāhala Avenue (Griffin 1987). SHPD was notified and a site visit was made to disinter the burial. The burial was a young to middle aged female in a semi-flexed position. It was later found that a second burial of a young male adult lower body was intrusive with the first. The burials were re-interred at the property and designated SIHP 3725.

Iwi kūpuna were again inadvertently identified at a construction site, this time at 4745 Aukai Avenue (Bath 1989). SHPD was notified and it was determined that the burial was partially intact. It was disinterred and further examination found that the remains were of an approximately 40–45 year-old adult male. The burial was re-interred at the property and designated SIHP 4126.

At 4585 Kāhala Avenue, human remains were first identified in 1989. Police had recovered some of the remains and transferred them into the possession of the Medical Examiner, who then notified SHPD (Kawachi 1989). At that time, all of the long bones, the pelvis, and vertebrae had been recovered, but the skull was missing. SHPD archaeologists conducted a site visit and determined that the burial had likely been in a semi-flexed position (Kawachi 1989). In the vicinity of the remains, a dark lens was located 5–7 cm below the surface (cmbs); this was thought to represent a slab of wood that was above the burial (Kawachi 1989). Hand and finger bones and ribs were recovered, but the skull and upper third of the body were never found. It was posited that the missing skeletal elements were either hauled away with backdirt or left within a large backdirt pile on the property. This large pile was not screened by the archaeologists and the final disposition of this pile remains unclear.

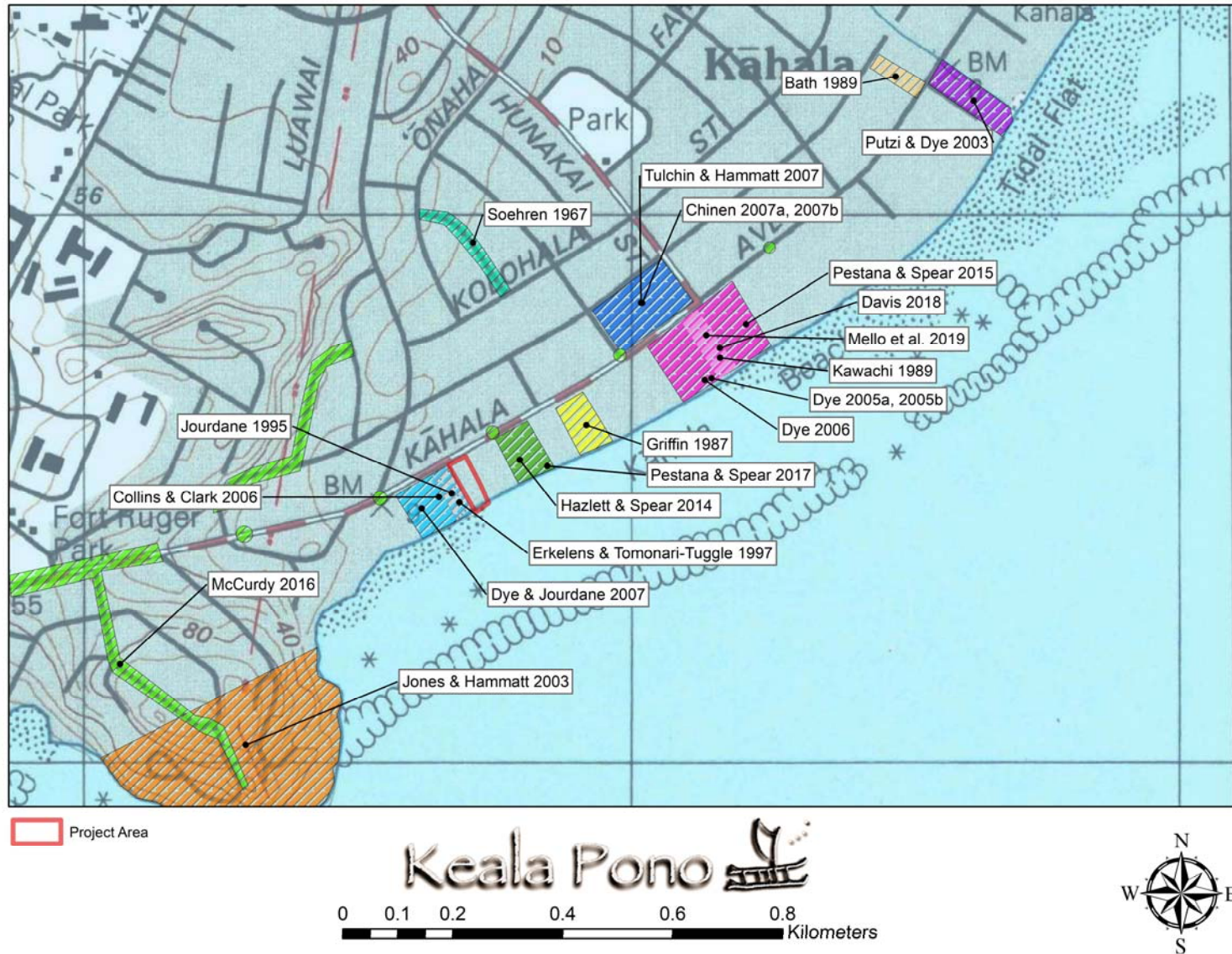


Figure 12. Previous archaeological studies in the vicinity of the project area.

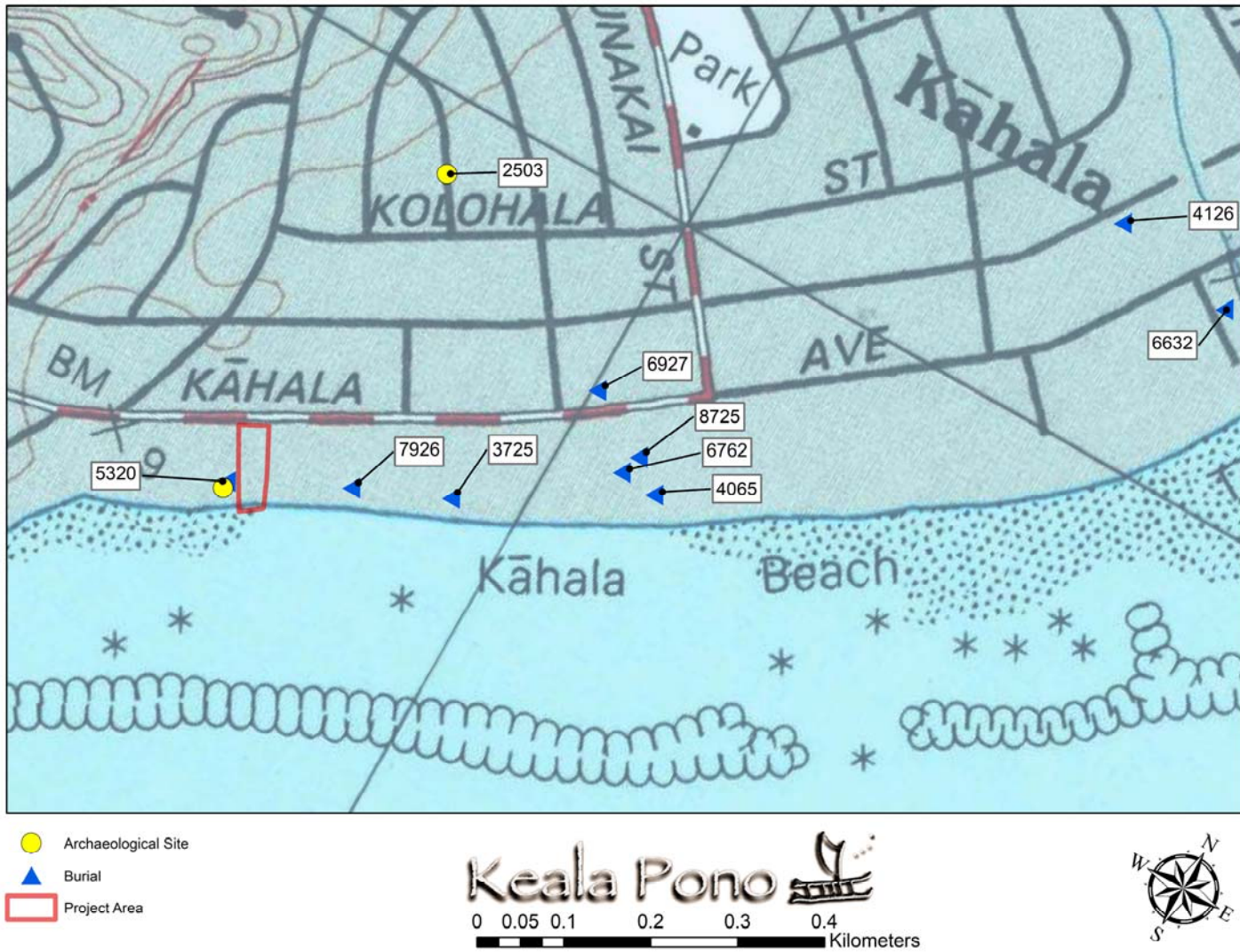


Figure 13. Known archaeological sites in the project vicinity.

Table 1. Previous Archaeological Studies in the Project Vicinity

Author/Year	Location	Study Type	Results
McAllister 1933	Island Wide	Survey	Noted two sites in the region- Site 55-Kaunua Kahekili Heiau and Site 56-Wailupe Fishpond; neither are near the current project area.
Soehren 1967	Wai‘alae- Kuana St.	Archaeological Testing	Excavated the Wai‘alae Shelter Cave (SIHP 2503); finds included midden, fishing gear, a coral file, and post-contact artifacts dating from the 1880s–1920s.
Griffin 1987	4505 Kāhala Ave.	Burial Report	Identified SIHP 3725 as a young-to middle aged female.
Bath 1989	4745 Aukai Ave.	Burial Report	Identified and disinterred SIHP 4126, a human burial.
Kawachi 1989	4585 Kāhala Ave.	Burial Report	Recorded SIHP 4065; a single partially recovered burial.
Jourdane 1995	4433 Kāhala Ave.	Burial Report	Recorded a human burial, SIHP 5320.
Erkelens and Tomonari-Tuggle 1997	4433 Kāhala Ave.	Burial Report	Documented three burials, part of SIHP 5320.
Jones and Hammatt 2003	Kūpikipiki‘o (Black Point)	Archaeological Monitoring	No findings.
Putzi and Dye 2003	4773 Kāhala Ave.	Burial Report	Recorded SIHP 6632, a cultural layer containing five burials and traditional Hawaiian artifacts.
Dye 2005a	4577 Kāhala Ave.	Burial Report	Identified a cultural layer and one in-situ and one disturbed burial (SIHP 6762).
Dye 2005b	4577 Kāhala Ave.	Burial Report	Identified a cultural layer and one in-situ and one disturbed burial (SIHP 6762).
Collins and Clark 2006	4433, 4423, & 4415 Kāhala Ave.	Archaeological Inventory Survey	Documented two cultural layers and no additional burials at SIHP 5320.
Dye 2006	4577 Kāhala Ave.	Data Recovery Plan	Prepared a burial site component to a data recovery plan for the two burials of SIHP 6762.
Chinen 2007a	4564 Kāhala Ave.	Burial Report	Identified SIHP 6927, a human burial.
Chinen 2007b	4564 Kāhala Ave.	Burial Report	Relocated SIHP 6927, a human burial.
Dye and Jourdane 2007	4433, 4423, & 4415 Kāhala Ave.	Archaeological Inventory Survey	Reinterpreted the two previously identified cultural layers of SIHP 5320 as a single A-horizon containing historic artifacts.
Tulchin and Hammatt 2007	4564 Kāhala Avenue	Burial Recovery	Recovered additional skeletal elements of the SIHP 6927 burial.
Hazlett and Spear 2014	4465 & 4469 Kāhala Ave.	Archaeological Inventory Survey	No findings.
Pestana and Spear 2015	4607 Kāhala Avenue	Archaeological Inventory Survey	No findings.
Pestana and Spear 2017	4465 & 4469 Kāhala Ave.	Archaeological Monitoring	Recorded SIHP 7926, a human burial.
Davis 2018	4585 Kāhala Ave.	Burial Recovery	Identified more than 200 skeletal elements intermixed with pre- and post-contact artifacts
Mello et al. 2019	4585 Kāhala Ave.	Archaeological Inventory Survey	Recorded three human burials which were included with SIHP 4065; also identified SIHP 8725, six historic features.

A recent archaeological inventory survey was completed for the same property at 4585 Kāhala Avenue (Mello et al. 2019). One aim of this initial AIS was to identify the remainder of the burial previously identified by Kawachi in 1989 (Burial 1), but the rest of Burial 1 was not found. However, three additional components to SIHP 50-80-14-4065 were identified (Burial Finds 2–4) and one newly identified historic property was recorded, SIHP 50-80-14-8725. This new property consists of six sub-surface features related to historic land use including four post-molds and two pit features (Mello et al. 2019). Burial Finds 2 and 3 were identified in a secondary context and Burial Find 4 was identified in a primary, in-situ context. Burial Find 2 consisted of highly fragmentary human remains located from 68–86 cmbs. Burial Find 3 was located at approximately 90 cmbs and consisted of three juvenile cranial fragments. Burial Find 4 was located from 103–123 cmbs and was found in-situ, articulated, and in a flexed position with the head facing towards the ocean, to the east. Osteological analysis determined that the remains were that of a sub-adult, 4–9 years old, likely of Native Hawaiian ancestry, but gender was undetermined. Burial Finds 2–4 were designated components of SIHP 50-80-14-4065 (Mello et al. 2019).

During unmonitored seawall repairs in 2018, additional human remains were inadvertently identified at the same property at 4585 Kāhala Avenue (Davis 2018). Osteological analysis indicated that the remains consisted of three individuals. This find was subsequent to the completion of the Mello et al. 2019 fieldwork. SHPD made a site visit and requested that backdirt piles from the seawall be screened. More than 200 elements of human skeletal remains intermixed with pre- and post-contact artifacts were identified.

Several archaeological investigations were also completed in and surrounding 4433 Kāhala Avenue, adjacent to the project area to the west. First, iwi kūpuna were inadvertently identified during construction (Jourdane 1995). SHPD was notified and it was determined that the burial likely originated from a subsurface cultural layer located approximately 60–95 cmbs. The burial was disinterred and relocated at the property and both the burial and cultural layer were designated as SIHP 5320. A subsequent burial recovery was conducted at the same property, due to the excavation of an elevator shaft (Erkelens and Tomonari-Tuggle 1997). Three separate sets of human skeletal remains were identified. Burial 1 was recovered after sifting through the backdirt piles and determined to be that of a 30–35 year-old male. When the elevator excavation was examined, a fire pit feature and a burial pit outline were observed in the excavation wall. An additional 4 m by 2.5 m section was excavated surrounding the burial pit outline where Burials 2 and 3 were identified. Burial 2 was a 20–25 year old woman, and Burial 3 was a 3 year-old child. The authors speculated that Burials 2 and 3 were related due to their proximity to each other. A square cut nail was identified with Burial 3 indicating interment in the 19th century. Burials 1–3 were relocated at the property and included with the SIHP 5320 site number. Later an archaeological inventory survey was conducted at the parcel along with two neighboring properties; 4423, and 4415 Kāhala Avenue (Collins and Clark 2006). A total of 51 test units were excavated. Two cultural layers were identified; the upper layer was a historic-era occupation and the lower layer was believed to be associated with pre-contact Hawaiian habitation. Minimal quantities of charcoal, fire-cracked rock, fish bone and marine shell were found in association with the cultural layers. A later archaeological inventory survey was completed in an attempt to relocate the 1997 burial interment location (Dye and Jourdane 2007). A total of 20 shovel test pits were excavated in locations that were tested earlier. The cultural layers were encountered but the layers were of “a single old land surface, or paleosol, upon which a variety of historic-period artifacts had been deposited” (Dye and Jourdane 2007:32).

Archaeological monitoring was conducted in support of water system improvements in the Black Point vicinity (Jones and Hammatt 2003). Excavations for the water system remained shallow throughout, approximately 50 cmbs. No historic properties were identified.

Iwi kūpuna were inadvertently identified during the excavation of a utility line at 4773 Kāhala Avenue (Putzi and Dye 2003). Further investigation revealed a cultural layer containing five burials and several pre-contact Hawaiian artifacts. SIHP 6632 was assigned to the cultural layer and burials.

Iwi kūpuna were inadvertently identified during the excavation of a sewer line located at 4577 Kāhala Avenue (Dye 2005a, 2005b). A cultural layer was found that contained one in-situ burial and one disturbed burial. Both were disinterred and relocated on the property. SIHP 6762 was assigned to the cultural layer and burials (Dye 2006).

Iwi kūpuna were inadvertently identified during construction activities located at 4564 Kāhala Avenue (Chinen 2007a). SHPD conducted a site visit, where it became apparent that human remains had been scattered all over the property. It was determined that a qualified archaeological consultant would need to be contracted to screen the backdirt piles and complete controlled block excavations to identify the original burial location and identify the presence or absence of additional burials. Additional remains were then recovered from the backdirt piles and excavation was completed on 25 test units, but the original burial site was not located (Tulchin and Hammatt 2007). All remaining construction-related activities were monitored, and additional skeletal elements were identified. These remains were thought to be from the previously identified burial. The remains were then relocated and designated as SIHP 6927 (Chinen 2007b).

An archaeological inventory survey was conducted in support of excavations for a retaining wall near the current project area to the east (Hazlett and Spear 2014). A subsurface A-horizon was recorded within several of the trenches, but no cultural remains were found in association. Therefore, the authors reported that no historic properties were identified within the project area, but archaeological monitoring was still recommended due to the high potential for significant finds. Subsequent archaeological monitoring was conducted at the same project area (Pestana and Spear 2017). Human skeletal remains were inadvertently identified at approximately 300 cmbs at the makai end of the project. The burial was in-situ, with mandible fragments and a pit outline identified, and it was assigned SIHP 7926.

An archaeological inventory survey was completed at 4607 Kāhala Avenue (Pestana and Spear 2015). A total of ten test trenches were excavated and a former land surface A-horizon and remnant modern building foundations were documented. The A-horizon contained no cultural material, so the authors reported that no historic properties were identified. However, archaeological monitoring was still recommended for any future subsurface work.

The Kuilei Cliffs Small Cell Network project required a literature review and field inspection to be conducted (McCurdy 2016). There were no finds during the brief field visit, however due to the “traditional importance of Diamond Head and previous archaeological investigations” the area was determined to have potential for pre- and post-contact cultural materials.

Summary and Anticipated Finds

Based on the review of land use and previous archaeological investigations, there is high potential for historic properties to occur in the project area. The project location is along the native coastline and underlying soils consist of Beach sand (BS) and Jaucas sand (JaC) (Foote et al. 1972; see Figure 3), an environment traditionally favored for human burials. Previous archaeological studies have identified iwi kūpuna (SIHP 5320) in the parcel adjacent to the current project area to the west. Additional human remains and pre- and post-contact artifacts and features are located in proximity. It is likely that these kinds of remains could be found during test excavations for this AIS.

Research questions will broadly address the identification of historic properties and may become more narrowly focused based on the kinds of resources that are found. Initial research questions are as follows:

1. Is it possible that features of Site 5320 located at the adjacent parcel extends into the current project area?
2. Are there any indications of pre-contact and/or historic land use? Are cultural layers, features, and artifacts present within the project area? If so, what do those resources indicate about habitation and/or subsistence patterns?

Once these basic questions are answered, additional research questions can be developed in consultation with SHPD, tailored to the specific kinds of historic properties that occur in the study area.

METHODS

Pedestrian survey and subsurface testing were conducted on April 15, 2021 by Windy McElroy, PhD, Kālenalani McElroy, MA, and Robin Kapoi, BA. McElroy served as Principal Investigator, overseeing all aspects of the project. A total of 16 hours were expended by the three employees for the survey.

For the pedestrian survey, the ground surface was visually inspected for surface archaeological remains, with transects walked for the entire project area. Of the .329 hectare (0.81 ac.) survey area, 100% was covered on foot, with archaeologists spaced approximately 5 m apart. Vegetation was very sparse throughout the survey area, and did not limit the survey effort. In addition, much of the survey area is covered in the remains of pavement and a former tennis court.

A total of five trenches were excavated to determine the presence or absence of subsurface archaeological deposits or material using a mini excavator (Figure 14). Vertical provenience was measured from the surface, and trenches were excavated to approximately 60–90 cm below surface (cmbs) (2–3 ft.), as agreed upon beforehand by SHPD. This is slightly deeper than the 45 cm (1.5 ft.) excavations proposed for the construction phase of the project, and this depth was chosen to avoid disturbing any archaeological remains or iwi kūpuna that would not be encountered during construction. Profiles were drawn and photographed for each trench. Profile locations were recorded with a 3 m-accurate Garmin 62st GPS unit. An iPhone XS Max camera was used to take digital photos of the excavations and stratigraphy. Soils were described using the USDA Soil Survey Manual (Soil Science Division Staff 2017), Munsell soil color charts (Munsell 2010), and a sediment texture flowchart (Thien 1979). All trenches were backfilled after excavation and damaged pavement was hauled away with a dump truck.

The scale in all field photographs is marked in 10 cm increments. The north arrow on all maps points to magnetic north. Throughout this report rock sizes follow the conventions outlined in Field Book for Describing and Sampling Soils: Gravel <7 cm; Cobble 7–25 cm; Stone 25–60 cm; Boulder >60 cm (Schoeneberger et al. 2002:2-35). No material was collected; field notes and photo logs are being curated at the Keala Pono office in Kapolei, Hawai'i.



Figure 14. Heavy equipment used during the AIS. View is to the southeast.

RESULTS

Pedestrian survey and subsurface testing were conducted in the .329 ha (0.81 ac.) project area. No archaeological resources were found. Excavation of five test trenches did not yield any evidence of subsurface archaeological deposits or features. Stratigraphy generally consisted of topsoil or pavement atop various fill layers, which are underlain by a natural beach sand deposit. All of the trenches exhibited previous disturbance as evidenced by buried utility lines and the presence of modern debris.

Pedestrian Survey

The surface survey included 100% of the .329 ha (0.81 ac.) parcel. The majority of the survey area was open with short grass and pavement and a few large trees (Figure 15). No surface archaeological remains were observed within any parts of the project area; any archaeological features that may have once been present are no longer there because of former residential use.

Subsurface Testing

The subsurface testing strategy was approved by SHPD before testing began. A total of five trenches were excavated to determine the presence or absence of subsurface archaeological deposits or material (Figure 16). Trenches were excavated to approximately 60–90 cmbs (2–3 ft.), which is slightly deeper than the 45 cm (1.5 ft.) excavations planned for the construction phase of the project. This depth was chosen to avoid impacting any archaeological remains or iwi kūpuna that would not be disturbed during construction. No archaeological deposits or cultural materials were found during testing. Stratigraphic profiles were drawn and photographed for each trench. Stratigraphic layers identified in individual profiles were then organized according to their various depths to form a site-wide Harris Matrix according to the methodology put forth by Colin Renfrew and Paul Bahn (2016).



Figure 15. Project area conditions during the AIS. View is to the northwest.

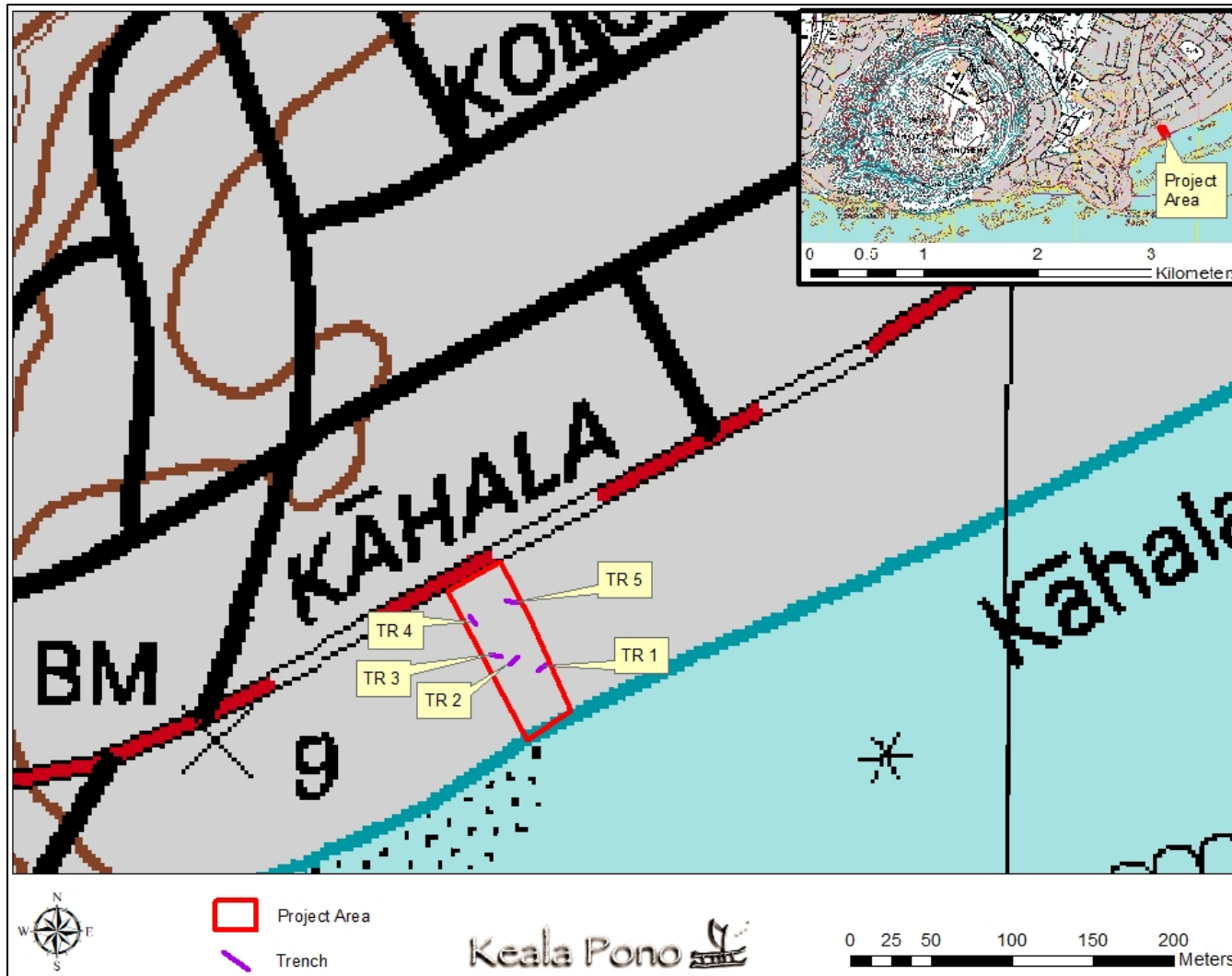


Figure 16. Location of trenches on a USGS topographic map (USGS 1998).

Harris Matrix

All five trenches revealed culturally sterile subsurface deposits, with a total of six stratigraphic layers present in the Harris Matrix (Table 2). The six layers are as follows:

Layer I is a topsoil that comprises the non-paved surface throughout the study area. It is a slightly to moderately sticky, slightly to very plastic, dark brown sandy clay loam. Layer I was typically found on the surface. On average, Layer I ranges in depth from 0–18 cmbs and typically includes 10% roots and 5% basalt pebbles and gravel. Abandoned utility lines amidst other modern debris were encountered.

Layer II is the pavement found intermittently throughout the study area. Averaging in depth from 0–18 cmbs, Layer II is the concrete pavement of the tennis court and concrete slabs currently visible on the surface of the property.

Layer III is a basecourse found intermittently below the pavement throughout the study area. It is a moderately sticky, very plastic, gray clay. On average, Layer III ranges in depth from 10–28 cmbs and typically contains roughly 90% basalt gravel. Abandoned utility lines and other modern debris were encountered in this layer.

Layer IV is a fill layer intermittently encountered throughout the project area. It is a moderately sticky, very plastic, dark brown sandy clay. Layer IV was found as shallow as the surface and exceeded the excavation depth of 70 cmbs in TR 5, with average depths ranging from 14–67 cmbs. Layer IV typically includes 7% roots and 5–50% basalt gravel and cobbles. Abandoned utility lines were found within Layer IV.

Layer V is a fill layer intermittently encountered throughout the project area. It is a non-sticky, non-plastic, pale brown fine to medium sand. On average, Layer V ranged in depth from 20–52 cmbs and sometimes contained 5% roots. This layer also contained abandoned utility lines and modern debris.

Layer VI is a natural layer of beach sand present beneath the fill exposed in TR 1–TR 4. It is a non-sticky, non-plastic, very pale brown fine sand. On average, Layer VI was found at a minimum depth of 34 cmbs and extended to the base of excavation in the four trenches where it was exposed (averaging 76 cmbs). Modern debris and abandoned utility lines were found in Layer VI, indicating disturbance of the natural beach sand at these depths.

Individual Trench Stratigraphy

The Harris Matrix above was formed through the analysis of five exploratory trenches excavated throughout the project area (see Figure 16). These trenches are individually described in Table 3 and discussed in more detail in the following paragraphs.

TR 1 was excavated on the east side of the property (see Figure 16). This trench had to be stopped short because of the occurrence of a substantial concrete slab (50 cm+ thick) that was encountered on the west end of the trench. The trench measured 3.7 m long and 76 cm wide and was excavated to 60 cmbs. Stratigraphy consisted of a layer of topsoil (Layer I), a layer of fill (Layer V) disturbed by another fill deposit Layer Va), with natural beach sand below (Layer VI) (Figures 17 and 18). Abandoned utility lines were observed in Layers I, V, and VI, and modern debris was found in Layers I and V, indicating prior disturbance. No archaeological deposits or cultural material were identified.

Table 2. Harris Matrix Stratigraphy Throughout the Project Area

Harris Layer	Avg Min / Max Depth*	Munsell Color	Texture	Description	Interpretation
I	0–18	10YR 3/3	Sandy Clay Loam	Slightly to moderately sticky, slightly to very plastic, typically containing 10% roots, 5% pebbles, modern debris, and abandoned utility lines.	Topsoil
II	0–18	N/A	Concrete	Concrete pavement.	Pavement
III	10–28	10YR 5/1	Clay	Moderately sticky, very plastic, typically containing 90% basalt gravel, modern debris, and abandoned utility lines.	Base Course
IV	14–67	5YR 3/4	Sandy Clay	Moderately sticky, very plastic, typically containing 7% roots, 5–50% basalt gravel and cobbles, and abandoned utility lines.	Fill
V	20–52	10YR 6/3	Fine to Medium Sand	Non-sticky, non-plastic, typically containing 5% roots, modern debris, and abandoned utility lines.	Fill
VI	34–76	10YR 8/2	Fine Sand	Non-sticky, non-plastic, typically containing modern debris and abandoned utility lines.	Natural Beach Sand

*cmbs

TR 2 was placed approximately in the center of the property (see Figure 16). The trench measured 7.5 m long and 110 cm wide and was excavated to 90 cmbs. Stratigraphy consisted of the Layer V fill layer above the lower natural layer of beach sand (Layer VI) (Figures 19 and 20). The Layer II pavement was present in this area but was pulled back so that it was not visible in the trench stratigraphy and is therefore not documented here. Modern debris, including construction materials, as well as abandoned utility lines were exposed in both layers. No archaeological deposits or material were identified.

TR 3 was located on the west side of the property (see Figure 16). This trench had to be stopped short because of the occurrence of a very thick concrete slab that was encountered on the east end of the trench. The trench measured 5.1 m long and 100 cm wide and was excavated to 90 cmbs. Stratigraphy consisted of the Layer II pavement, a thin layer of basecourse (Layer III), a fill deposit (Layer V), an intrusive lens of fill within Layer V (Layer Va), and the lower natural layer of beach sand (Layer VI) (Figures 21 and 22). Modern debris was observed in Layers III and V, and utility lines were also encountered in Layer III. No archaeological deposits or material were identified.

TR 4 was placed on the northwest side of the property on the current tennis court (see Figure 16). The trench measured 7.6 m long, 90 cm wide, and was excavated to 70 cmbs. Stratigraphy consisted of the Layer II pavement, Layer III basecourse, Layer IV fill, and Layer VI natural beach sand. Modern debris was observed in Layers III and IV, and utility lines were also encountered in Layer IV. No archaeological deposits were identified (Figures 23 and 24).

Table 3. Individual Trench Stratigraphy

Profile	Harris Layer	Minimum Depth	Maximum Depth	Roots %	Rocks %	Boundary Character / Distinctness	Contents
TR 1	I	0	18	10%	5%	Smooth / Very Abrupt	Modern Debris; Utility Lines
	V	18	24	5%	0%	Smooth / Very Abrupt	Modern Debris; Utility Lines
	Va	24	30	2%	5%	Broken / Very Abrupt	None
	VI	30	60+	0%	0%	Base of Excavation	Utility Line
TR 2	V	0	90+	10%	5%	Smooth / Abrupt	Modern Debris; Utility Lines; Rebar; Brick
	VI	22	90+	0%	0%	Base of Excavation	Modern Debris; Utility Lines
TR 3	II	0	10	-	-	Smooth / Very Abrupt	-
	III	10	20	0%	90%	Smooth / Very Abrupt	Modern Debris; Utility Lines
	V	20	50	0%	0%	Smooth / Gradual	Modern Debris
	Va	30	40	0%	0%	Broken / Very Abrupt	-
	VI	30	90+	0%	0%	Base of Excavation	-
TR 4	II	0	25	-	-	Smooth / Very Abrupt	-
	III	25	28	0%	90%	Smooth / Very Abrupt	Modern Debris
	IV	28	53	0%	5%	Smooth / Gradual	Modern Debris; Utility Lines
	VI	53	70+	0%	0%	Base of Excavation	-
TR 5	IV	0	70+	7%	50%	Base of Excavation	Modern Debris; Utility Line
	IVa	30	50	0%	0%	Broken / Very Abrupt	Utility Line
	IVb	30	60	3%	1%	Broken / Very Abrupt	-
	IVc	58	65	0%	0%	Broken / Very Abrupt	-

TR 5 was placed on the northeast side of the property (see Figure 16). The trench measured 8.8 m long and 85 cm wide and was excavated to 70 cmbs. A single layer of fill was exposed in this trench (Layer IV), with three discontinuous fill lenses within it (Figures 25 and 26). Utility lines were encountered in Layers IV and IVa, and modern debris was observed in Layer IV. No archaeological deposits or material were identified.

Summary of Findings

Previous archaeological investigations in the vicinity of TMK: (1) 3-5-003:007 identified human remains as well as pre- and post-contact artifacts and features. Our research questions to aid in the identification of archaeological resources for this project were as follows: 1) Is it possible that features of Site 5320 located at the adjacent parcel extends into the current project area? 2)

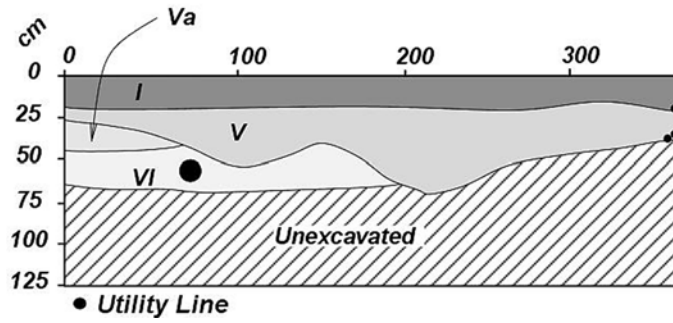


Figure 17. TR 1 southeast face profile drawing.



Figure 18. TR 1 southeast face profile photo, northeast end of trench.

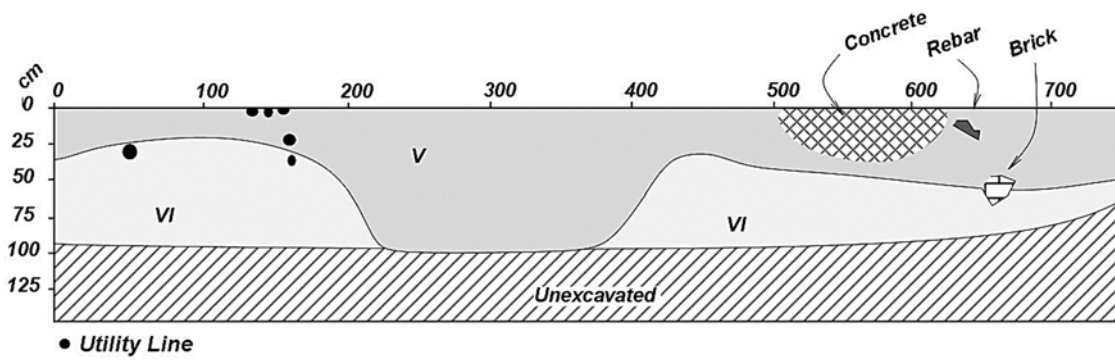


Figure 19. TR 2 southeast face profile drawing.



Figure 20. TR 2 southeast face profile photo, northeast end of trench.

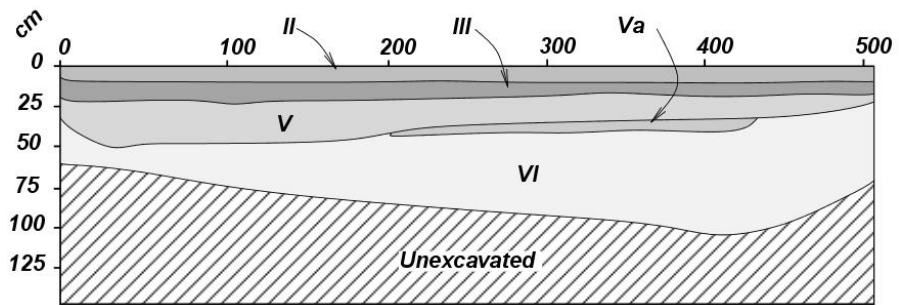


Figure 21. TR 3 north face profile drawing.



Figure 22 TR 3 north face profile photo, west end of trench.

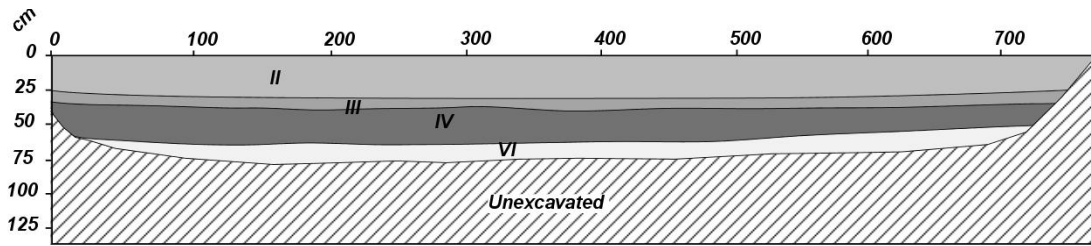


Figure 23. TR 4 northeast face profile drawing.



Figure 24. TR 4 northeast face profile photo, southwest end of trench.

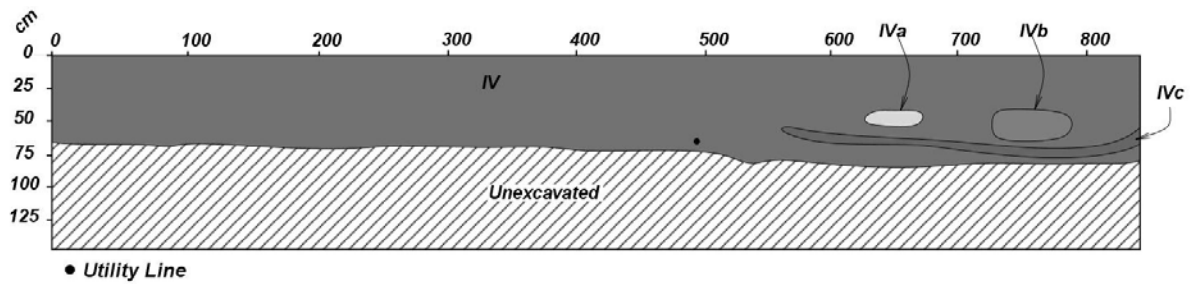


Figure 25. TR 5 south face profile drawing.



Figure 26. TR 5 south face profile photo, center of trench.

Are there any indications of pre-contact and/or historic land use? Are cultural layers, features, and artifacts present within the project area? If so, what do those resources indicate about habitation and/or subsistence patterns?

This study identified no surface or subsurface archaeological remains and deposits. The pedestrian survey of the .329 ha (0.81 ac.) parcel produced no evidence of surface archaeological remains. Any archaeological features that may have once been present are no longer there because of former residential use. The subsurface testing, consisting of five trenches, did not identify any subsurface cultural remains. Stratigraphy generally consisted of topsoil or pavement atop various fill episodes, which are underlain by a natural beach sand deposit. All of the trenches exhibited previous disturbance as evidenced by buried utility lines and the presence of modern debris.

Given the lack of cultural findings, the two research questions presented above can be answered in the negative, as no features of Site 5320 or other vestiges of pre-or post-contact land use were identified. It is possible that cultural remains occur at a depth greater than what was excavated during the subsurface testing. As construction ground disturbance will not exceed this depth, any potential cultural features that may be located on the property will remain undisturbed.

SUMMARY AND RECOMMENDATIONS

An archaeological inventory survey was conducted on TMK: (1) 3-5-003:007 in the Kāhala neighborhood in Waikīkī Ahupua‘a, Honolulu District, on the island of O‘ahu. Residential construction is proposed for the property, with ground disturbance not to exceed a depth of 45 cm (1.5 ft.). The archaeological work included pedestrian survey that covered 100% of the .329 ha (0.81 ac.) project area, as well as test excavations consisting of five trenches.

No surface archaeological remains were found during pedestrian survey of the project area. The entire area has been disturbed by former residential use, and because of this any archaeological features that may have once been present on the surface are no longer there. Likewise, subsurface testing did not yield any evidence of buried archaeological features or deposits. Due to the negative findings, the AIS results are presented as an archaeological assessment per HAR §13-275-5(b)(5)(A).

Even though this survey did identify any cultural properties, archaeological monitoring is recommended because of the occurrence of human burials and other archaeological sites nearby. An archaeological monitoring plan should be prepared for the property in accordance with HAR §13-279-4. Should human burial remains be discovered during construction activities, work in the vicinity of the remains should cease immediately and the SHPD should be contacted.

GLOSSARY

ahupua‘a	Traditional Hawaiian land division usually extending from the uplands to the sea.
ali‘i	Chief, chiefess, monarch.
‘auwai	Ditch, often for irrigated agriculture.
hālau	Meeting house for hula instruction or long house for canoes.
hau	The indigenous tree <i>Hibiscus tiliaceous</i> , which had many uses in traditional Hawai‘i. Sandals were fashioned from the bark and cordage was made from fibers. Wood was shaped into net floats, canoe booms, and various sports equipment and flowers were used medicinally.
heiau	Place of worship and ritual in traditional Hawai‘i.
i‘a	Fish or other marine animal.
‘ie‘ie	The vine <i>Freycinetia arborea</i> , an endemic, woody branching climber that grows at altitudes of 300–600 m. In ancient Hawai‘i, vines were considered sacred and used in basketry and for ceremonial purposes.
‘ili	Traditional land division, usually a subdivision of an ahupua‘a.
ipu	General name for a vessel or container. Also the bottle gourd <i>Lagenaria siceraria</i> or <i>L. vulgaris</i> , which was used traditionally for containers, hula instruments, and for medicine.
iwi	Bone.
kahe	To flow, trickle, melt, drop, or menstruate; in heat; a school of fish.
kahuna	An expert in any profession, often referring to a priest, sorcerer, or magician.
kalo	The Polynesian-introduced <i>Colocasia esculenta</i> , or taro, the staple of the traditional Hawaiian diet.
kama‘āina	Native-born.
kapu	Taboo, prohibited, forbidden.
ko‘a	Fishing shrine.
konohiki	The overseer of an ahupua‘a ranked below a chief; land or fishing rights under control of the konohiki; such rights are sometimes called konohiki rights.
kou	The flowering tree, <i>Cordia subcordata</i> , either native to Hawai‘i or introduced by Polynesians.
kuleana	Right, title, property, portion, responsibility, jurisdiction, authority, interest, claim, ownership.
kupuna	Grandparent, ancestor; kūpuna is the plural form.
kū‘ula	A stone god used to attract fish, an altar near the sea, or a hut where fishing gear was kept with kū‘ula images to invoke their power.
lauhala	Leaf of the hala, or pandanus tree (<i>Pandanus odoratissimus</i>), used for matting and basketry.
lele	A detached part or lot of land belonging to one ‘ili, but located in another ‘ili.
limu	Refers to all sea plants, such as algae and edible seaweed.
lo‘i, lo‘i kalo	An irrigated terrace or set of terraces for the cultivation of taro.

loko	Inside, interior. Pond, lake, pool.
loko i'a kalo	Pond for both fish and taro cultivation.
loko wai	Freshwater lake or pond.
lū'au	Hawaiian feast, named for the taro tops always served at one; this is not an ancient name, but goes back to at least 1856.
makai	Toward the sea.
Māhele	The 1848 division of land.
maka'āinana	Common people, or populace; translates to "people that attend the land."
mākāhā	A fishpond sluice gate.
māmaki	<i>Piptarus</i> spp., a small native tree. Fiber from its bark was used to make a kind of coarse tapa. Sometimes spelled mamake in old texts.
mauka	Toward the mountains.
mele	Song, chant, or poem.
mo'olelo	A story, myth, history, tradition, legend, or record.
naio	<i>Myoporum sandwicense</i> , the bastard sandalwood native to Hawai'i.
niuhi	Man-eating shark; any shark more than 3.5 m long is probably a niuhi. Catching the niuhi was a sport of chiefs.
'ōhi'a 'ai	The mountain apple tree, <i>Eugenia malaccensis</i> , a forest tree that grows to 50 ft high.
'ōhi'a lehua	The native tree <i>Metrosideros polymorpha</i> , the wood of which was utilized for carving images, as temple posts and palisades, for canoe spreaders and gunwales, and in musical instruments.
'ōlelo no'eau	Proverb, wise saying, traditional saying.
oli	Chant.
olonā	The native plant <i>Touchardia latifolia</i> , traditionally used for making cordage.
paniwai	Levee, dam, sluice, dike.
pili	A native grass, <i>Heteropogon contortus</i> .
pōhuehue	The beach morning glory, <i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i> , used medicinally. Vines are also used to drive fish into nets.
post-contact	After A.D. 1778 and the first written records of the Hawaiian Islands made by Captain James Cook and his crew.
pre-contact	Prior to A.D. 1778 and the first written records of the Hawaiian Islands made by Captain James Cook and his crew.
pueo	The Hawaiian short-eared owl, <i>Asio flammeus sandwichensis</i> , a common 'aumakua.
pu'u	Hill, mound, peak.
pu'uone	Pond near the seashore, as at the end of a stream; divination.
ti (kī)	The plant <i>Cordyline terminalis</i> , whose leaves were traditionally used in house thatching, raincoats, sandals, whistles, and as a wrapping for food.
'uala	The sweet potato, or <i>Ipomoea batatas</i> , a Polynesian introduction.

uhiuhi	The endemic tree <i>Mezoneuron kauaiense</i> , a legume with pink or red flowers and winged pods. It produces a hard, heavy wood that was used for hōlua sleds, spears, digging sticks, and house posts in ancient times.
umu	Furnace or oven; a pile of rocks placed in the ocean to attract small fish. More commonly called imu.
wauke	The paper mulberry, or <i>Broussonetia papyrifera</i> , which was made into tapa cloth in traditional Hawai'i.

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