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TIMOTHY F. T. HIU
DEPUTY DIRECTOR

2017/ED-12(WA)

December 13, 2017

RECEIVED
'17 DEC 13 P1:30
OFC. OF ENVIRONMENTAL QUALITY CONTROL

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

Dear Mr. Glenn:

SUBJECT:	Special Management Area Ordinance Chapter 25, Revised Ordinances of Honolulu Draft Environmental Assessment (DEA)
Project:	Kaaawa Fire Station Communication Facility Improvements and Tower Replacement Project No. II-22-15-C
Applicant:	City and County of Honolulu, Department of Information Technology (Mark D. Wong) City and County of Honolulu, Department of Design and Construction (Robert J. Kroning)
Agent:	R.M. Towill Corporation (Laura Mau)
Location:	51-518 Kamehameha Highway - Koolauloa
Tax Map Key:	5-1-001: 051 (Portion)
Proposal:	Special Management Area-Major (SMA) to replace an existing 100-foot tri-pod communications tower with a new, four-sided 120-foot self-supporting communications tower and accessory uses and structures. The Major SMP is necessary because Minor SMAs are restricted to $500,000 of development at a single facility annually.

We respectfully request publication of the Project summary of the DEA in the next edition of "The Environmental Notice", on **December 23, 2017**. Enclosed are one hard copy and one electronic copy of the DEA and the Publication Form. The Publication Form, including Project summary, was also sent via electronic mail to your office.

18-253

Should you have any questions, please contact William Ammons at 768-8025 or via email at wammons@honolulu.gov.

Very truly yours,

FOR Kathy K. Sokugawa
Acting Director

Enclosures: DEA, one hard copy and one disk
One copy of OEQC Publication Form

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

Project Name:	**Kaaawa Fire Station Communication Facility Improvements and Tower Replacement Project No. II-22-15-C**
Applicable Law:	Chapter 25, Revised Ordinances of Honolulu
Type of Document:	Draft Environmental Assessment
Island:	Oahu
District:	Koolauloa
TMK:	5-1-001: 051(Portion)
Permits Required:	Special Management Area Permit (Major) Conditional Use Permit (Minor) Zoning Waiver Building Permits
Approving Agency:	City and County of Honolulu Department of Planning and Permitting 650 South King Street, 7th Floor Honolulu, Hawaii 96813 Contact: William Ammons (808) 768-8025
Applicant:	City and County of Honolulu Department of Information Technology 650 South King Street, 5th Floor Honolulu, Hawaii 96813 Contact: Mark D. Wong, Director (808) 768-8888 City and County of Honolulu Department of Design and Construction 650 South King Street, 11th Floor Honolulu, Hawaii 96813 Contact: Robert J. Kroning, P. E., Director (808) 768-8480
Consultant:	R. M. Towill Corporation 2024 North King Street, Suite 200 Honolulu, Hawaii 96819-3494 Contact: Laura Mau (808) 842-1133
Status:	Draft Environmental Assessment

Project Summary: The City and County of Honolulu Department of Information Technology and Department of Design and Construction propose to apply for a Major Special Management Area Permit (SMP) to replace an existing 100-foot tri-pod communications tower with a new, four-sided

120-foot self-supporting communications tower. The Major SMP is necessary because Minor SMPs are restricted to $500,000 of development at a single facility annually.

The Project also involves installation of a new seven-foot chain-link fence, renovation of the existing equipment building, relocation of propane tank, new waveguide bridge, replacement and expansion of the existing generator building, new fuel dispenser, fuel tank replacement, and accessory improvements. The proposed action is not anticipated to result in significant impacts to environmental resources. The implementation of standard Best Management Practices will ensure no significant impacts.

Doc 1540218

Draft Environmental Assessment

Prepared and Submitted in Accordance with
Chapter 25, Revised Ordinances of Honolulu, Special Management Area

Ka‘a‘awa Fire Station Communications Facility Improvements and Tower Replacement Project

Island of O‘ahu, State of Hawai‘i

Prepared for:

Department of Information Technology
City and County of Honolulu
650 South King Street, 5th Floor
Honolulu, Hawai‘i 96813

and

Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawai‘i 96813

November 2017

R. M. TOWILL CORPORATION
SINCE 1930
2024 N. King Street, Suite 200
Honolulu, Hawai‘i 96819-3494
Project No. 1-22571-03P

Draft Environmental Assessment

Prepared and Submitted in Accordance with
Chapter 25, Revised Ordinances of Honolulu, Special Management Area

Ka‘a‘awa Fire Station Communications Facility Improvements and Tower Replacement Project

Island of O‘ahu, State of Hawai‘i

Prepared For:
Department of Information Technology
City and County of Honolulu
650 South King Street, 5th Floor
Honolulu, Hawai‘i 96813

and

Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
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Prepared By:
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Project No. 1-22571-03P

November 2017

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APPENDIX B Draft Archaeological Assessment Study for the Ka‘a‘awa Fire Station Facility Improvements and Tower Replacement Project, Ka‘a‘awa Ahupua‘a, Ko‘olauloa District, O‘ahu, TMK: [1] 5-1-011:051 por., Prepared by Cultural Surveys Hawai‘i, Inc., August 2017.

APPENDIX C Letter from State Historic Preservation Division Accepting Archaeological Assessment Study, September 11, 2017.

APPENDIX D Certificate of Categorical Exclusion for Antenna Installations, June 29, 2017

APPENDIX E Record of Consultations: Ka‘a‘awa Community Association Meeting, December 13, 2016; Ko‘olauloa Neighborhood Board No. 28, January 12,2017; and Ka‘a‘awa Community Association Meeting, March 14, 2017.

APPENDIX F Declaration of Exemption, by City and County of Honolulu, Department of Information Technology and Department of Design and Construction, Signed October 12, 2017.

ACRONYMS

BMPs	Best Management Practices
BWS	Honolulu Board of Water Supply, City and County of Honolulu
City	City and County of Honolulu
dBA	Decibels, Adjusted
DDC	Department of Design and Construction, City and County of Honolulu
DEA	Draft. Environmental Assessment
DLNR	State Department of Land and Natural Resources, State of Hawai‘i
DOH	Department of Health, State of Hawai‘i
DOT	Department of Transportation, State of Hawai‘i
DPP	Department of Permitting and Planning, City and County of Honolulu
DPR	Department of Parks and Recreation, City and County of Honolulu
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FCC	Federal Communications Commission
FEA	Final Environmental Assessment
FONSI	Finding of No Significant Impact
GP	General Plan, City and County of Honolulu
HAR	Hawai‘i Administrative Rules, State of Hawai‘i
HFD	Honolulu Fire Department, City and County of Honolulu
HoLIS	Honolulu Land Information System, City and County of Honolulu
HRS	Hawai‘i Revised Statutes, State of Hawai‘i
KFS	Ka‘a‘awa Fire Station
KLSCP	Ko‘olau Loa Sustainable Communities Plan
LUO	Land Use Ordinance, State of Hawai‘i
MS4	Municipal Separate Sewer System, City and County of Honolulu
NPDES	National Pollutant Discharge Elimination System
OEQC	Office of Environmental Quality Control, State of Hawai‘i
OP	Office of Planning, State of Hawai‘i
ROH	Revised Ordinances of Honolulu, City and County of Honolulu
SHPD	State Historic Preservation Division, DLNR, State of Hawai‘i
SMA	Special Management Area
TMK	Tax Map Key

1.0 PROJECT SUMMARY

Project:	Ka‘a‘awa Fire Station Communication Facility Improvements and Tower Replacement Project No. II-22-15-C
Applicant:	Department of Information Technology City and County of Honolulu 650 South King Street, 5th Floor Honolulu, Hawai‘i 96826 Contact: Mark D. Wong, Director Phone: (808) 768-7684 Department of Design and Construction City and County of Honolulu 650 South King Street, 11th Floor Honolulu, Hawai‘i 96813 Contact: Robert J. Kroning, Director Phone: (808) 768-8480
Approving Agency:	Department of Planning and Permitting City and County of Honolulu 650 South King Street, Seventh Floor Honolulu, Hawai‘i 96813
Agent:	R. M. Towill Corporation 2024 North King Street, Suite 200 Honolulu, Hawai‘i 96819 Contact: Laura Mau Phone: (808) 842-1133
Tax Map Key:	(1) 5-1-011: 051 (Portion)
Location:	Ka‘a‘awa Fire Station (Number 21) at 51-518 Kamehameha Highway, Ka‘a‘awa HI 96730 This project site is located approximately 500 ft. from the nearest coastline.
Proposed Action:	The City and County of Honolulu, Department of Information Technology and Department of Design of Construction propose to replace an existing, structurally deficient 100-foot (ft.) tri-pod communications tower with a new, four-sided 120-ft. self-supporting communications tower, renovate the existing equipment and expand the existing generator building.
Land Area:	Parcel area = 12,514 square feet (sf.) Project area = approximately 2,700 sf.
State Land Use District:	Urban
County Zoning:	Residential (R-5)
(Continued)	

Project Summary (Continued)	
Existing Land Use:	Communications Tower and Related Appurtenances Adjacent to Tower: Ka‘a‘awa Fire Station
Special Management Area:	Within Special Management Area
Permits and Other Regulatory Clearances that May be Required:	City and County of Honolulu: • Special Management Area Permit • Conditional Use Permit - Minor • Height Waiver • Construction Plan Review and Approval • Building Permit • Certification of Categorical Exclusion for Antenna Installation (Approved on June 29, 2017) State of Hawai‘i: • Hawai‘i Revised Statutes (HRS), Chapter 343, Environmental Assessment (Declaration of Exemption approved on October 12, 2017) • Consultation pursuant to HRS, Chapter 6E, Part 1. Historic Program

2.0 INTRODUCTION AND OVERVIEW

The City and County of Honolulu (City) Department of Information Technology (DIT) and the Department of Design and Construction (DDC) propose to replace an existing, structurally deficient 100-foot (ft.) tri-pod communications tower with a new, four-sided 120-ft. self-supporting communications tower. In addition, the existing equipment building will be renovated and the existing generator building will be expanded. A new seven ft. high chain link fence with barbed wire and gates will be erected to secure the new communications tower and allow controlled access for maintenance personnel. The existing tower is located adjacent to the Ka'a'awa Fire Station (KFS) No. 21 at 51-518 Kamehameha Highway. The project site is located entirely within the Special Management Area (SMA), and is approximately 500 ft. from the nearest coastline. See **Figure 2-1 Project Location Map, Figure 2-2 Special Management Area, Figure 2-3 Existing Site Plan, Figure 2-4 Proposed Site Plan, and Photographs 2-1 to 2-2 showing Views of the Existing Tower**.

The existing tower requires replacement due to the advanced deterioration of its structural members as indicated in an assessment report prepared by Tower Engineering Company in December 2014. See **Appendix A**, Tower Repair Report. The City completed temporary repairs, including strengthening steel post supports with concrete and replacing portions of the steel frame bracing, in order to extend the life of the tower until funds became available for its replacement. These repairs are not intended to restore the existing tower to its original strength; therefore, a new tower is required as a long-term solution. Furthermore, the communications tower at KFS serves as a critical link in the City and County of Honolulu's (CCH) loop microwave radio system. The loop microwave system utilizes microwave transmission technology for point-to-point communications, primarily for the purposes of dispatching emergency medical and public safety response and management services by City first responders. Further discussion is provided in Section 3.0 Purpose and Need for the Project.

The Project will provide public benefits by ensuring the continuation of the CCH vital public safety and communication system. Short-term benefits will also be realized in the form of construction jobs. The Project further implements the CCH vision for the maintenance of a high level of service for all utilities as outlined in Section V of the City and County of Honolulu General Plan (1992 edition, amended in 2002). See Section 9.4 of this DEA for further discussion.

This Draft Environmental Assessment (DEA) is prepared pursuant to and in accordance with the

requirements of the Revised Ordinances of Honolulu (ROH), Chapter 25, Special Management Area, which governs the issuance of permits for development within the SMA. Section 25-3.3(c)(1) stipulates that any proposed development requiring an SMA use permit (SMP) is subject to an assessment by the agency in accordance with the procedural steps set forth in Hawai'i Revised Statutes (HRS), Chapter 343, Environmental Impact Statements even if it does not involve one of the official Chapter 343 "triggers". Section 25-4.2 requires that in processing an EA being used in support of an SMP application, the director adhere to the procedures set forth in HRS, Chapter 343 and its implementing regulations set forth in the Hawai'i Administrative Rules (HAR), Title 11-200, Environmental Impact Statement Rules. The proposed action that triggers the EA is the proposed development within the SMA.

Figure 2-1, Project Location Map

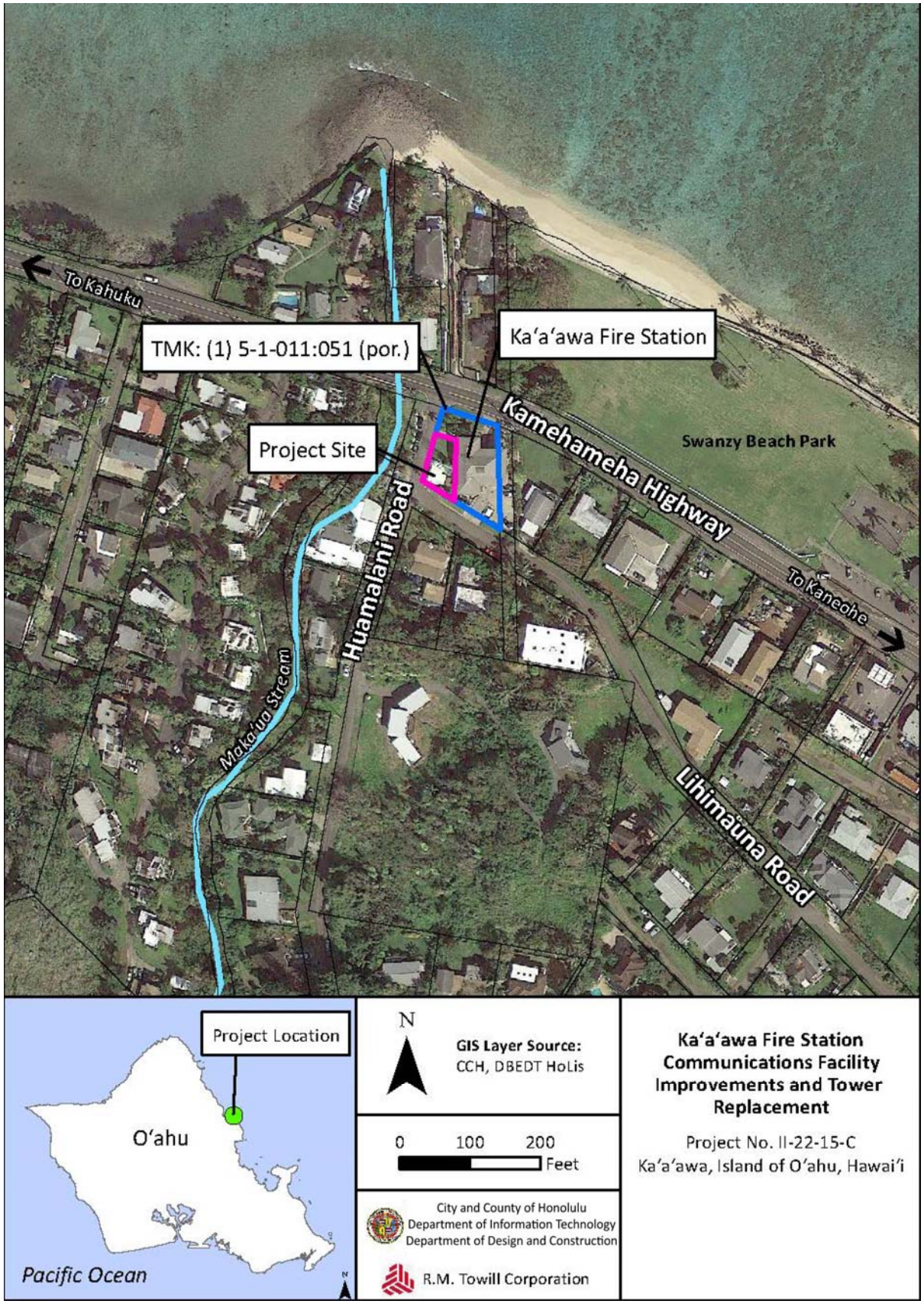


Figure 2-2, Special Management Area

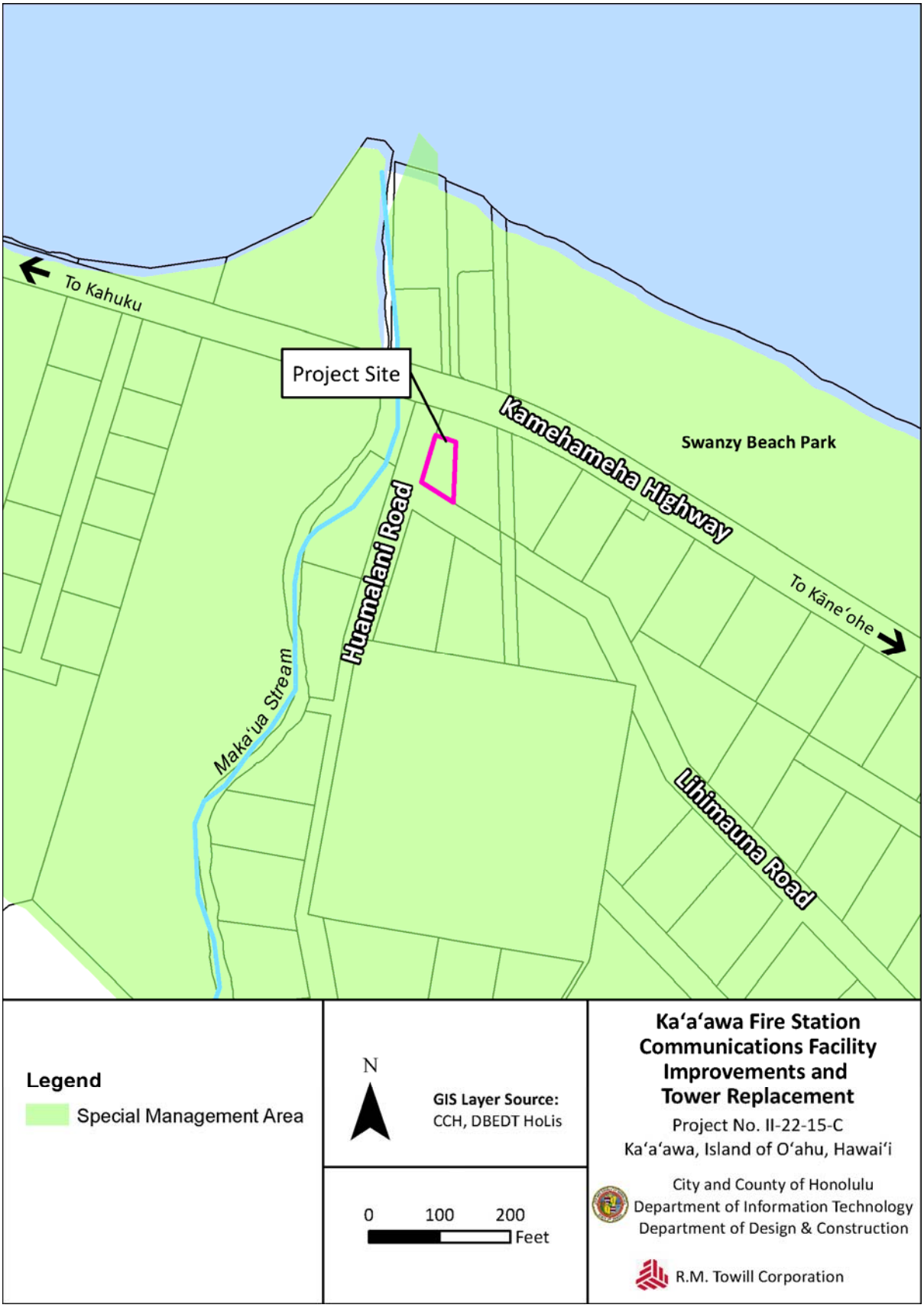


Figure 2-3, Existing Site Plan

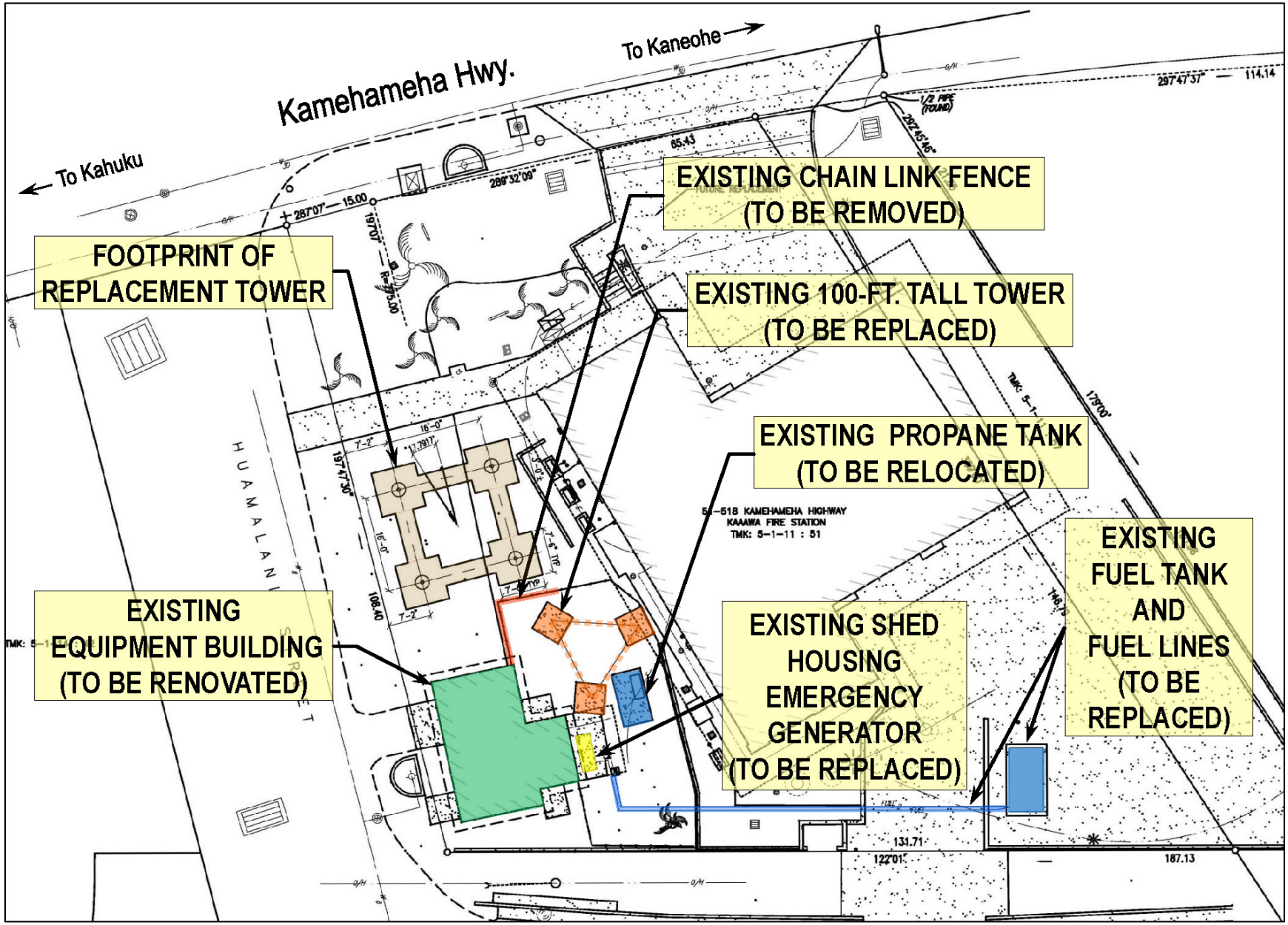
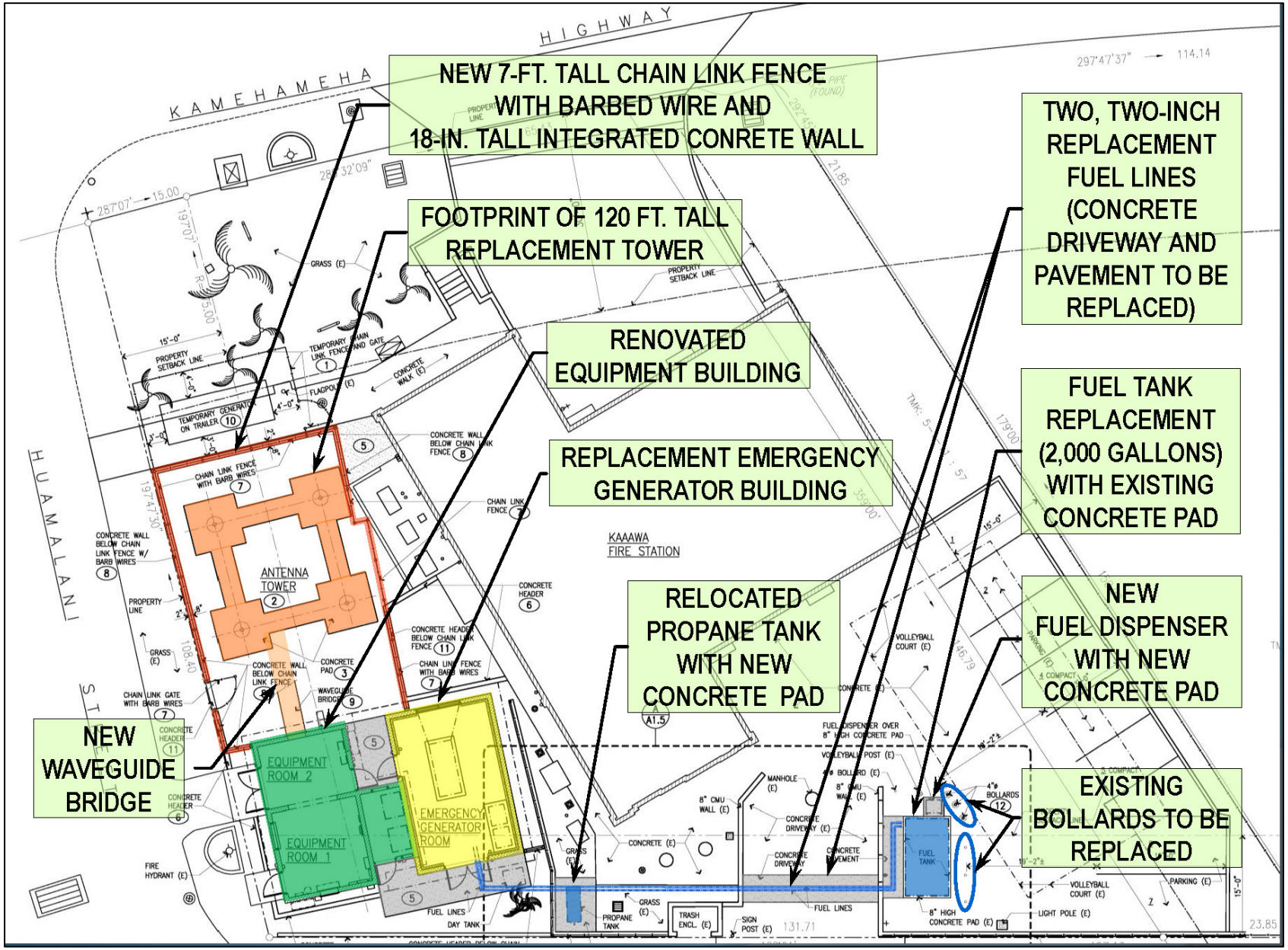


Figure 2-4, Proposed Site Plan



Photographs 2-1 and 2-2 —Views of Existing Antenna Tower Site

3.0 PURPOSE AND NEED FOR THE PROJECT

The purpose of the Project is to replace the existing tower due to the advanced deterioration of its structural members as indicated in the Tower Repair Report prepared by Tower Engineering Company (TEC) in December 2014. See **Photographs 3-1 and 3-2, Existing Tower Conditions, and Appendix A, Tower Repair Report**. Throughout the years, the City has completed temporary repairs, including installing concrete to support steel posts and replacing portions of the steel frame bracing. However, these repairs were not permanent, nor were they intended to restore the existing tower to its original strength. Therefore, a new, replacement tower is required as a long-term solution.

The existing communications tower was built in 1988 at the KFS property, and is part of a loop microwave radio system that encircles the island of O‘ahu. See **Figure 3-1, Public Safety Communications System: Island of O‘ahu**. It is included among a system of 19 interconnected communications towers on-island, including sites at the following locations:

1. Ka‘a‘awa Fire Station
2. Aikahi Radio Station
3. Kailua Police Station
4. Waimānalo
5. Koko Head
6. Leahi Hospital
7. Round Top
8. Honolulu Frank Fasi Municipal Building
9. Sand Island
10. Aliamanu
11. Pu‘u Manawahua
12. U.S. Navy
13. Mokuleia (Pahole)
14. Kawela
15. Kahuku Police Station

The loop microwave system utilizes microwave transmission technology for point-to-point communications, primarily for the purposes of dispatching emergency medical and public safety response and management services by the Honolulu Fire Department (HFD), Honolulu Police Department (HPD), Emergency Services Department, Department of Ocean Safety, and the Department of Emergency Management. Other agencies that use the system for communications purposes include the DIT, City Department of Transportation for TheBus, City Board of Water Supply, and the State of Hawai‘i Department of Transportation.

The Ka‘a‘awa Fire Station communications tower is the only tower providing a link between the Kahuku Police Station and the Aikahi Radio Station, located approximately 13 miles northwest and approximately 14 miles southeast from the project site, respectively. The tower is critical to maintaining communication service along the windward coast as it provides the only local radio communication for emergency services in the towns of Ka‘a‘awa, Kahana, Punalu‘u, Hau‘ula, Lā‘ie, and parts of Kahuku.

This system utilizes microwave transmission for point-to-point communications, primarily for the purposes of dispatching of emergency medical and public safety services, which includes police, fire, and ambulance vehicles and helicopters. Since there are a limited number of ambulances, fire trucks, police cars, and helicopters for approximately 953,207 inhabitants on O‘ahu,[1] it is especially critical that such limited emergency response resources are dispatched as expediently and with as much accuracy as possible. When 9-1-1 is dialed on O‘ahu, the

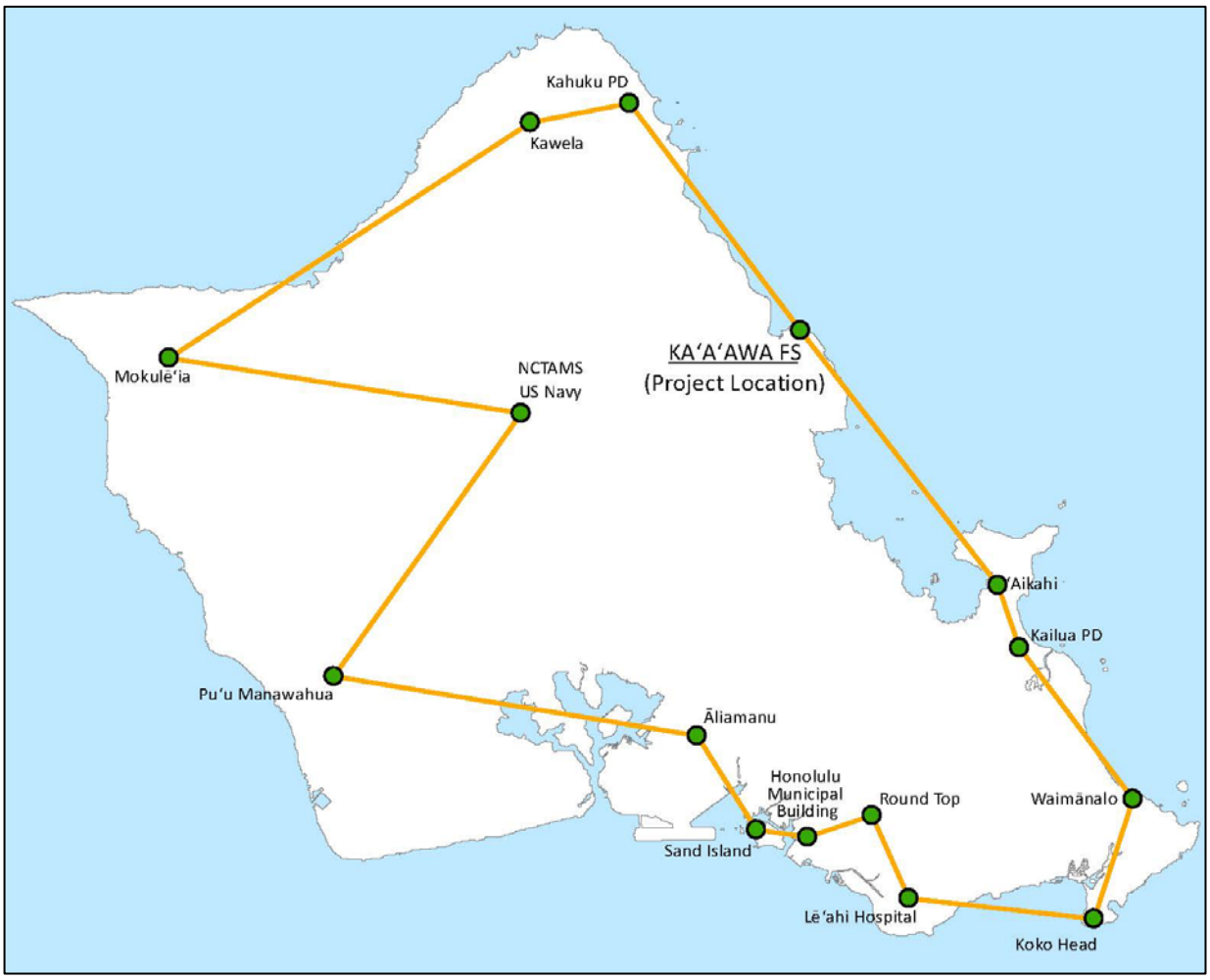
Photograph 3-1, Diagonal Deterioration at the 60-FT Elevation

Photograph 3-2, Advanced Corroded Condition at Splice

individual communications towers on-island selectively pick up and route information to pin point the exact location of the caller and can then dispatch emergency responders based on that information. While communications towers utilizing this microwave technology have the advantage of being able to pick up uninterrupted frequencies and transmit and receive large amounts of information, they are also typically limited to a line-of-sight propagation and therefore cannot pass around hilly and mountains landscapes. In other words, if it is not possible to visually see a transmitting antenna, it is not possible to receive a radio signal from it.

The new tower will be critical to maintain continued communication service along the windward coast. If the new tower is not constructed, tower repairs will be required on a recurring basis or the existing tower will continue to deteriorate and lose structural integrity. This may result in future potential interruption to the island-wide communication system, which will affect the emergency response time for the windward coast area.

Figure 3-1, Public Safety Communications System: Island of O'ahu



4.0 PROJECT DESCRIPTION

4.1 LOCATION

The project site is located adjacent to the KFS No. 21 at 51-518 Kamehameha Highway and identified by Tax Map Key (TMK) (1) 5-1-011: 051 (portion). **See Figure 2-1, Project Location**. The entire property is approximately 12,514 square feet (sf).

The project is located within the town of Ka‘a‘awa, which is in within the Maka‘ua 1 Ahupua‘a. Ka‘a‘awa is situated along the windward coastline of O‘ahu approximately 13 miles north of Kāne‘ohe and approximately 14 miles south of Kahuku. The main arterial roadway fronting the project is Kamehameha Highway which connects Ka‘a‘awa to the rest of coastal northeastern O‘ahu.

Uses surrounding the project site include low density single-family housing, Swanzy Beach Park to the north, a small commercial center to the east, and Makua Stream to the west. Agricultural uses are located near the southern end of Ka‘a‘awa town, mauka of the Kamehameha Highway. No major commercial uses exist in Ka‘a‘awa as it is a rural community. Similarly, its neighboring communities are rural in nature.

4.2 SUMMARY OF TECHNICAL CHARACTERISTICS

The project site features an existing, unmanned communications tower that is part of a loop microwave radio system that encircles the island of O‘ahu. The loop system is comprised of 15 individual communication sites listed below and depicted in **Figure 3-1, Public Safety Communications System: Island of O‘ahu**.

The loop microwave system utilizes microwave transmission technology for point-to-point communications, primarily for the purposes of dispatching emergency medical and public safety response and management services, as well as for communications between various City Departments as described in Section 3.0 Purpose and Need for the Project.

The Ka‘a‘awa Fire Station communications tower is the only tower providing a link between the Kahuku Police Station and the Aikahi Radio Station, located approximately 13 miles northwest and approximately 14 miles southeast from the project site, respectively. The tower is critical to maintaining communication service along the windward coast as it provides the only local radio communication for emergency services in the towns of Ka‘a‘awa, Kahana, Punalu‘u, Hau‘ula, Lā‘ie, and parts of Kahuku.

4.2.1 Existing Uses

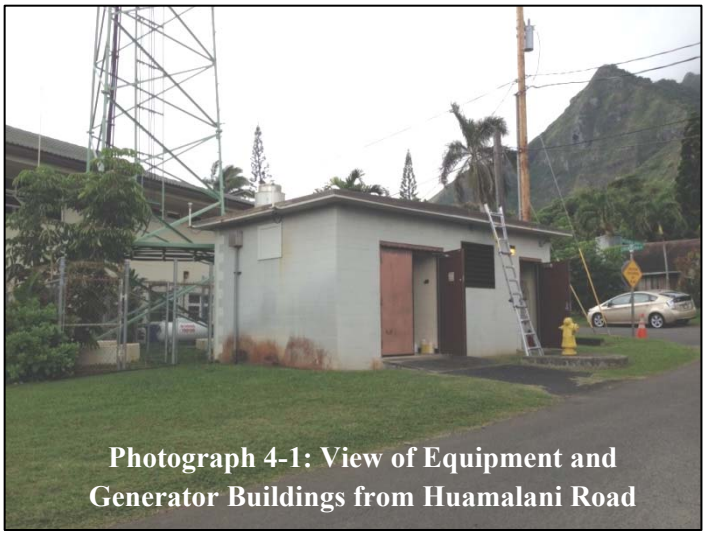
Communications Tower

The existing communications tower is a 100-ft. tall steel frame structure supported by a triangular base width of approximately 14½ ft., which tapers to approximately 6½ ft. at the 80 ft. level and continues to the uppermost 20 ft. section. The existing communications tower sits atop a 16-ft triangular footprint. The tower is set back approximately 80 ft. from Kamehameha Highway. Tower members are hollow pipe legs with single angle diagonals and horizontals. Several types of equipment are mounted on

the tower, including two 8-ft. diameter microwave dishes, a 6-ft. diameter microwave dish, and multiple mast and Yagi antennas. The existing tower requires replacement due to the advanced deterioration of its structural members. See **Appendix A, Tower Repair Report.**

Equipment Building and Generator Shed

An enclosed structure located outside of the chain link fence contains the main generator and equipment used for communications tower operations. The main generator and equipment building is approximately 24 ft. by 14 ft. in area with an attached electrical room that is 11 ft. 4 inches by 6 ft. 8 inches in area, with a total combined floor area of approximately 410 square feet (sf.) under roof. The existing building is approximately 9 ft. 4 inches high to the bottom of the flat, concrete roof. A 7-ft. chain link fence topped with barbed wire encloses the perimeter of the existing communications tower, propane fuel storage tank and an adjacent shed that houses the emergency backup generator. The shed is approximately 11 ft. long by 8 ft. wide with an enclosed area of 15 sf. The communication tower equipment is powered by overhead electrical lines operated Hawaiian Electric Company (HECO). The emergency generator is fueled via two underground lines connected to an existing above-ground fuel tank located at the back of the fire station. See **Photographs 4-1 and 4-2, Existing Equipment and Generator Building from Huamalani Road and Lihimauna Streets**.



Photograph 4-1: View of Equipment and Generator Buildings from Huamalani Road

Photograph 4-2: Equipment Building and Generator Shed from Lihimauna Street

4.2.2 Proposed Structures

New Communications Tower

The new communications tower will be located immediately northwest and makai of the existing tower, and will feature four steel rod legs spaced approximately 20 ft. apart at the base, gradually narrowing to approximately 8 ft. apart at the top. Four steel leg posts will support the tower, and will be anchored by four reinforced concrete micropile caps, each measuring 9 ft. square by 6½-ft. deep. Each micropile cap will include a pedestal and twelve micropiles drilled to a depth of

approximately 35 ft. beneath the existing grade. The new tower will host a total of three microwave dishes, waveguide bridge and antennas, and security camera system.

The new communication tower is designed to comply with the Telecommunications Industry Association (TIA) Structural Standard for Supporting Structures and Antennas version G, Addendums 1 and 2 (TIA-222-G) and the International Building Code 2012 (IBC). The TIA-222-G requires that communications towers be designed to survive the most critical loading combination they are exposed to, which is based on load, resistance, and topographic considerations. The proposed communications tower is designed to withstand a load combination of 160 miles per hour (mph), which exceeds the Saffir-Simpson Hurricane Wind Scale for a Category 4 Hurricane which is associated with winds of up to 155 mph. The new communications tower is also designed to resist seismic movement for a Class III structure. This seismic resistance class is based on the purpose and use of the new tower to provide emergency communications services. **See Figure 4-1 Proposed Tower Elevations, and Figure 4-2 Tower Foundation Plan and Pile Cap Details.**

Renovated Equipment and Expanded Generator Building

The equipment building will be renovated and expanded to include a new room that will house houses the emergency generator. The new building will be expanded by approximately 384 sf. to provide a total area of approximately 794 sf. under roof. It will feature new door frames, doors, louvers, a new concrete roof and an additional room to house a new emergency generator, in addition to the main generator, and equipment to support the communications tower. The new room will be 24 ft. by 16 ft. with a height of 10 ft. 8 inches to the bottom of the flat roof slab. The existing above-ground fuel tank located at the back of the Fire Station will be replaced with a new, 2,000-gallon above-ground fuel tank. Two existing, two-inch underground fuel lines that connect the fuel tank to the main and emergency generators will be replaced. The existing propane fuel storage tank will be salvaged for re-use on site near the existing fire station. The existing shed structure that houses the emergency generator will be demolished and removed. A 7-foot high perimeter chain link fence topped with barbed wires and integrated with a 27-inch high concrete wall will surround the tower. **Figure 4-3 Proposed Exterior Elevations**.

4.2.3 Construction Characteristics

The Project will require removal of the existing tower, excavation for the placement of the new tower, modifications to the existing equipment building, and expansion of the existing generator room to house the new emergency generator room. The Project will be completed in three phases during which the existing communications tower antennas, microwave dishes, and equipment must remain in operation to support critical communications by public agencies and emergency responders. The general contractor must complete each phase before moving onto the subsequent phase of construction. For each phase of construction, the contractor will install a temporary construction barricade to control site access and will install best management practices (BMPs) to control storm water runoff.

Phase 1 – Construction of New Communication Tower

The existing landscaping will be removed and the new communications tower site will be graded. Four new concrete pile caps mearing will be installed, each of which will reinforced with twelve drilled micropiles to a depth of approximately 35 ft. below existing grade, followed

Figure 4-1, Proposed Tower Elevations

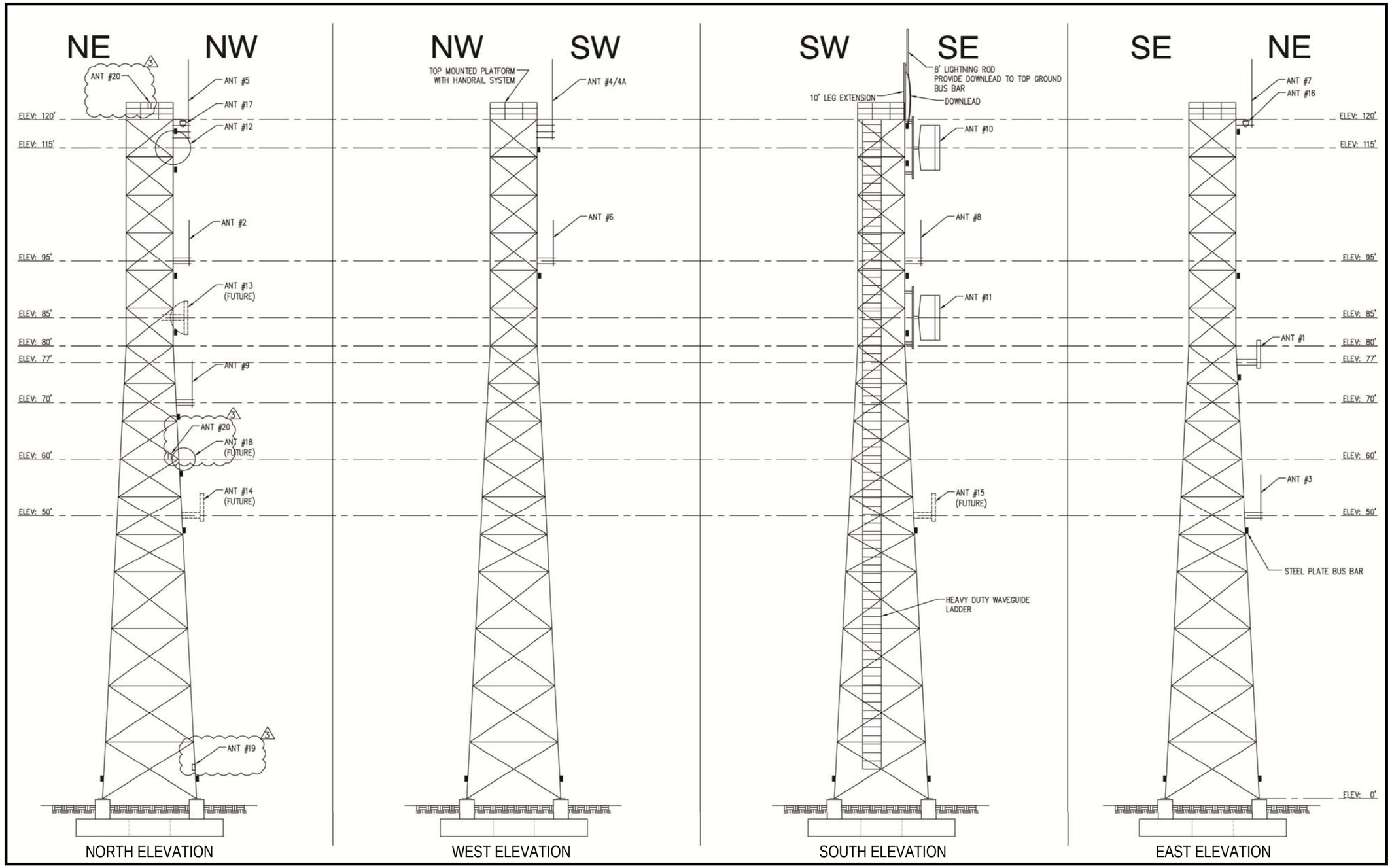


Figure 4-2, Tower Foundation Plan and Pile Cap Details

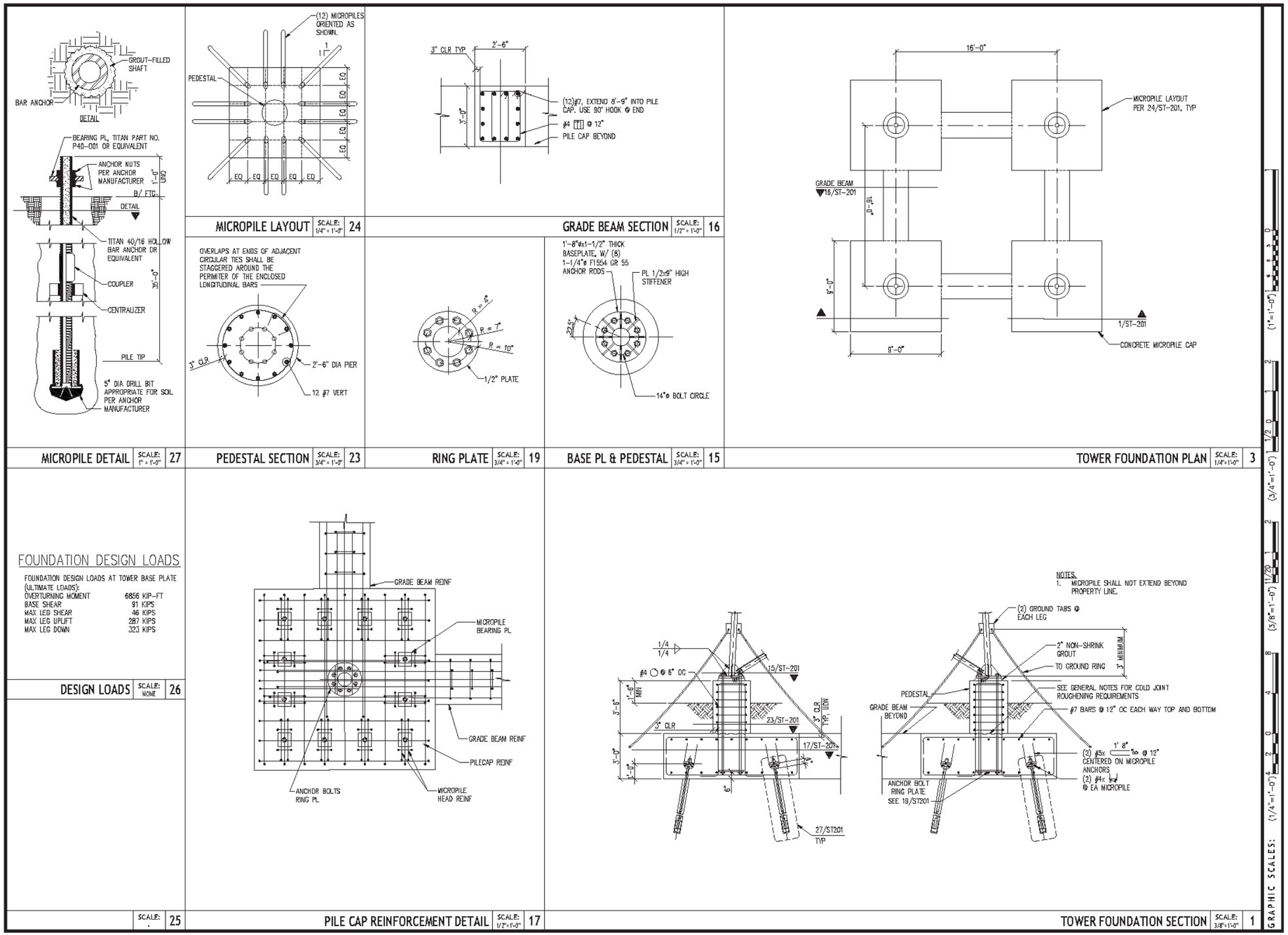
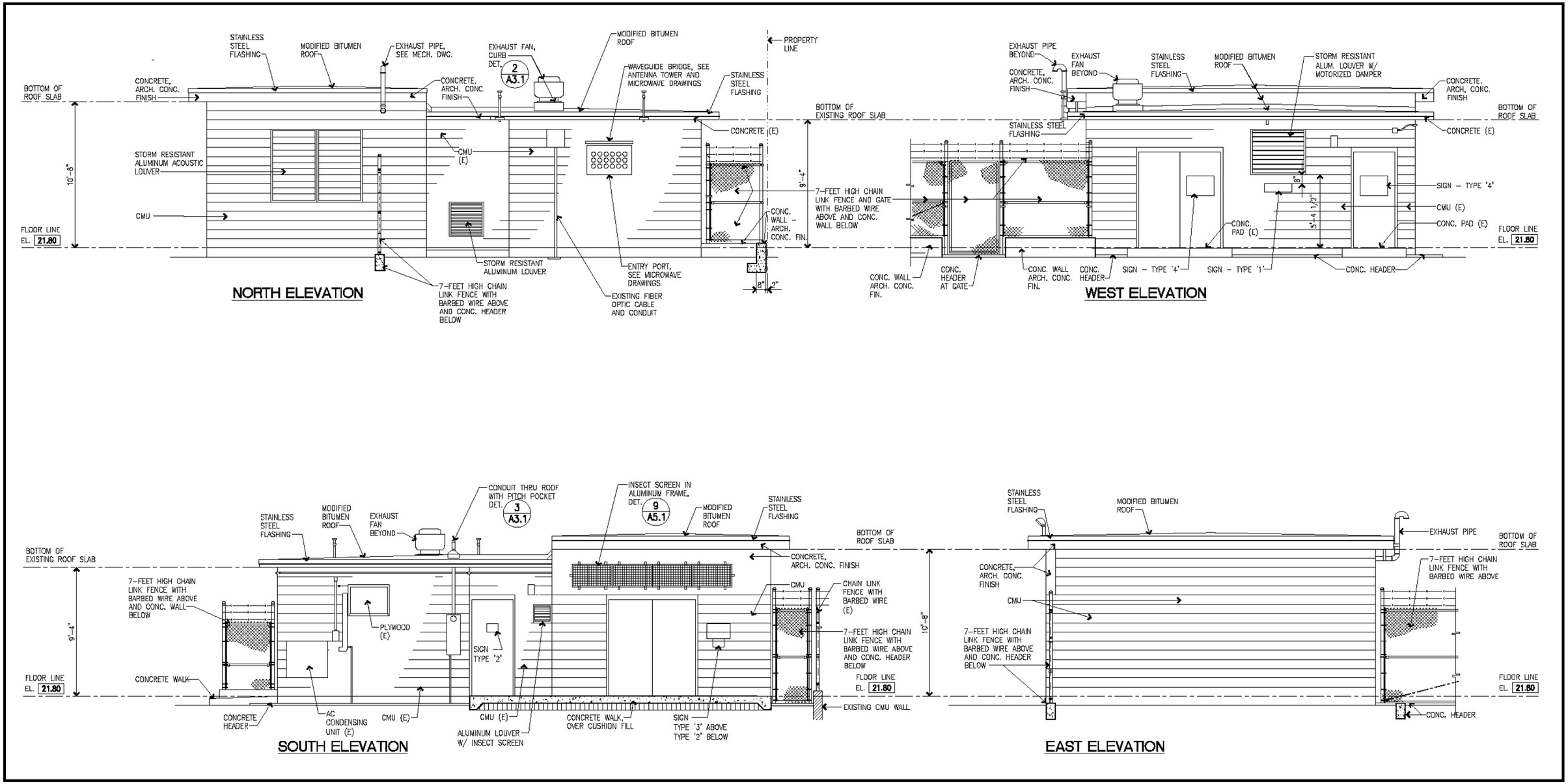


Figure 4-3, Renovated Equipment and New Generator Building - Proposed Exterior Elevations



by construction of the new 120-ft. tall steel framed antenna tower and installation of up to 20 antenna and microwave dishes. A new 7-ft. high chain link fence with barbed wire and gates will be erected to enclose the new communications tower. A new security camera system will be installed. The site soils will be stabilized by placement of gravel.

Phase 2 – Demolition of Existing Tower and Emergency Generator Structure

This phase shall not proceed until Phase 1 is completed and accepted by the City, as service from the old communications tower will remain in operation. Once the new communications tower is deemed acceptable by the City, service from the existing communications tower will be transferred to the new communications tower. A temporary emergency generator will be installed for use during Phases 2 and 3 as the communications tower and equipment and generator building will require an alternative method of powering until the project is complete. Thereafter, the two existing, two-inch fuel lines servicing the existing equipment and generator shed will be cut and capped and removed by trench excavation. In addition, the propane fuel storage tank will be salvaged. Existing fuel tank attachments and the concrete pad that the tank sits on will be removed and relocated for re-use on the project site near the existing fire station. A new concrete pad will be constructed for the tank and it will be reconnected to the existing gas line. The existing communications tower will then be disassembled, including its 100-ft. tall steel framed legs, antennas, microwave dishes, waveguide bridge and concrete footings. The site will be regraded and prepared for construction of the emergency generator room addition to the existing equipment building.

Phase 3 – Renovation and Expansion of Existing Equipment and Generator Building

The existing equipment building will be renovated and the new generator room will be constructed on the old tower site. The original emergency generator shed will be demolished. Two new fuel lines will be constructed to connect the new emergency generator to the new, above-ground fuel tank. Once the work for this phase is completed, the temporary emergency generator will be removed, final landscaping will be installed, and temporary BMPs will be removed.

4.3 PHASING AND TIMING OF ACTION

Construction is anticipated to begin in mid-2018, and is estimated to take approximately 10 to 12 months to complete. The improvements will be completed in three phases as described above in Section 4.2:

- Phase 1: Construction of New Communication Tower will take approximately 6-7 months to complete.
- Phase 2: Demolition of Existing Tower and Emergency Generator Structure will take approximately 2-3 months to complete.
- Phase 3: Renovation and Expansion of Existing Equipment and Generator Building will take approximately 2-3 months to complete.

4.4 USE OF PUBLIC FUNDS OR LANDS AND PROJECT COST

The Project will involve the use of City funds. The estimated project cost is $3.2 million.

5.0 ALTERNATIVES

5.1 Alternative 1: No Action

Under the "No-Action" Alternative, resources in the form of financial capital, construction materials, and human labor required for planning, engineering, construction and operation and maintenance would not be expended. No disturbance to the project site would occur.

The existing system, which is limited in its remaining service life, will continue to be used. Various public agency users would continue to rely on the dated facility for transmitting data and voice communications is a risk. Deteriorating facilities render the overall communication system vulnerable to breakdowns in communication system and tower repairs will be required on a recurring basis. Because the facility serves a critical link between Kahuku and Aikahi, any break down in the system could potentially result in slower emergency response time.

Use of the limited and dated systems would not be in the public interest, and would potentially adversely affect the CCH communication system. Based on these considerations, the "No-Action" Alternative is not considered a feasible alternative.

5.2 Alternative 2: Construction of a New Communications Tower (Preferred Alternative)

The preferred alternative is to proceed with the Project involving the construction of a new 120-ft. tall communications tower, and improvements to the equipment and generator building featuring an emergency back-up generator. This option constitutes the preferred alternative because it is the only option that will fulfill the purpose of the project to provide communications services to emergency response personnel within the Ka'a'awa to Kahuku service area.

6.0 ENVIRONMENTAL SETTING, POTENTIAL EFFECTS AND MITIGATION MEASURES

6.1 CLIMATE

The project site is located along the eastern shoreline of O‘ahu and is generally characterized by moderate, subtropical temperatures. Ka‘a‘awa averages 74 inches (in.) of rain per year. Prevailing winds are northeasterly trade winds that blow directly on-shore off the ocean. Tradewinds occur 70 percent of the time, with a frequency range from approximately 45 percent in January to about 90 percent in July. Monthly average temperatures range from 70 degrees Fahrenheit in January to 78 degrees Fahrenheit in August. Average annual rainfall varies with elevation.

According to research conducted at the University of Hawai‘i (IPRC 2013, var.), the effects of climate change are increasingly evident in Hawai‘i: air temperature has risen; rain intensity has increased while total rainfall has decreased; stream flows have decreased; sea surface temperatures and sea levels have increased; and the ocean is becoming more acidic (SB No. 2745, 2012). Research is also in agreement that greenhouse gas emissions, including carbon dioxide, methane, nitrous oxide, and fluorinated gases, are a key contributor to the increases in global atmospheric warming over the past century (Environmental Protection Agency (EPA) 2011, IPRC 2013). These trends are projected to continue to increase in the future posing unique and considerable challenges to Hawai‘i. Research at the University of Hawai‘i, School of Ocean and Earth Science and Technology (SOEST) indicates that sea level has risen in Hawai‘i by approximately 0.6 inches per decade (1.5 mm per year) over the past century (SOEST, 2012). The estimates point to a potential aggregate rise of 1.3 feet (40 cm) by the year 2060 and a rise of 3.3 ft. (100 cm) by 2110.

Impacts and Mitigation Measures

The Project will not impact the regional climatic conditions. Climate change trends suggest increased potential for the windward side of O‘ahu, including the project corridor, to experience periods of sea level rise. To mitigate potential impacts from sea level rise, heavy rainfall and flooding events, work crews will secure the construction site as follows:

- Clean up all construction debris and soils.
- Secure equipment, machinery, and construction materials away from flood-prone locations.
- Inspect and secure construction BMPs, remove and replace any damaged trapped soils and debris from filter socks.
- Take other actions as necessary to minimize the potential for discharge of pollutants, sediment or debris from the project site, and to minimize potential damage in the event of flooding.

No further mitigation measures are required.

6.2 TOPOGRAPHY AND SOILS

The project site ground elevation is approximately between 19 ft. and 21 ft. above mean sea level (MSL). The site is generally flat with grades that gently slope northward towards Kamehameha Highway. The area is level; however, limited earthwork will be required to perform essential modifications to site grades and find adjustments to accommodate construction of the new communications tower. Over the main portion of the site, final elevations are generally expected to be consistent with the existing grade.

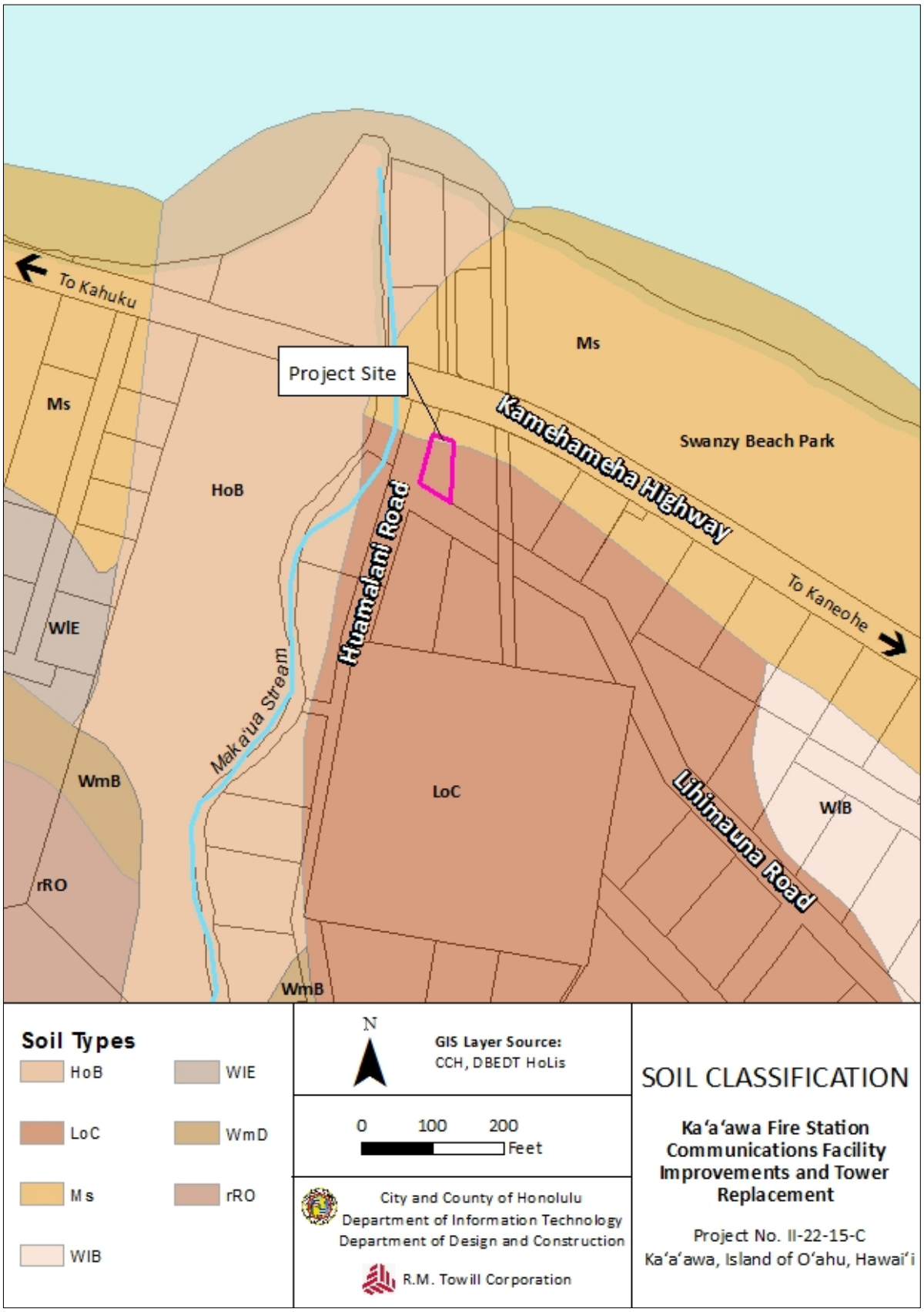
According to the U.S. Department of Agriculture Soil Survey of Island of Kaua'i, O'ahu, Maui, Moloka'i and Lāna'i, State of Hawai'i [1], the predominant soil type within the project site is Loleka'a silty clay loam, 8 to 15 percent slopes (LoC). LoC is characterized by slow to medium runoff, and has an erosion hazard that is slight to moderate. A smaller area of Mokuleia loam, 8 to 15 percent slopes (Ms), is located within the northern boundary of the site. In a representative soil sample, the Ms soil type is found to have moderate permeability in the surface layer and rapid permeability in the subsoil, runoff is very slow, and the erosion hazard is no more than slight. See **Figure 6-1 Soils Map**.

Impacts and Mitigation Measures

Construction of the Project will require drilled micropiles to approximately 35 FT deep to support the tower foundation and anchored nuts for the new communications tower. This will result in the disturbance of surface and subsurface soils, and displacement of the excavated soils. The Project will be designed and constructed to meet the requirements for seismic loading, grading, and stockpiling as set forth by the 2015 IBC, County and State regulatory requirements. If needed, imported fill will be limited to the use of clean and uncontaminated materials. Any graded or excavated material that cannot be reused will be disposed of at an approved waste facility in accordance with State and City regulations. Areas that are exposed as a result of earthwork will be properly handled using site-specific BMPs as required to ensure against the loss of sediment and soils due to storm water runoff. BMPs may include structural (e.g., berms, silt fences, barriers), vegetative (e.g., grass, mulch, ground cover, soil stabilization), and other management measures (e.g., project phasing and good housekeeping practices), as appropriate.

In the long-term, the Project will not cause significant elevation changes, and all construction activity will be stabilized with landscaped ground cover or gravel fill.

Figure 6-1, Soils Map



6.3 HYDROLOGIC RESOURCES

There are no surface water resources on the project site. The closest surface water to the project site is the Maka'ua Stream, and is identified by the State water quality standards mapping system as a non-perennial Class 2, Inland water body. Maka'ua Stream is located approximately 80 ft. west of the project site. During storm events, the banks of the Maka'ua Stream fill with rain water, eventually emptying into the Pacific Ocean. As a Class 2, Inland-designated water body, the Maka'ua Stream is designed to be maintained for recreational purposes, supporting and propagating aquatic life, agricultural and industrial water supply, shipping, and navigation. The Maka'ua Stream is typically dry and conveys water primarily during rainfall events.

The Pacific Ocean along the Ko'olau Loa coastline is designated as Class A, Marine Waters. According to HAR, Chapter 11-54, Water Quality Standards, Class A waters are designated for use for recreational purposes and aesthetic enjoyment.

Impacts and Mitigation Measures

The Project will not alter existing storm water runoff patterns nor will it adversely contribute adversely to the water quality in the Maka'ua Stream or the Pacific Ocean. BMPs will be implemented during construction activities to control storm water runoff and ensure adherence to HAR, Chapter 54, Water Quality Standards. Temporary BMPs, including the placement of gravel and landscaping with grass or groundcover plants, will be installed during construction to stabilize ground surfaces and prevent sediment discharge in storm water runoff. Upon completion of the project, storm water runoff from the project site will continue to flow in the existing pattern through on- and off-site drainage utilities.

6.4 OTHER NATURAL HAZARDS

6.4.1 Earthquakes

O'ahu does not have any active volcanoes; therefore, the island is not subject to significant earthquakes from volcanic activity. However, earthquakes are not uncommon in Hawai'i. Most earthquakes in the Hawaiian Islands are caused by volcanic activity on the island of Hawai'i, the Big Island. Earthquakes that reach O'ahu are generally not strong and cause little or no damage. One of the larger and more recent earthquakes occurred offshore of Puakō, Hawai'i. The earthquake measured 6.7 on the Richter scale and caused minor damages on the island of O'ahu. The IBC classifies likelihood of seismic activity into zones ranging from 0 to 4. Seismic Zone 0 represents no chance of severe ground shaking and Seismic Zone 4 represents a 10% chance of severe shaking in a 50-year interval. The IBC classifies O'ahu as Seismic Zone 2A.

Impacts and Mitigation Measures

The Project is not expected to impact earthquakes or the frequency of earthquakes in the Project area. However, there is the potential for an earthquake to occur during construction or operation. Therefore, all applicable Federal, State, and City requirements would be implemented to minimize impacts that may result during the construction of the Project. In addition, as a long-term measure, the proposed wastewater management facilities would be designed and constructed to meet Seismic Zone 2A requirements and

all applicable IBC and Federal, State, and CCH requirements. Back-up power supply would be available at the KFS to help prevent SSOs during emergencies and power outages.

To mitigate for potential effects of seismic activity, the proposed new communication tower is designed to comply with the TIA Structural Standard for Supporting Structures and Antennas version G, Addendums 1 and 2 (TIA-222-G) and the IBC 2012 (IBC). The TIA-222-G requires that communications towers be designed to survive the most critical loading combination they are exposed to, which is based on load, resistance, and topographic considerations. The proposed new communications tower is designed to resist seismic movement for a Class III structure. This seismic resistance class is based on the purpose and use of the new tower to provide emergency communications services.

6.4.2 Hurricanes

Heavy rains and strong winds associated with tropical storms occasionally impact the Hawaiian Islands and can cause flooding and major erosion. Hurricanes occasionally approach, but rarely reach the islands with hurricane force wind speeds. The most recent hurricane events included Iniki in 1992 which affected the islands of Kaua'i and O'ahu, and Iselle in 2014 which affected the Island of Hawai'i. The Project is not anticipated to be affected any more or less than other areas of the State.

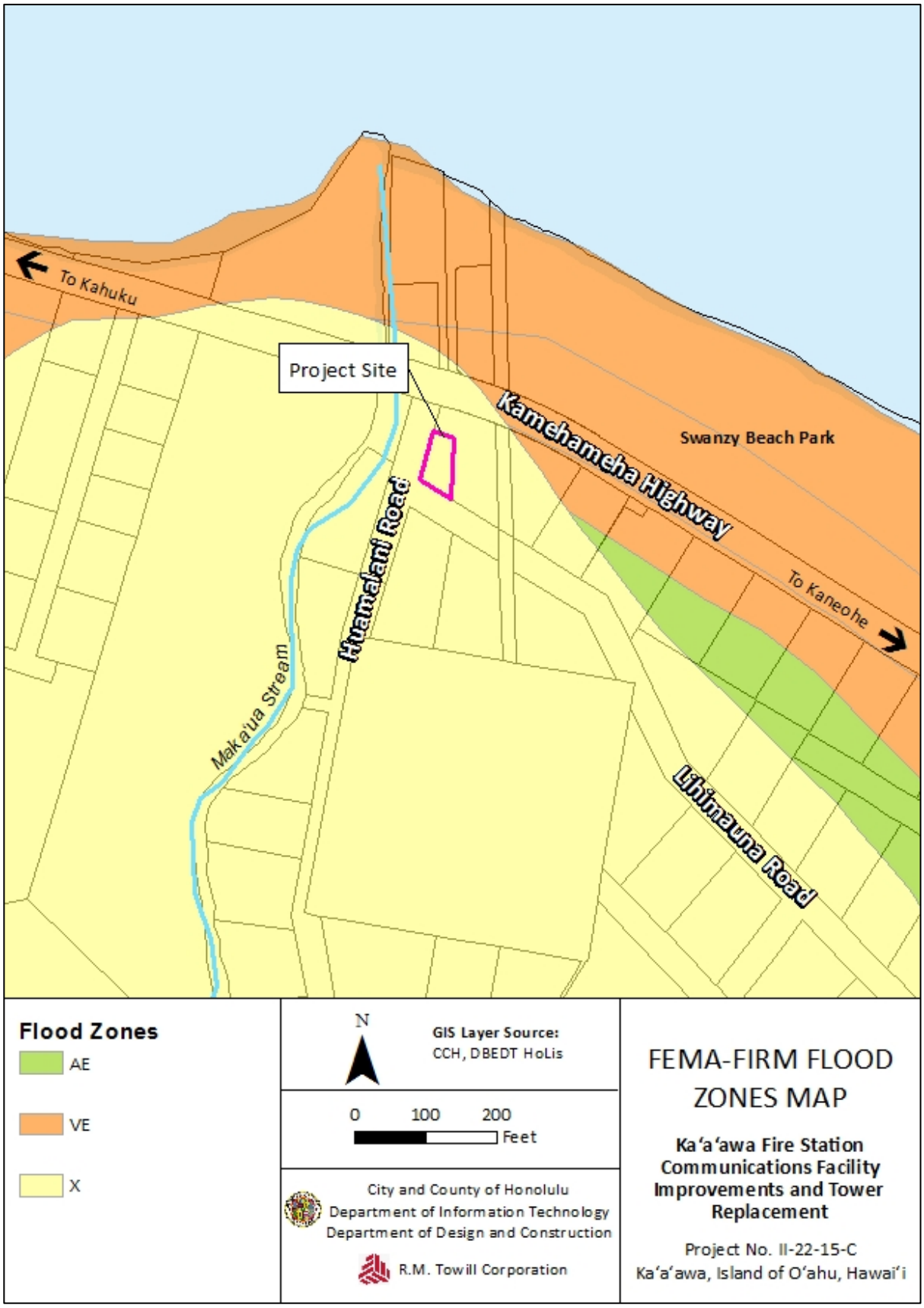
Impacts and Mitigation Measures

To mitigate for potential effects of hurricanes, the proposed new communication tower is designed to comply with the TIA-222-G and the IBC. The TIA-222-G requires that communications towers be designed to survive the most critical loading combination they are exposed to, which is based on load, resistance, and topographic considerations. The proposed communications tower is designed to withstand a load combination of 160 mph, which exceeds the Saffir-Simpson Hurricane Wind Scale for a Category 4 Hurricane which is associated with winds of up to 155 mph.

6.4.3 Flood Hazard

According to the Federal Emergency Management Agency (FEMA) Flood Inventory Rate Map (FIRM) No.15003C0165F (September 30, 2004), the project site is located within Flood Zone "X", which denotes areas outside the Special Flood Hazard Area (SFHA) and 0.2 percent-annual-chance (or 500-year) flood. No base flood elevations (BFE) or base flood depths are shown within Zone "X". See **Figure 6-2, Flood Zones**. ROH, Chapter 21A, Flood Hazard Areas, sets forth development standards for flood zones. Currently, surface runoff from the existing facility is based on prior site grading that was performed to construct the Ka'a'awa Fire Station, the existing tower and equipment and generator building. Due to the site topography, the majority of storm water runoff sheet flows into drainage inlets on Huamalani Road and Kamehameha Highway and is conveyed via subsurface drain pipes into the nearby non-perennial Maka'ua Stream, and empties into the Pacific Ocean during heavy storm events.

Figure 6-2, Flood Zones



Impacts and Mitigation Measures

During construction, there are the potential storm water and non-storm water pollutants to discharge from the project site. The general contractor will implement and install erosion During construction, the contractor will implement erosion control measures and BMPs, including grated inlet protections, compost filter socks, curb and gutter inlet protections and construction ingress and egress, in compliance with the requirements of HAR, Title 11, Chapters 54 and 55.

Once in operation, the new tower, renovated equipment and expanded generator building will not significantly alter the existing drainage patterns, as there will not be a significant increase in impervious area or surface runoff. Additionally, the project site is not anticipated to be susceptible to flooding nor exacerbate flood conditions. No other mitigation measures are recommended.

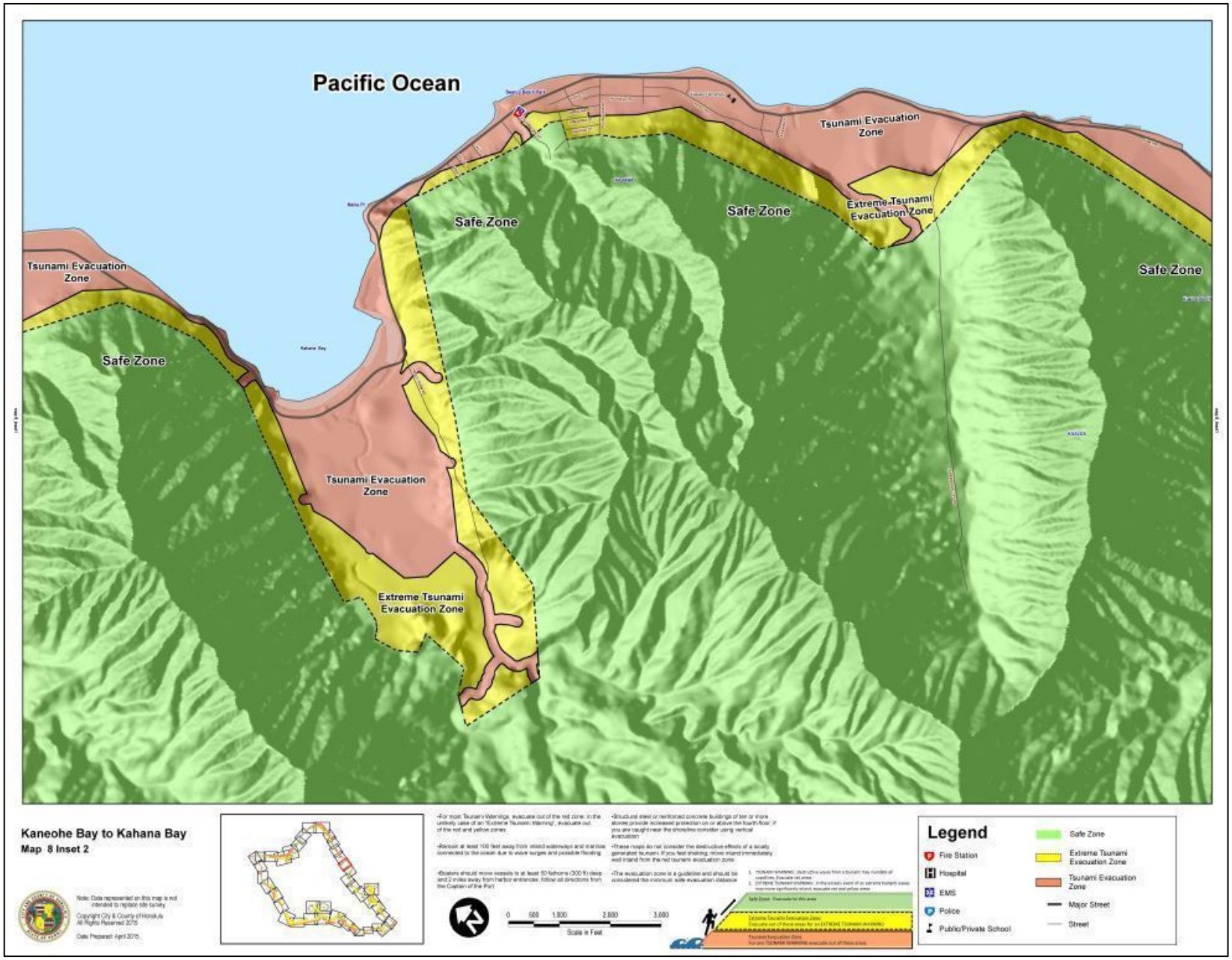
6.4.4 Tsunami

The Project in Ka'a'awa is located within the FEMA Flood Zone X, and the Tsunami Evacuation Zone identified on the City Department of Emergency Management (DEM) Map 8, Inset 2: Kaneohe Bay to Kahana Bay (City DEM, 2015). The CCH tsunami evacuation map designates the project site as an "Extreme Tsunami Evacuation Zone". Directly to the south of the Project is designated as a "Safe Zone". See **Figure 6-3, Tsunami Evacuation Zones**.

Impacts and Mitigation Measures

In the event of a tsunami during construction, activities would cease and equipment would be secured in work support areas. Standard community emergency procedures and evacuation would progress, as required. All structures associated with the Project, and risk of erosion during and following construction, would be addressed through adherence to appropriate Federal, State, and City guidelines and standards. Adverse impacts are not anticipated as the Project is not located within a flood zone or within a wave inundation area, nor will it alter conditions in the project area that could exacerbate flooding

Figure 6-3, Tsunami Evacuation Zone



6.5 FLORA AND FAUNA RESOURCES

No threatened or endangered flora species were observed at the project site during recent site visits. The existing flora observed, consisted primarily of introduced tropical plant species, and other shrub and ground cover commonly found in Hawaiian gardens. Shrub and ground cover species observed include nonnative grass and shrubbery.

No rare, threatened or endangered fauna species were observed at the project site. The existing fauna observed at the project site consist primarily of introduced avifauna species common to urban environments (e.g., doves, sparrows, mynah birds, and cardinals). Although no other fauna species were observed at the project site, it is expected that domestic cats, dogs, chickens, rats or mice may frequent the site.

Impacts and Mitigation Measures

During the construction of the project, some existing plant species may be removed. No long-term adverse impacts to flora or fauna resources are anticipated; therefore, no mitigation measures are recommended or are expected to be required. A landscape plan will be submitted for review and approval prior to construction.

Construction activities may temporarily disrupt routine behavior of common faunal species in the immediate project area, but will not result in permanent displacement, or adversely affect regional distribution of affected fauna. Once project activities are complete, faunal activity in the vicinity of the work site is expected to return to pre-existing conditions.

6.6 SCENIC AND VISUAL RESOURCES

The project site is not identified by the KLSCP as one of the scenic, coastal or shoreline views that require special consideration. However, existing coastal views from surrounding public viewpoints and Kamehameha Highway are characteristic of rural coastal communities in windward O‘ahu and consist of an open skyline, shoreline, and ocean horizon complimented by the peaks, ridges and valleys of the Ko‘olau Mountain Range. Foliage, single residential family homes and part of Swanzy Beach Park are observable from the project site.

The existing 100-ft. tall communications tower has been the largest, fixed structure in Ka'a'awa since its construction in 1998. The tower is apparent in views down Kamehameha Highway in both directions, but does not obstruct coastal views from existing surrounding public viewpoints or from Kamehameha Highway.

The Project involves adding approximately 20 ft. of height to the communications tower, from 100 ft. to 120 ft. tall, and the installation of up to 20 antennas and microwave dishes, similar to features on the existing tower. The new tower will be located approximately in the same location and will be similar in size and appearance to the existing tower. Differences in height, form and scale will be perceptible, but not apparent to the general public compared to the existing tower. Small perceivable differences in the skyline may be observed from Ka'a'awa Park Lane, Huamalani Road, and Lihimauna Road. Thick shrubbery and trees grow within the residential areas of Ka‘a‘awa and surrounding areas mauka of the project site and will help to screen views of the tower from nearby residences.

Impacts and Mitigation Measures

The Project involves the replacement of an existing communications tower at approximately in the same location with a new tower that is 20 ft. taller, but otherwise similar in size and form to the existing tower. Differences in height, form and scale will be perceptible, but not apparent in surrounding view planes compared to the existing tower. See **Figure 6-4 Existing and Proposed Views from Kamehameha Highway (Facing West), Figure 6-5 Existing and Proposed Views from Kamehameha Highway (Facing East) and Figure 6-6 Existing and Proposed Views from Kamehameha Highway at Huamalani Road. (Facing Southeast)**.

6.7 NOISE

Regulation of noise in residential areas of O'ahu is governed by HAR, Chapter 46, Community Noise Control. Allowable day and nighttime noise standards for sensitive receptors have been established for conservation, residential, apartment, hotel, business, agricultural and industrial districts. The project site is within R-5 zoning district, and therefore falls under Class A noise zoning district. The current allowable noise limits for Class A noise zoning districts are 55 dBA during daytime hours (7 a.m. to 10 p.m.) and 45 dBA during nighttime hours (10 p.m. to 7 a.m.) (HAR §11-46-3, Classification of zoning districts). Noise in the Project area is generally low-level, varying slightly spatially and temporally, and is attributable to both human activity and natural sources.

Impacts and Mitigation Measures

During construction there may be short-term noise impacts above normal sound levels due to the operation of heavy equipment, machinery and pneumatic tools. However, construction-related noise will be temporary, intermittent, localized in nature, and will cease once construction is completed. The general contractor will comply with permissible sound levels and will attempt to limit construction activities to normal daylight working hours, and ensure to muffle combustion engines. If nighttime construction work is required, a noise variance will be obtained from the Department of Health (DOH), Indoor and Radiological Health Branch (IRHB).

Once in operation, the new tower, renovated equipment building, and expanded generator building are not anticipated to lead to an increase in the generation of noise, as compared to the existing tower. Unlike the existing unenclosed emergency generator, the new emergency generator will be installed within an enclosed generator room. As such, there may be a perceptible reduction in noise. Furthermore, transmitting antennas do not typically generate noise. No other mitigation measures are recommended.

Figure-6-4, Existing and Proposed Views from Kamehameha Highway (Facing West)

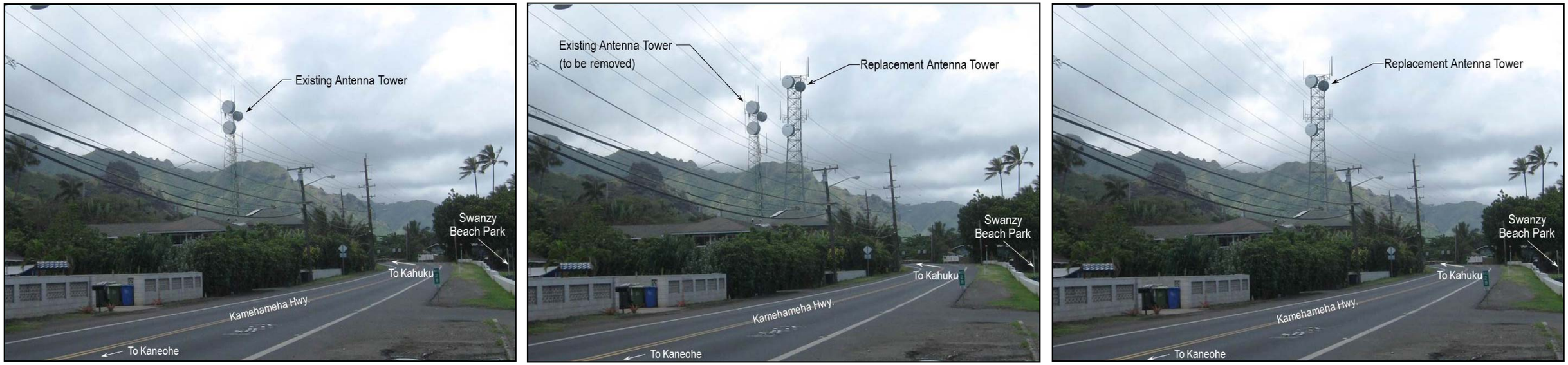


Figure 6-5, Existing and Proposed Views from Kamehameha Highway (Facing East)

Figure 6-6, Existing and Proposed Views from Kamehameha Highway at Huamalani Rd. (Facing Southeast)

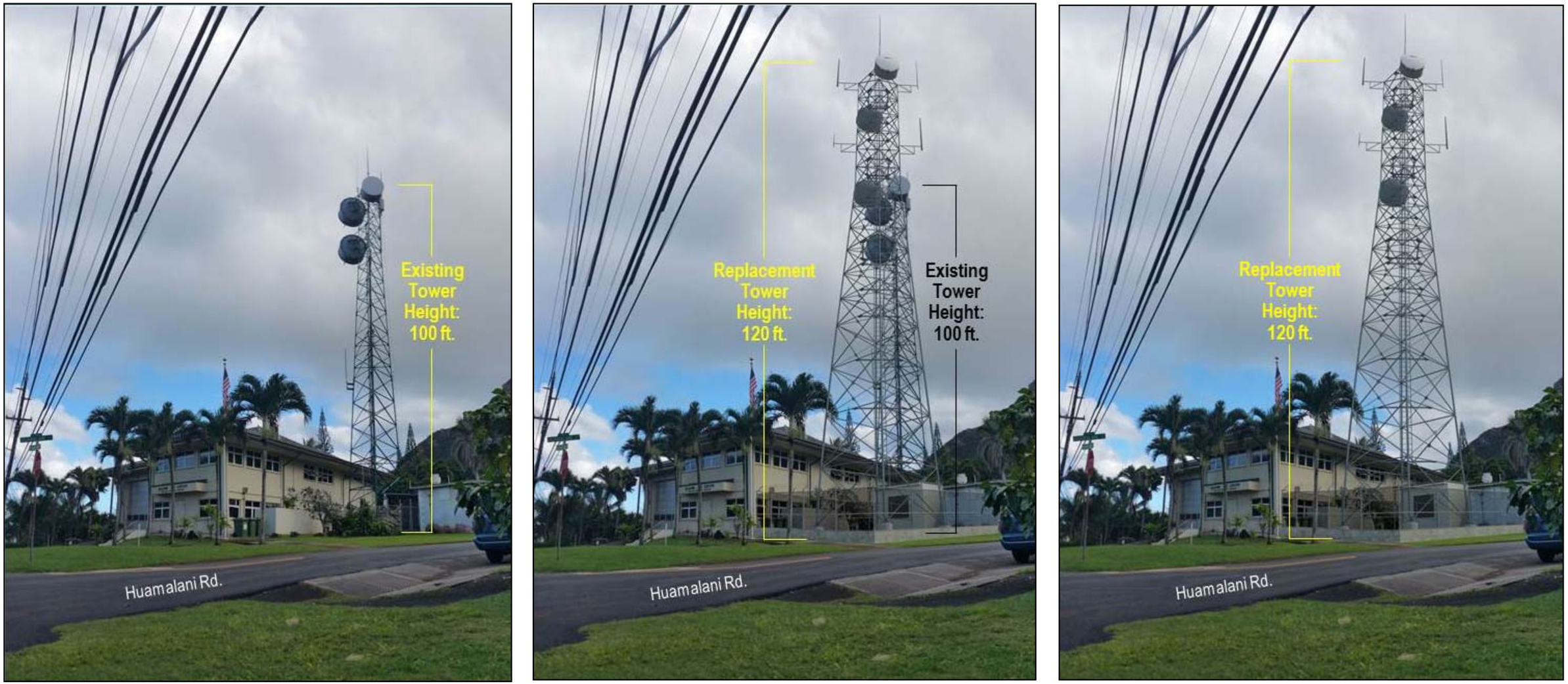
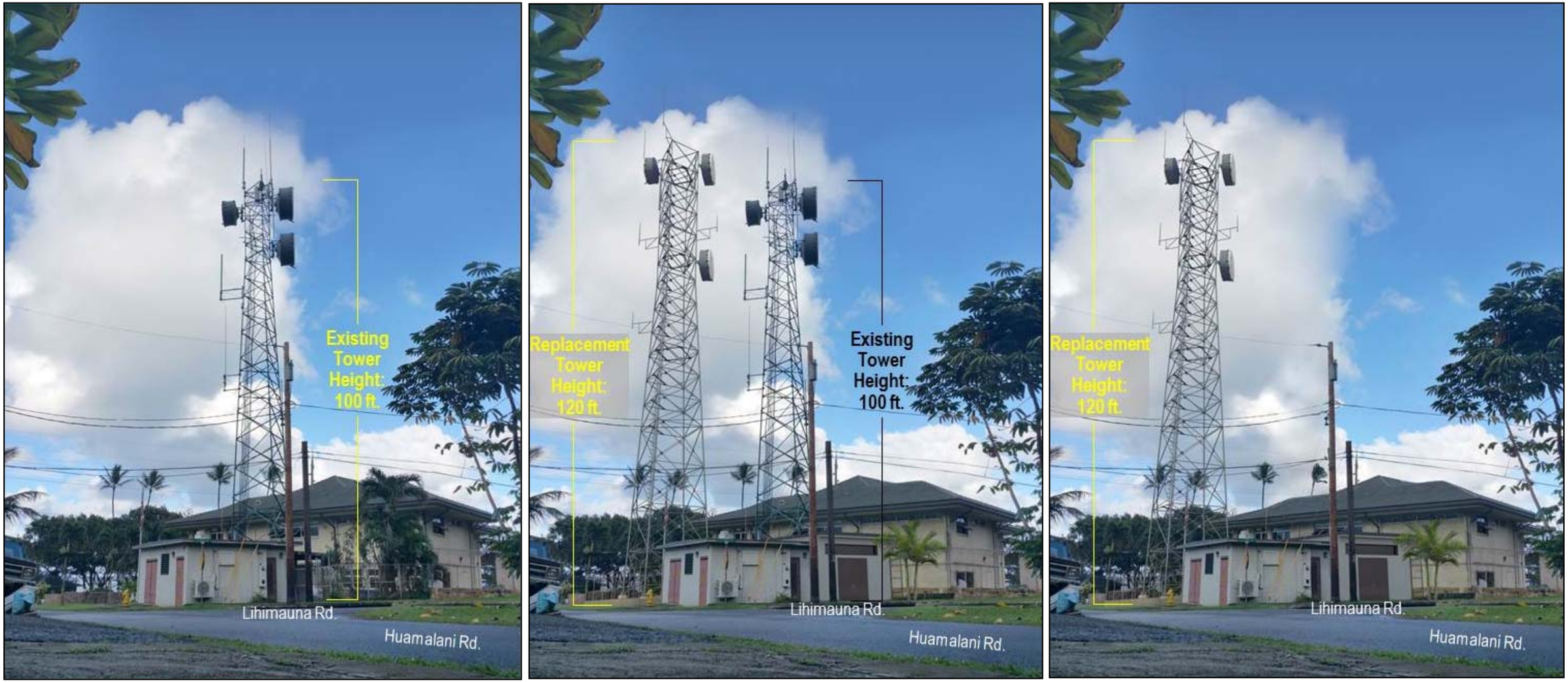


Figure 6-7, Existing and Proposed Views from Huamalani Street



6.8 AIR QUALITY

Air pollutant levels are monitored by the DOH, Clean Air Branch (CAB), under HAR, §11-60.1 statewide. The stations consistently show readings well in compliance with state and federal air quality standards, and the present ambient air quality in the Project area is considered good due to the prevailing northeasterly trade winds and the absence of major industrial activities. Air quality in the Project vicinity can be affected by air pollutants from natural and/or human sources.

Impacts and Mitigation Measures

During construction, there is the potential for short-term air quality impacts from fugitive dust and exhaust emissions from construction vehicles and equipment. However, impacts to air quality will be temporary, intermittent, localized in nature and will cease once construction is completed.

Once in operation, the new tower, renovated equipment building, and expanded generator building are not anticipated to result in significant, long-term adverse impacts to the air quality in the vicinity. No other mitigation measures are required or recommended. No other mitigation measures are recommended.

6.9 LIGHTS

The existing tower is not outfitted with any lights. Similarly, the new tower will not be equipped with any lights.

Impacts and Mitigation Measures

During construction no nighttime construction activities are anticipated. Should nighttime work be required, however, the general contractor will ensure that outdoor lighting is downward-facing and shielded, and that floodlighting is minimized to the extent practicable to prevent light pollution to neighboring properties and minimize impacts to nocturnal seabirds. No other mitigation measures are recommended.

7.0 SOCIAL AND ECONOMIC SETTING

7.1 POPULATION AND GROWTH CHARACTERISTICS

Table 7-1, Estimated Demographics Data for 2015 summarizes the breakdown of data on population, ethnic groups, household information, and income estimated by the U.S. Census Bureau for 2015 comparing the Ka‘a‘awa CDP to Honolulu County.

According to the 2015 American Community Survey, there are an estimated 1,193 residents in the Ka‘a‘awa CDP (U.S. Census Bureau, 2015).

Table 7-1: **Estimated Demographics Data for 2015**

	Ka‘a‘awa CDP	**Honolulu County**
Population	31,139	984,178
Race		
White	46.4%	21.7%
African American	0.6%	2.6%
Asian	5.6%	42.6%
American Indian/Alaskan Native	0.5%	0.2%
Native Hawai‘ian/Pacific Islander	14.6%	9.2%
Some other race	6.4%	0.9%
Two or More Races	32.2%	22.7%
Hispanic/Latino	9.6%	9.2%
Gender		
Male	48.4%	50.6%
Female	51.6%	49.4%
Age		
Under 14	19%	18.4%
15-24	12.8%	13.8%
25-34	16.8%	15.4%
35-44	11.5%	12.6%
45-59	21.5%	18.7%
60 and Over	18.4%	21.1%
Median Household Income	$74,297	$74,460
Persons Below Poverty Level	6.7%	9.7%
Median Home Value	$644,900	$580,200

Impacts and Mitigation Measures

The Project will not lead to an increase in the provision of housing or lead to population growth within the Ka‘a‘awa. The Project will not have an adverse impact on existing neighboring residents; the Project will have an indirect benefit on the surrounding community and island-wide, as the new communications tower will continue to provide a vital link in the emergency communications network which will enable faster emergency response times.

7.2 HISTORIC AND ARCHAEOLOGICAL RESOURCES

A Draft Archaeological Assessment Study (AAS) for the Ka'a'awa Fire Station Facility Improvements and Tower Replacement Project, Ka'a'awa Ahupua'a, Ko'olauloa District, O'ahu TMK: [1] 5-1-011:051 por. was prepared by Cultural Surveys Hawai'I (CSH), in August 2016. See **Appendix B, Draft Archaeological Assessment Study**. In consultation with the State Historic Preservation Division (SHPD), the archaeological inventory scope of work was designed to satisfy the Hawai'i state requirements for archaeological inventory surveys (HAR §13-276 and §13-275/284), and included:

1) Historic and archaeological background research, including a search of historic maps, written records, Land Commission Award documents, and the reports from prior archaeological investigations.

2) A complete (100%) systematic pedestrian inspection of the project area to identify any potential surface historic properties.

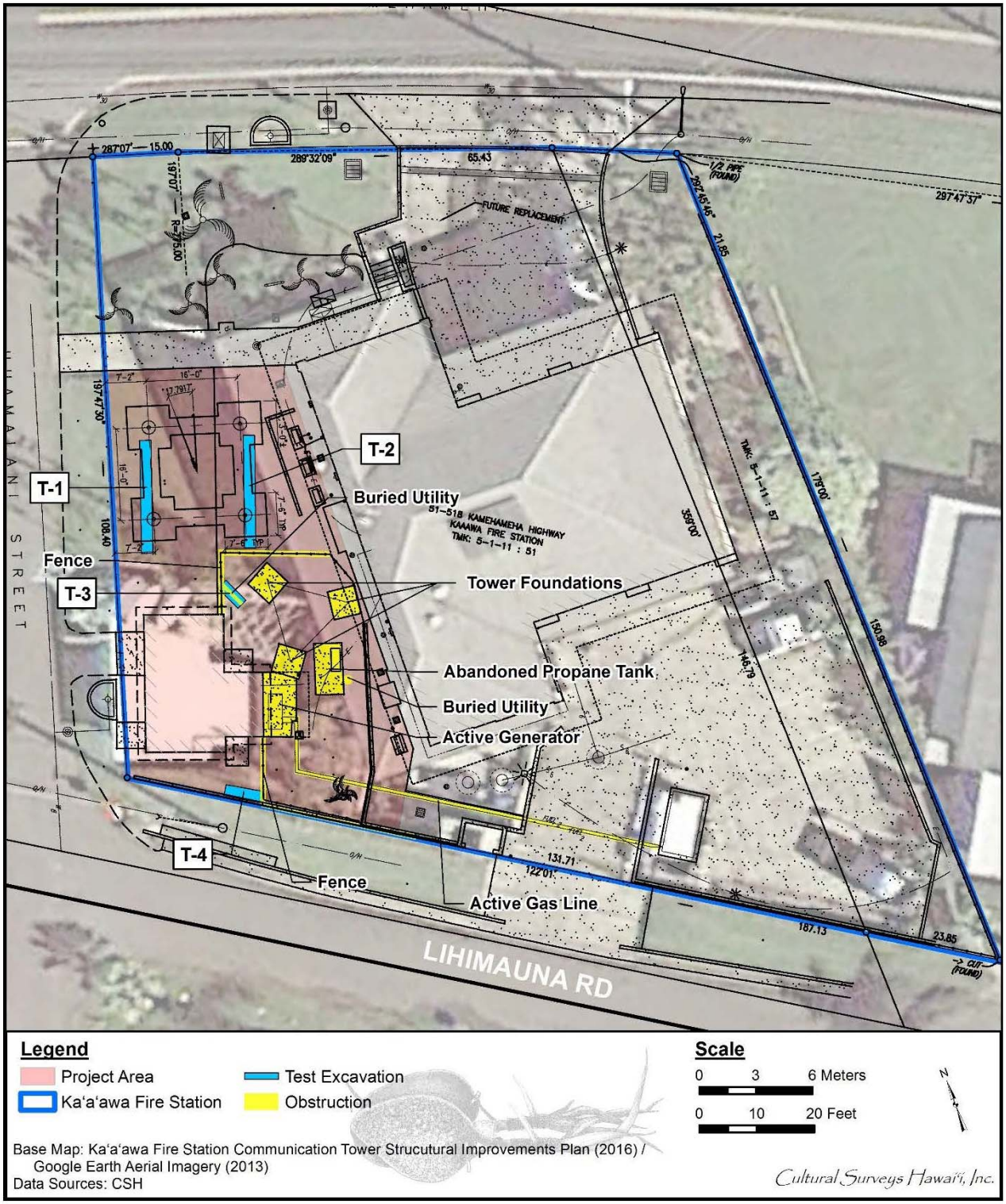
3) A total of four (4) test excavations placed within the Project area - Two (2) trenches in the footprint of the 120 ft. communication tower (Trench T-1 and T-2) and two (2) trenches partly overlapping the fenced area in the southeast portion of the project site (Trench T-3 and T-4). Upon uncovering a utility line in T-3, the excavation was abandoned and the decision was made—based on the apparent subsurface hazards and density of facility infrastructure—not to excavate inside the fenced area. As a result, the remaining T-4 excavation was reduced in size and shifted to the west, outside of the fenced area. This modification of the testing strategy was approved pursuant to consultation with SHPD. A plan view of the adjusted sizes and locations of T-3 and T-4 and the surface obstacles and utility lines encountered inside the fenced area are provided in **Figure 7-1, Adjusted Trench Locations**.

The testing results indicated that the project area was disturbed by construction of the 1950s residential structure and most intensively by the mid-1990s construction of the current Ka'a'awa Fire Station. No historic properties or human skeletal remains were identified as a result of the testing. Three 1-gallon samples were collected from Stratum II, a natural alluvium; two were collected from Trench 1 and one collected from Trench 4. These sediment samples were wet screened for content through a 1/16-inch wire mesh in the CSH laboratory. No cultural material (faunal, floral, and/or artifactual remains) was observed within this sediment sample.

Notably, because no historic properties were identified, the investigation was termed an archaeological assessment (AA), per HAR §13-13-275-5(b)(5)(A), which states, "*Results of the survey shall be reported either through an archaeological assessment, if no sites were found, or an archaeological survey report which meets the minimum standards set forth in chapter 13-276-5*."

Under Hawai'i State historic preservation review legislation, CSH's project-specific effect recommendation is "no historic properties affected." No cultural resources were identified in the project area. As such, based on the results of the testing, no further archaeological work is recommended.

Figure 7-1, Adjusted Trench Locations



The Draft AAS was submitted to SHPD on September 28, 2016. SHPD concurred with the report's project effect determination and recommendation of no further archaeological work for the Project on May 2, 2017. However, SHPD requested revisions before accepting the Draft AAS as satisfying HAR, §13-276-5. The revised report was submitted for SHPD's review, and accepted by letter dated September 11, 2017 from SHPD (see **Appendix C**).

Impacts and Mitigation Measures

As aforementioned, no cultural material, historic properties or human skeletal remains were identified as a result of the archaeological testing. As such, the Draft AAS recommended, and SHPD concurred with, the effect determination of "no historic properties affected" and as a result, no archaeological mitigation is anticipated. No other mitigation measures are recommended. In the event that any potential historic properties or non-human remains are identified during construction activities, all construction will cease and the SHPD will be notified pursuant to Hawai'i Administrative Rules (HAR), Section 13-280-3. In the event that human remains are identified, all construction will stop, the area will be cordoned off, and the SHPD and HPD will be notified pursuant to HAR, Section 13-300-40.

8.0 PUBLIC FACILITIES AND SERVICES

8.1 ACCESS AND TRANSPORTATION

The nearest major arterial road providing access to the Project is Kamehameha Highway (State Route No. 83), a two-lane travel way with a posted speed limit of 25 miles per hour. The Highway begins in Kāne'ohe at the juncture of the Likelike Highway (State Route No. 63), and the H-3 Interstate Highway and extends northbound up until Hāle'iwa, where it transitions into State Route No. 99 and eventually intersects with the State Route No. 803 near Schofield Barracks. Huamalani Road and Lihimauna Road, are two-lane streets which border the north and east portions of the project site. Both of these residential roads consist of two lanes for travel in both directions without striped medians, and have posted speeds of 15 miles per hour.

TheBus operates two routes on Kamehameha Highway fronting the project area. Approximately 40 percent of bus trips made during weekdays are used to commute from home to work. More than approximately 40 percent of weekday trips are used for other home-based trips, and fewer than 20 percent of trips are made by visitors. The closest south-bound bus stop is located on the mauka side of Kamehameha Highway at the intersection with Ka'a'awa Park Lane, approximately 340 ft. away from the project site. The closest north-bound bus-stop is located on the makai side of Kamehameha Highway at Swanzy Beach Park, approximately 0.1 miles south of the project site.

Kamehameha Highway, within the project vicinity, does not contain any signed shared roadway, bicycle lanes, or shared use paths. Bicyclist commuters also utilize Kamehameha Highway within the vehicular travel lanes. Organized bicycle events running through Kamehameha Highway fronting the project site occur relatively often.

The project site is bordered by Kamehameha Highway to the north, Huamalani Road to the west side and Lihimauna Road to the south. The most direct vehicular access to the site is via Huamalani Road from its intersection with Kamehameha Highway. The project site is also accessible from Lihimauna Road, which connects to Kamehameha Highway via two other residential roadways, Polinalina Road and Haiku Road.

Impacts and Mitigation Measures

It is anticipated that the Project may require temporary road closures on Huamalani or Polinalina Roads for construction activities. A portion of Huamalani Road, which does not contain roadway fronting any residential driveway, may need to be blocked off and used for the purposes of equipment storage and staging.

During construction, vehicular traffic to and from the site will be limited to construction vehicles, the majority of which will not be moved off-site for the period of work. Personnel at the KFS will be required to access their employee-only parking lot from Lihimauna Road, utilizing the Kamehameha Highway and Polinalina Road intersection. A traffic plan which accounts for and provides specific mitigation measures for the temporary changes in traffic and circulation will be submitted and approved by the City Department of Transportation Services (DTS) prior to the commencement of construction activities.

The Project is not anticipated to significantly influence TheBus service routes which traverse Ka'a'awa town. TheBus stops will largely remain unaltered, however, the bus route times may be delayed for short periods of time during which construction vehicles and/or equipment are being moved.

Upon the completion of the Project, traffic will resume pre-construction circulation patterns and flow.

8.2 UTILITIES

8.2.1 Electricity

The communication tower and equipment are powered by electricity provided by overhead utility lines that connect to the existing 138kilovolt HECO line located along Kamehameha Highway. Power consumption for the new communication tower will be comparable to the existing tower due to the use of energy-efficient equipment. Two existing HECO meters servicing the existing building will be replaced with a single meter. The Project is not anticipated to have an adverse impact on the power and electricity system. No mitigation measures are recommended.

8.2.2 Telephone

Hawaiian Telcom currently serves the project site and has existing utility service lines in the area. It is expected that these existing lines will continue to be used to service the Project. No off-site work is expected.

8.2.3 Cable/Satellite Television and High-speed Internet Access

Cable/Satellite television and high-speed internet access service is currently provided on the project site.

8.2.4 Gas

The emergency generator is powered by diesel fuel stored in an above-ground tank located at the back of the Fire Station. As part of this project, the existing tank will be replaced with a new, 2,000 gallon above-ground tank. Two existing, two-inch fuel lines that connect the tank to the generator building will be replaced with new lines. The emergency generator is used only in the event of a power outage. The Project is not anticipated to have an adverse impact on the gas system. No mitigation measures are recommended.

8.3 POLICE

The CCH, Honolulu Police Department (HPD) provides civil protective and law enforcement services on O'ahu. The project site is within the HPD Patrol District 4, Sector 4, which serves Ka'a'awa, Kahuku and Kawela Bay. Ka'a'awa is served by the HPD substation in Kahuku located at 56-470 Kamehameha Highway, approximately 12.0 miles from the project site.

Impacts and Mitigation Measures

The Project in itself is not expected to generate any new demand for HPD's services. The new communications tower is anticipated to have a positive long-term impact on services by ensuring the continuity of a reliable communication system in the Project vicinity and on O'ahu. The new tower will continue to provide a vital link in the emergency communications network (between the Kahuku Police Station and the Aikahi Radio Station), which dispatches emergency medical and public safety response and management services by the HPD and other emergency agencies. During construction, however, these services may be required as a result of an injury of construction accident. This potential use for such services is not expected to result in the requirement for new personnel or for construction of a new police facility. No significant impacts are anticipated and no mitigation measures are proposed.

8.4 FIRE

The CCH, Honolulu Fire Department (HFD) provides fire protection services on O'ahu. The project site is adjacent to and within the Ka'a'awa Fire Station No. 21 property. KFS will provide primary response in case of an emergency.

Impacts and Mitigation Measures

During the short-term construction period, work activities will be coordinated as needed to *minimize* potential disruptions to the KFS operations. The Project in itself is not expected to generate any new demand for HFD's services. The new tower is anticipated to have a positive long-term impact on services by ensuring the continuity of a reliable communication system in the Project vicinity and on O'ahu. The new tower will continue to provide a vital link in the emergency communications network (between the Kahuku Police Station and the Aikahi Radio Station), which dispatches emergency medical and public safety response and management services by the HFD and other emergency agencies. No significant impacts are anticipated and no mitigation measures are proposed.

8.5 POTABLE WATER

Potable water is currently provided by the CCH Board of Water Supply. Construction and operation of the Project will not require water use or service connection to BWS water mains. Landscape irrigation for the surrounding site is provided by the existing HFD water system. The Project will not have an adverse impact on the BWS potable water system. No mitigation measures are recommended.

8.6 WASTEWATER

The existing tower and equipment and generator building do not generate liquid waste and do not require a liquid waste disposal system. Similarly, the new tower, renovated equipment building, and expanded generator building will not generate liquid waste. The Project will not have an adverse impact on the municipal wastewater system. No mitigation measures are recommended.

8.7 DRAINAGE AND STORM WATER QUALITY

The project site ground elevation is approximately between 19 ft. and 21 ft. above mean sea level (MSL). The site is generally flat with grades that gently slope northward towards Kamehameha Highway. The area is level, however, limited earthwork will be required to perform essential modifications to site grades and find adjustments to accommodate construction of the new communications tower.

Impacts and Mitigation Measures

Due to the site topography, the majority of storm water runoff sheet flows into drainage inlets on Huamalani Road and Kamehameha Highway and is conveyed via subsurface drain pipes into the nearby non-perennial Maka'ua Stream, and empties into the Pacific Ocean during heavy storm events.

During construction, there are the potential storm water and non-storm water pollutants to discharge from the project site. The general contractor will implement and install erosion control measures and BMPs such as grated inlet protections, compost filter socks, curb and gutter inlet protections and construction ingress and egress, in compliance with the requirements of HAR, Title 11, Chapter 54 and 55.

8.8 SOLID WASTE DISPOSAL

Solid waste generated during the short-term construction activities will be disposed of at an acceptable waste disposal facility such as the PVT Landfill site in Nānākuli, Oahu's primary construction and debris (C&D) landfill. The PVT Landfill accepts approved contaminated soil for disposal or use in solidification of liquid wastes and sludge material for processing or disposal.

Impacts and Mitigation Measures

Construction activities will result in the short-term generation of green waste, soil and solid waste in the form of C&D debris. C&D debris and excavated soils that cannot be reused for fill or cover material will be handled by the general contractor in accordance with State and City regulations governing the safe disposal of such materials at an acceptable facility such as the PVT Integrated Solid Waste Management Facility. Non-construction solid waste generated by Project activities will be collected by the City solid waste disposal service and disposed of at the Waimanalo Gulch Sanitary Landfill (WGSL). Recycling of green and solid wastes will be accommodated to the extent practicable.

Once in operation, the Project will not increase the amount of waste generated, nor will it have a significant, long-term adverse impact on the existing City solid waste collection system. As such, no mitigation additional measures are recommended.

8.9 PUBLIC SCHOOLS

The Project will neither have an adverse impact on nearby schools nor the student population the area. As such, no mitigation measures are recommended.

8.10 RECREATIONAL FACILITIES

The City Department of Parks and Recreation (DPR) owns and maintains the following beach parks in Ka‘a‘awa: Kalae'ō’io Beach Park, Ka‘a‘awa Beach Park, Swanzy Beach Park, and Maka‘ua Beach Park, which range in size from 0.8 acres to 4.8 acres.

Impacts and Mitigation Measures

The Project is not located within or adjacent to any DPR parks and is not anticipated to impact accessibility to parks within Ka‘a‘awa. Access to each of the parks within the Ka‘a‘awa area will remain unchanged during construction and after the project is completed.

8.11 CUMULATIVE IMPACTS

No other improvement projects are planned in the immediate area during the same construction period. As such, cumulative impacts are not anticipated.

9.0 RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

State of Hawai'i and City and County of Honolulu policies, plans, and land use controls are established to guide development in a manner that enhances the environment and quality of life. The establishment of policies, plans, and land use controls at all levels of government are further promulgated to help ensure that the long-term social, economic, environmental, and land use needs of the community and region can be met. The Project's relationship to land use policies, plans, and controls for the region and proposed activity are discussed in the following subsections.

9.1 HAWAI'I STATE PLAN

The Hawai'i Revised Statutes (HRS), Chapter 226, Hawai'i State Planning Act serves as a written guide for the future long range development of the State. The Plan identifies statewide goals, objectives, policies, and priorities. The Hawai'i State Plan, adopted in 1978 and revised in 1986, and promulgated in HRS, Chapter 226 consists of three major parts which describe:

1. Part I- The overall theme including Hawai'i's desired future and quality of life as expressed in goals, objectives, and policies.
2. Part II- A statewide planning system designed to coordinate and guide all major state and county activities and to implement the goals, objectives, policies, and priority guidelines of the Hawai'i State Plan.
3. Part III- The pursuit of desirable courses of action in major areas of statewide concern.

An analysis of the project's ability to meet the objectives, policies and priority guidelines of the State Plan are provided in **Table 9-1**, below:

Table 9-1: Hawai'i State Plan Objectives, Policies, and Priority Guidelines	**Applicability to the Proposed Project**
Objectives and Policies	
§226-5 Objective and policies for population	Not Applicable
§226-6 Objectives and policies for the economy--in general	Not Applicable
§226-7 Objectives and policies for the economy-- agriculture	Not Applicable
§226-8 Objective and policies for the economy--visitor industry	Not Applicable
§226-9 Objective and policies for the economy--federal expenditures.	Not Applicable
§226-10 Objective and policies for the economy--potential growth activities	Not Applicable
§226-10.5 Objectives and policies for the economy--information industry	Not Applicable
§226-11 Objectives and policies for the physical environment--land-based, shoreline, and marine resources.	Not Applicable
§226-12 Objective and policies for the physical environment--scenic, natural beauty, and historic resources.	Not Applicable

Table 9-1: Hawai‘i State Plan Objectives, Policies, and Priority Guidelines	Applicability to the Proposed Project
§226-13 Objectives and policies for the physical environment--land, air, and water quality	Not Applicable
§226-14 Objective and policies for facility systems--in general	**Applicable**
§226-15 Objectives and policies for facility systems--solid and liquid wastes	Not Applicable
§226-16 Objective and policies for facility systems--water	Not Applicable
§226-17 Objectives and policies for facility systems--transportation	Not Applicable
§226-18 Objectives and policies for facility systems—energy/telecommunications	**Applicable**
§226-19 Objectives and policies for socio-cultural advancement--housing	Not Applicable
§226-20 Objectives and policies for socio-cultural advancement--health	Not Applicable
§226-21 Objective and policies for socio-cultural advancement--education	Not Applicable
§226-22 Objective and policies for socio-cultural advancement--social services	Not Applicable
§226-23 Objective and policies for socio-cultural advancement--leisure	Not Applicable
§226-24 Objective and policies for socio-cultural advancement--individual rights and personal well-being	Not Applicable
§226-25 Objective and policies for socio-cultural advancement--culture	Not Applicable
§226-26 Objectives and policies for socio-cultural advancement--public safety	**Applicable**
§226-27 Objectives and policies for socio-cultural advancement--government	**Applicable**
Priority Guidelines	
§226-103 Economic priority guidelines	Not Applicable
§226-104 Population growth and land resources priority guidelines	Not Applicable
§226-105 Crime and criminal justice	Not Applicable
§226-106 Affordable housing	Not Applicable
§226-107 Quality education	Not Applicable

The Project is consistent with the objectives and policies of the Hawai‘i State Plan, as discussed below:

[§226-14] Objective and policies for facility systems-in general.

(a) Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.

(b) To achieve the general facility systems objective, it shall be the policy of this State to:

(1) Accommodate the needs of Hawai‘i's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.

(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.
(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.

Discussion: The proposed project would address the above objectives by providing a more reliable emergency communications services infrastructure. The subject project would ensure dependable and efficient communications system capable of supporting the public's emergency response needs. Therefore, the project is consistent with this objective of the State Plan.

[§226-18] Objectives and policies for facility systems- energy/telecommunications.
(a) Planning for the State's facility systems with regard to energy/telecommunication shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.
(1) Dependable, efficient, and economical statewide energy and telecommunication systems capable of supporting the needs of the people.
(b) To achieve the energy/telecommunication objectives, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable power and telecommunication services to accommodate demand.
(d) To further achieve the telecommunication objective, it shall be the policy of this State to:
(3) Promote efficient management and use of existing telecommunication systems and services.

Discussion: The proposed project would address the above objectives by providing a more reliable emergency communications services infrastructure. The subject project would ensure dependable and efficient communications system capable of supporting the public's emergency response needs. Therefore, the project is consistent with this objective of the State Plan.

[§226-26] Objectives and policies for socio-cultural advancement- public safety.
(h) Planning for the State's socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:
(1) Assurance of public safety and adequate protection of life and property for all people.
(2) Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances.
(d) To further achieve public safety objectives related to emergency management, it shall be the policy of this State to:
(1) Ensure that responsible organizations are in a proper state of readiness to respond to major war related, natural, or technological disasters and civil disturbances at all times.

Discussion: The existing communications tower serves as a critical link between the Kahuku Police Station and the Aikahi Radio Station. The new tower will be critical in maintaining communication service along the windward coast as the tower provides the only local radio communication for emergency services in the towns of Ka'a'awa, Kahana, Punalu'u, Hau'ula, Lā'ie, and parts of Kahuku. If the new tower is not constructed, the existing tower will continue to deteriorate and lose structural integrity, rendering the communication system vulnerable to break down. Therefore, the project is consistent with the objectives of maintaining public safety.

[§226-27] Objectives and policies for socio-cultural advancement- government.

(a) Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives:

(1) Efficient, effective, and responsive government services at all levels in the State.

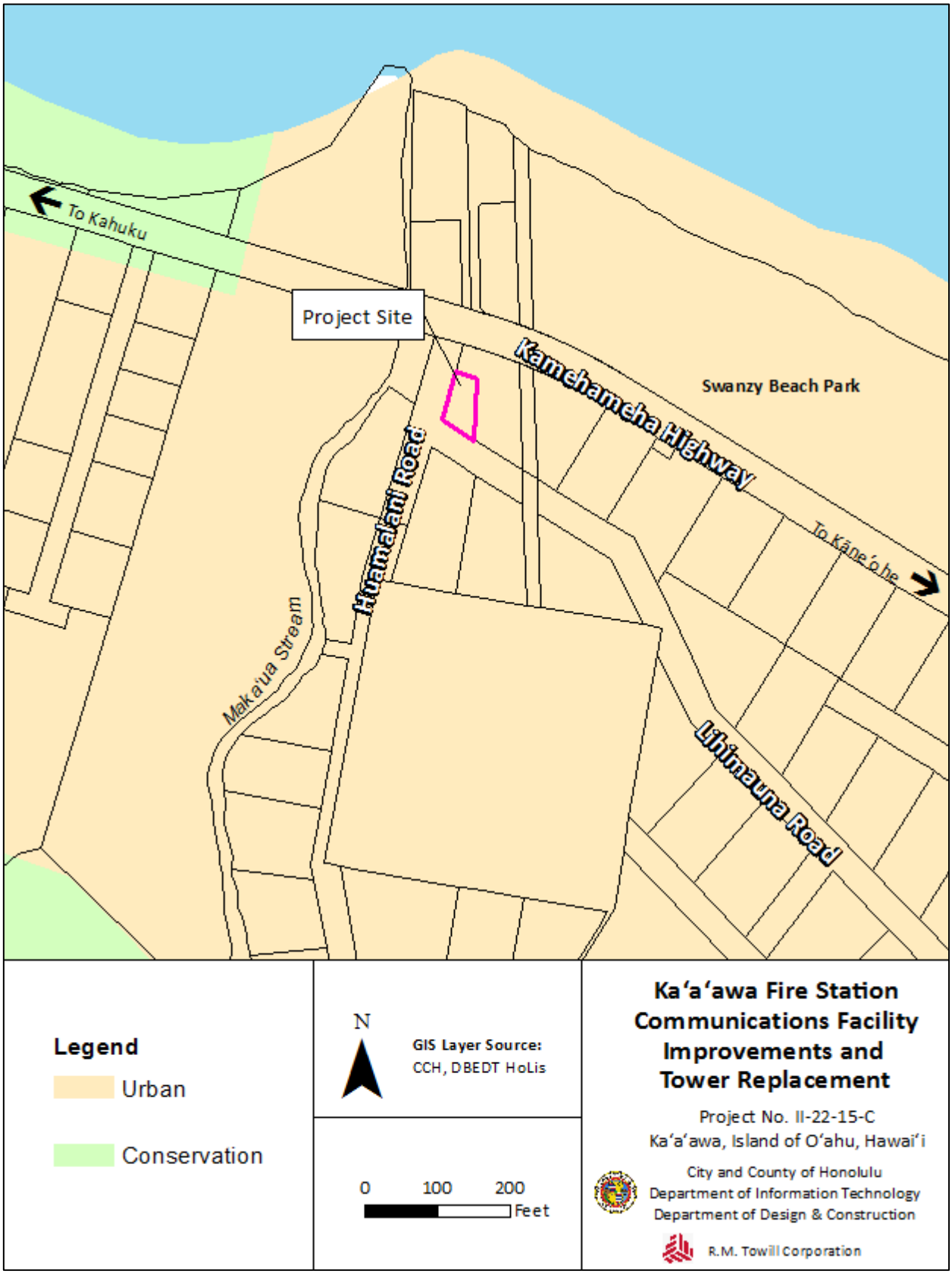
Discussion: The existing communications tower is part of a wider communications system that ensures the efficient deliverance of emergency response during cases of emergency. See **Figure 3-1, Public Safety Communications System: Island of Oahu**. The new communications tower will be critical in maintaining this communication service along the windward coast. If the new tower is not constructed, the existing tower will continue to deteriorate and lose structural integrity, rendering the communication system vulnerable to break down, resulting in inefficient emergency response. Therefore, the project is consistent with maintaining effective government services at all levels.

9.2 STATE LAND USE LAW

The Hawai'i State Legislature determined in 1961 that a statewide zoning system was needed to protect Hawai'i's valuable land from development that provided a short-term gain for a few but resulted in a long-term loss to the income and growth potential of the state's economy. Accordingly, the Legislature established an overall framework of land-use management and adopted the Land Use Law under HRS, Chapter 205, Land Use Commission. The law places all lands in the State in one of four land-use districts: Urban, Agricultural, Conservation, or Rural (the Rural District was added in 1963), and established the Land Use Commission (LUC) under HRS, Chapter 205-1. The Project Site is entirely within the State land use Urban district. See **Figure 9-1, State Land Use** Designations**.** Land uses within the Urban District are regulated through the ROH, Chapter 21, Land Use Ordinance (LUO). Urban Districts generally include lands characterized by "city-like" concentrations of people, structures and services, and can include vacant areas for future development.

The proposed use is consistent with the land use designations as established by the State and detailed in the LUO. No action from the State Land Use Commission is required to implement the proposed project.

Figure 9-1, State Land Use Designations



9.3 HRS CHAPTER 205A COASTAL ZONE MANAGEMENT PROGRAM

The State of Hawai'i designates the Coastal Zone Management Program (CZMP) to manage the intent, purpose and provisions of HRS, Chapter 205(A)-2 as amended, for all lands of the State and the area extending seaward from the shoreline to the limit of the State's jurisdiction, and any other area which a lead agency may designate for the purpose of administering the CZMP. The program is intended to promote protection and maintenance of valuable coastal resources. The program is administered by the State Office of Planning.

The following is an assessment of the Project with respect to the CZMP objectives and policies set forth in Section 205(A)-2.

(1) Recreational resources

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:
A) Improve coordination and funding of coastal recreational planning and management; and
B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;
(ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;
(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;
(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;
(v) Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;
(vi) Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;
(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and
(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.

Discussion: The Project is not expected to have an adverse effect on recreational resources. The project site is located on the mauka side of Kamehameha Highway approximately 350 ft. from the nearest shoreline, and does not involve the use of coastal recreational resources, facilities or access.

(2) Historic Resources

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

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

Discussion: A Draft Archaeological Assessment Study (AAS) was conducted for the project by CSH (**See Appendix B, Draft Archaeological Assessment Study).** No subsurface historic properties or cultural resources were identified on the project site and no further archaeological mitigation is recommended.

As such, the project-specific effect recommendation is "no historic properties affected". SHPD concurred with the report's project effect determination and recommendation, and accepted the AAS by letter dated September 11, 2017 (see **Appendix C**). In the event that any potential historic properties or non-human remains are identified during construction activities, all construction will cease and the SHPD will be contacted immediately pursuant to Hawai'i Administrative Rules (HAR), Section 13-280-3. In the event that human remains are identified, all construction will stop, the area will be cordoned off, and the SHPD and HPD will be notified pursuant to HAR, Section 13-300-40.

(3) Scenic and open space resources

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

Policies:
(A) Identify valued scenic resources in the coastal zone management area;
(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;
(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and
(D) Encourage those developments that are not coastal dependent to locate in inland areas.

Discussion: The Project will not significantly obstruct the mauka-to-makai views from public viewing points and Kamehameha Highway. In addition, the project site is not identified by the KLSCP as one of the scenic, coastal or shoreline views that require special consideration. No continuous, open view shed has existed at the project site since the communications tower was constructed in 1988.

The new communications tower cannot be located farther inland as such areas are undeveloped, mountainous and less suitable for development. Furthermore, the function

of a public communications tower is dependent on line-of-sight, whereby the transmission of radio frequencies cannot occur if the tower is obstructed by intervening mountains or ridges.

The Project involves the replacement of an existing communications tower at approximately in the same location with a new tower that is 20 ft. taller, but otherwise similar in size and form to the existing tower. Differences in height, form and scale will be perceptible, however, surrounding view planes will generally be comparable to the existing tower. **See Figure 6-4 through 6-7 Existing and Proposed Views**.

(4) Coastal Ecosystems

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

Policies:
(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
(B) Improve the technical basis for natural resource management;
(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;
(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and
(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Discussion: The Project will not result in adverse impacts to the coastal ecosystem or its resources. The project site is an existing, developed site, and implementation of the Project will reflect this continued use. Increases in storm water will not result from the project, and no significant changes are proposed to the existing drainage system that is utilized by the project site. During construction, temporary BMPs will be installed, including gravel landscaping, to stabilize soils and prevent erosions and sediment discharge in storm water runoff from the site.

(5) Economic uses

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

Policies:
(A) Concentrate coastal dependent development in appropriate areas;
(B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and
(C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term

growth at such areas, and permit coastal dependent development outside of presently designated areas when:

(i) Use of presently designated locations is not feasible;
(ii) Adverse environmental effects are minimized; and
(iii) The development is important to the State's economy.

Discussion: The communications tower site is strategically located to provide direct line-of-sight communication between the Kahuku Police Station and the Aikahi Radio Station, located approximately 13 miles northwest and approximately 14 miles southeast from the project site, respectively. The tower is critical to maintaining communications service on the windward coast as it provides the only local radio communications for emergency services in the towns of Ka'a'awa, Kahana, Punalu'u, Hau'ula, Lā'ie, and parts of Kahuku.

The new communications tower cannot be relocated upland from the current location of the existing communications tower because the loop microwave radio system technology relies on direct line-of-sight and is unable to operate in a valley or where signals will be obstructed by mountains. For these reasons it is not considered feasible to move the new communications tower farther inland, outside of the SMA.

The new communications tower will remain within the same developed parcel as the existing communications tower, adjacent to HFD KFS No. 21. The materials that comprise the new communications tower are similar in nature and appearance to the existing communications tower. Furthermore, the new communications tower will not extend outside of the existing project site parcel.

(6) Coastal hazards

Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Policies:
(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;
(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and
(D) Prevent coastal flooding from inland projects.

Discussion: The Project is located within FEMA Flood Zone X. Adverse impacts are not anticipated to result from this project because the Project is not located within a flood zone or within a wave inundation area, nor will it alter conditions in the project area that could exacerbate flooding. See **Section 6.5.3, Flood Hazard and Figure 6-2, FEMA Flood Zones**.

The new communications tower is designed to withstand a load combination of 160 mph winds, which exceeds the Saffir-Simpson Hurricane Wind Scale for a Category 4 Hurricane associated with winds of up to 155 mph. The communications tower constitutes critical infrastructure that public and emergency responders depend upon to

transmit and receive information necessary for responding to health emergencies as well as natural hazards events.

(7) Managing development

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

Policies:
(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
(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: All work activities will be conducted in compliance with federal, state, and county environmental rules and regulations. This Chapter 25 DEA will include consultation with key resource agencies and other key stakeholders, including the DLNR-SHPD. Community outreach included consultation with the Ka'a'awa Community Association on December 13, 2016 and March 14, 2017, as well as consultation with the Ko'olau Loa Neighborhood Board (No. 28) on January 12, 2017. See **Appendix E, Record of Consultation**. Members of the public will have additional opportunities to provide input during public hearings that are required for this DEA and the forthcoming SMA (Major) permit application process.

The Project involves improving the existing communications facilities utilized by the emergency medical and public safety responders, and facilities management services' providers within the island-wide communications network and in the local area. It is not anticipated to have adverse short- or long-term impacts on coastal development and/or coastal resource management.

(8) Public participation

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

Policies:
(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 mitigation to respond to coastal issues and conflicts.

Discussion: Consultation was conducted with the Ka'a'awa Community Association on December 13, 2016 and March 14, 2017, as well as consultation with the Ko'olau Loa Neighborhood Board (No. 28) on January 12, 2017. See **Appendix E, Record of Consultation**. In addition, the public will have the opportunity to provide comments

during public hearings required for the SMA permit application process and during the Draft EA publication period. A notice of publication of the Draft EA and Final EA will be published in the OEQC Bulletin. As part of the environmental review process, the public has an opportunity to review and comment on the project during the 30-day public review period. Copies of the Draft EA were distributed to agencies and public organizations listed in Section 16. All comments received during the review period will be addressed in writing and attached to the Final EA.

(9) Beach protection

Objective: Protect beaches for public use and recreation.

Policies:
(A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;
(B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and
(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.

Discussion: The Project is located mauka of Kamehameha Highway, approximately 350 ft. from the nearest shoreline. The project does not involve any work within the shoreline setback area or seaward of the shoreline. BMPs will be implemented during construction activities to control storm water runoff and ensure adherence to HAR, Chapter 54, Water Quality Standards. Temporary BMPs, including the placement of gravel and landscaping with grass or groundcover plants, will be installed during construction to stabilize ground surfaces and prevent sediment discharge in storm water runoff. Therefore, the Project will not impact the recreational or public use of beach resources.

(10) Marine resources

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

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

Discussion: The Project does not involve construction activities within a sensitive marine environment. The project site is located approximately 350 ft. from the nearest shoreline within a previously developed site mauka of Kamehameha Highway. The Project does not interact with ocean waters and will not impact the sustainability of marine and coastal resources. The communications facility may be used by DLNR, Department of Conservation and Resources Enforcement offices in their resource management duties within the region. This will benefit the management of marine and coastal resources and activities.

No listed or protected plant species are known from the area surrounding the project site. Rare, threatened, or endangered fauna are not known to utilize the site for either habitat or for foraging purposes. BMPs will be implemented during construction activities to control storm water runoff and ensure adherence to HAR, Chapter 54, Water Quality Standards. Temporary BMPs, including the placement of gravel and landscaping with grass or groundcover plants, will be installed during construction to stabilize ground surfaces and prevent sediment discharge in storm water runoff. No additional mitigation measures are required or recommended.

9.4 CITY AND COUNTY OF HONOLULU GENERAL PLAN

The CCH General Plan (amended 2002), serves as a written guide for the future long-range development and welfare of O'ahu and identifies island-wide goals, objectives, policies, and priorities (note that the Oahu 2035 General Plan Update is also underway). The General Plan designates the project site as Rural, which denotes areas that are required to maintain uses consistent with low-scale development. The Project conforms to the development guidelines as set forth by the General Plan as it does not involve a change in existing land use and further addresses the Plan's key objectives and policies. The section of the approved General Plan most relevant to the project is related to Section V., Transportation and Utilities, as discussed below.

Section V. Transportation and Utilities

Objective C - *To maintain a high level of service for all utilities.*

Policy 2 - *Maintain existing utility systems in order to avoid major breakdowns.*

Discussion: The structural integrity of the existing communications tower and generator building at the KFS is compromised by rusting and requires replacement. The current communications facility provides communications services to an approximately 25- mile radius and approximately 15,000 residents. It is the only connection between the Kahuku and Aikahi communication sites that comprise the island of Oahu's loop microwave radio system. A disruption or failure in the subject communications facility would severely impact the response time from emergency first-responders. The tower is critical in maintaining communications service along the windward coast as it provides the only local radio communication for emergency services in the towns of Ka'a'awa, Kahana, Punalu'u, Hau'ula, Lā'ie, and parts of Kahuku.

9.5 CITY AND COUNTY OF HONOLULU LAND USE ORDINANCE

Land uses within the CCH jurisdiction are regulated under ROH, Chapter 21, Land Use Ordinance ("LUO"). The purpose of the LUO, as stated in Section 21.1.20, is to:

> *"… regulate land use in a manner that will encourage orderly development in accordance with adopted land use policies, including the O'ahu general plan and development plans, and to promote and protect the public health, safety and welfare."*

Section 21.3.10 of the LUO lists the latest City land use zoning district classifications. The project site is located within the R-5 (Residential) zoning district. ROH Section 21-10.1 defines transmitting antennas as a "Utility installation, Type B". According to ROH, Chapter 21, Article 3, Table 21-3, "*Utility installations, Type B*" are an allowed use in the R-5 zoning district, subject to approval of a Conditional Use (Minor) permit (CUPm) by the CCH Department of Planning and Permitting (DPP), and compliance with ROH Section 21-5.650:

(1) Type B

(1) All requests for Type B utility installations shall be accompanied by a landscape plan which shall be approved by the director. Special emphasis on visual buffering for the installation from adjacent streets and highways.

(2) Type B utility installations for telecommunications shall provide fencing or other barriers to restrict public access within the area exposed to power density of 0.1 milliwatt/cm² for all associated antennas involving radio frequency (RF) or microwave transmissions.

Following the acceptance of the anticipated Final EA/Finding of No Significant, a CUPm will be obtained in conjunction with a SMA Major Permit.

The project is not anticipated to impact neighboring land uses. No mitigation is needed or recommended to address zoning. A detailed discussion of the Project's compliance with the LUO is below.

9.5.1 Permitted Uses

According to ROH, Table 21-3 and §21-2.40-1(b)(1), "*Utility installations, Type B*" is a permitted use in the R-5 zoning district, subject to approval of a CUPm permit by DPP, and subject to §21-5.650. See Figure 9-2, City Zoning Districts. According to ROH, Article 10, Definitions, Utility installations, Type B include the following:

> *"Utility installations, Types A and B, means uses or structures, including all facilities, devices, equipment, or transmission lines, used directly in the distribution of utility services, such as water, gas, electricity, telecommunications other than broadcasting antennas, and refuse collection other than facilities included under waste disposal and processing. A utility installation may be publicly or privately owned and does not include wind machines, which are defined separately… includes accessory uses and structures directly associated with the distribution of the utility service… Type B utility installations are those with potential major impact, by virtue of their appearance, noise, size, traffic generation or other operational characteristics…Also included as Type B uses are transmitting antennas in country, residential, A-1, or AMX-1 districts, and freestanding antenna structures."*

The proposed new tower, renovated equipment building, and expanded generator building will be a continuation of the existing, established use and will operate as an unmanned, communication utility infrastructure which conforms to the underlying R-5 zoning district. The

Project will conform to the general and specific development standards as listed in LUO Article 4. Notably, a certification of Categorical Exclusion for Antenna Installations was approved on June 29, 2017 pursuant to §21-10.1, and is included herein as **Appendix D**.

9.5.2 Development Standards

The Project will generally comply with the **R-5** zoning district development standards, as listed below in **Table 9-2:** R-5 **Zoning** District Development Standards **R-5 Zoning District Development Standards**.

Table 9-2: **R-5 Zoning District Development Standards**

Development Standard	LUO Provision	Project
Minimum Lot Area	5,000 sf.	12,514 sf.
Minimum Lot Width and Depth	50 sf.	≈106 sf.
Front Yard	30 ft.	≈ 43 ft. 10 in.
Side/Rear Yards	15 ft.	≈ 3 ft. 6 in. to 7 ft. 2 in.
Maximum Building Area	50 %	Actual: 5,648 sf. Includes: Existing Fire Station: 4,860 sf Renovated Equipment Building: 412 sf Expanded Generator Building: 376 sf
Maximum Building Height	25-30 ft.	120 ft.
Height Setbacks[1]	Per Sec. 21-3.70-1(c)	New Antenna Tower: 120 ft. Renovated Equipment Building: 8 ft. 8 ½ in. Expanded Generator Building: 11 ft. 5 in. (Height waiver will be required for the new antenna tower and generator building)

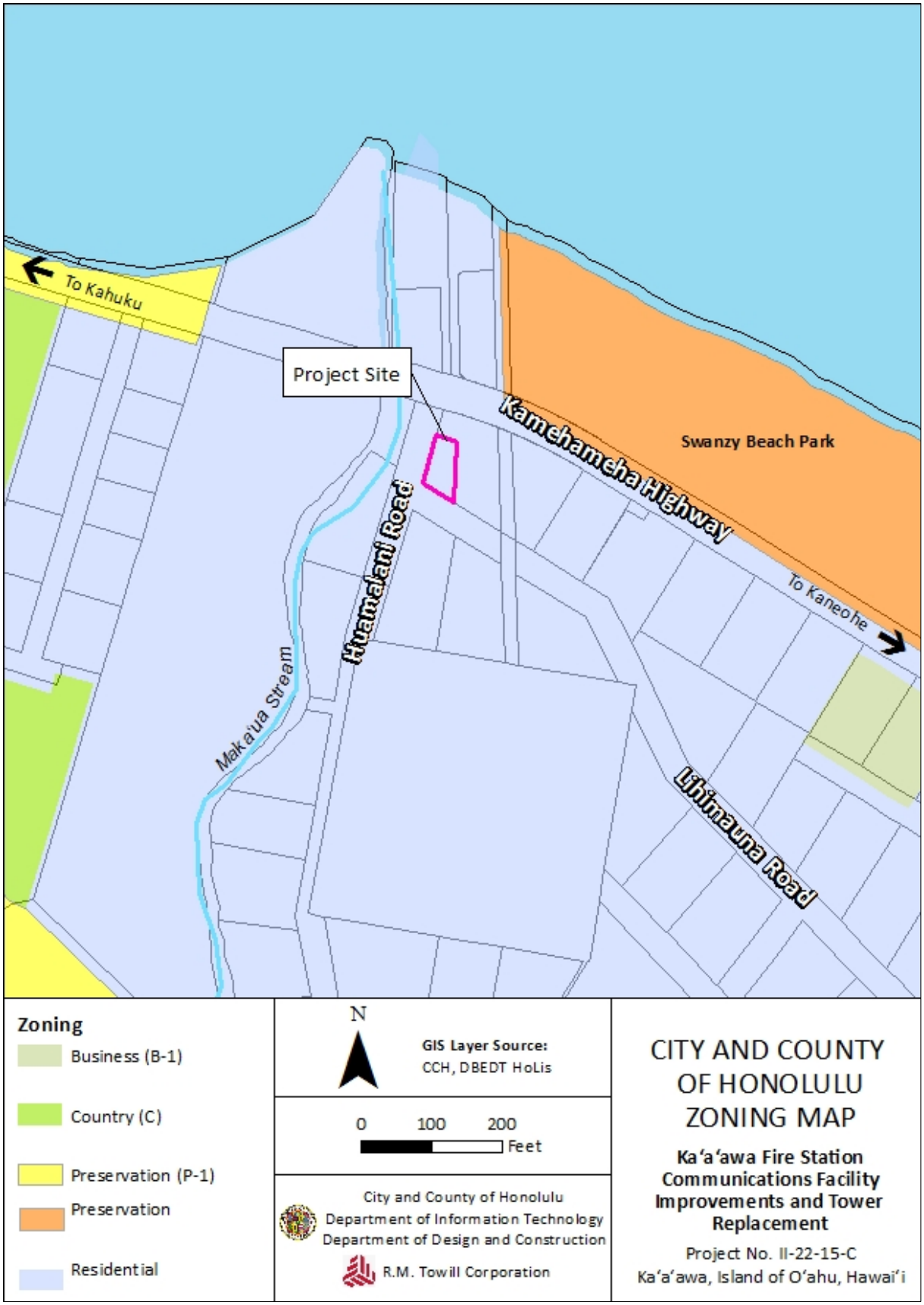
9.5.3 Parking and Loading

There is currently no parking exclusively for the communications tower and associated structures on the project site. Communications tower maintenance staff utilizes street parking or the yard of the Ka'a'awa Fire Station adjacent to the tower.

The Project does not include the provision of off-street parking or loading stalls. The DDC acknowledges that the DPP Director has the discretionary authority to determine whether or not off-street parking should be required for "Utility Installations, Type B", in accordance with ROH Chapter 21, Article 6, Table 21-6.1, *Off-street Parking and Loading*.

[1] Heights above the minima of the given range may require height setbacks or may be subject to other requirements. See the appropriate section for the zoning district for additional development standards concerning height.

Figure 9-2, City Zoning Districts



9.6 SPECIAL MANAGEMENT AREA (SMA) RULES AND REGULATIONS

The City has designated the shoreline and certain inland areas of O'ahu as being within the Special Management Area (SMA). SMA areas are designated sensitive environments that should be protected in accordance with the State's Coastal Zone Management policies, as set forth in ROH, Section 25, Shoreline Management, and HRS, Section 205A, Coastal Zone Management (see Section 10 regarding the Project's conformance with SMA review guidelines). The project site is located entirely within the SMA and has an estimated construction cost of $3.2 million. As such, a SMA Major Permit will be required prior to construction.

9.7 KO'OLAU LOA SUSTAINABLE COMMUNITIES PLAN

The Ko'olau Loa Sustainable Communities Plan (KLSCP), adopted in 1990, sets forth the community's desired land use goals, objectives and policies for the Ko'olau Loa region for a 25-year planning period. An update to the KLSCP is currently being prepared by the City. The project site is located within the Community Growth Boundary in an area designated as "Rural Community" on the KLSCP Public Facilities Plan. See **Figure 9-3, Draft KLSCP Public Facilities Plan**. The following is an assessment of the Project with respect to the objectives and policies set forth in KLSCP.

"4.4 Electrical Power Development"

4.4.1 General Policies

The following general policy pertains to electrical power development in Ko'olau Loa.

> *Locate and design system elements such as renewable electrical power facilities, substations, communication sites, and transmission lines, including consideration of underground transmission lines, to mitigate any potential adverse impacts on scenic and natural resources, as well as public safety considerations.*

4.4.2 Planning Principles and Guidelines

> *Facility Routing and Siting Analysis. If any new or relocated electrical power facilities, substations, communication sites, or transmission lines or communication towers are necessary, the selection of the route or site of such facilities should be supported by an analysis demonstrating how potential adverse impacts on scenic and natural resources have been mitigated. Although these facilities are not shown on the Public Facilities Map, their routes and sites are reviewed and permitted by administrative agencies of the City when they are within the Special Management Areas.*

Discussion: The Project involves the replacement of an existing communications tower at approximately in the same location with a new tower that is 20 ft. taller, but otherwise similar in size and form to the existing tower. Differences in height, form and scale will be perceptible, but not apparent in surrounding view planes compared to the existing tower.

The new communications tower cannot be located farther inland as such areas are undeveloped, mountainous and less suitable for development. Furthermore, the function of a public communications tower is dependent on line-of-sight, whereby the transmission of radio frequencies cannot occur if the tower is obstructed by intervening mountains or ridges.

The DEA for the Project serves as a comprehensive analysis of the potential impacts of the project on its surrounding environment. Because the project site is located within the SMA, a SMA Major permit will be required from the DPP.

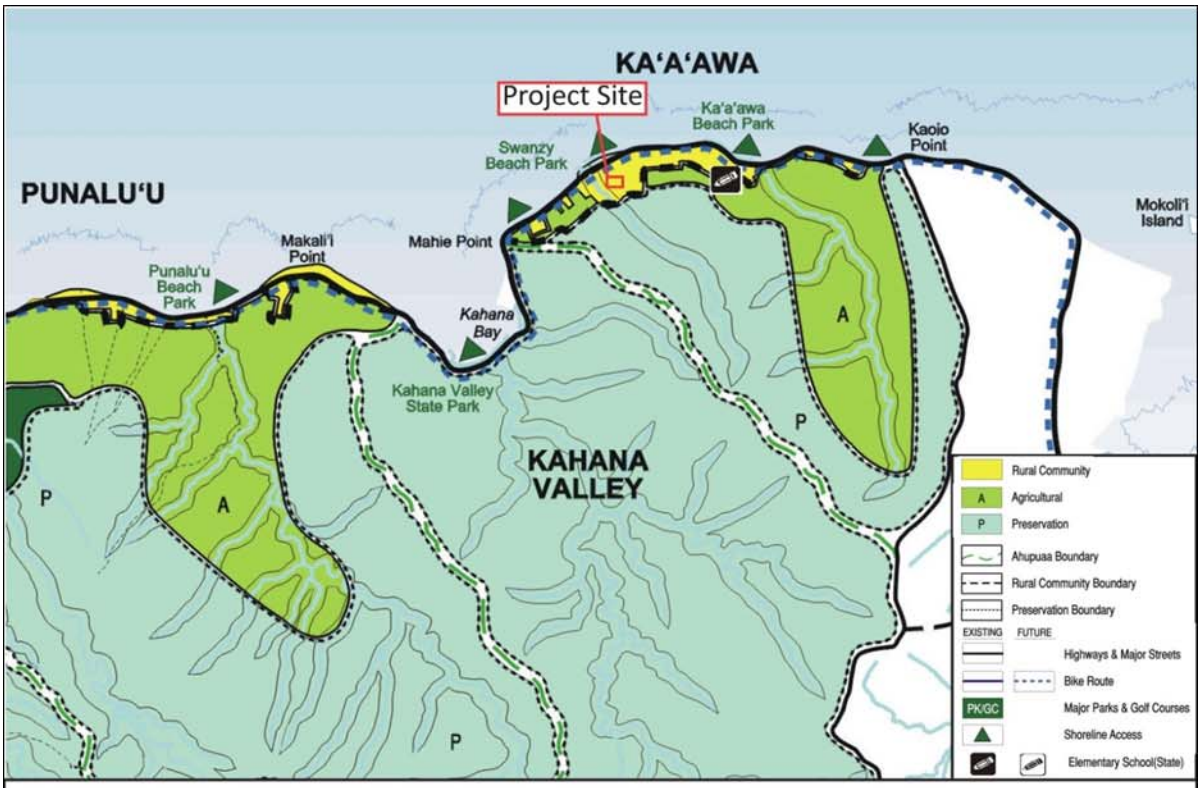
"4.8 Civic and Public Safety Facilities"

4.8.1 General Policies

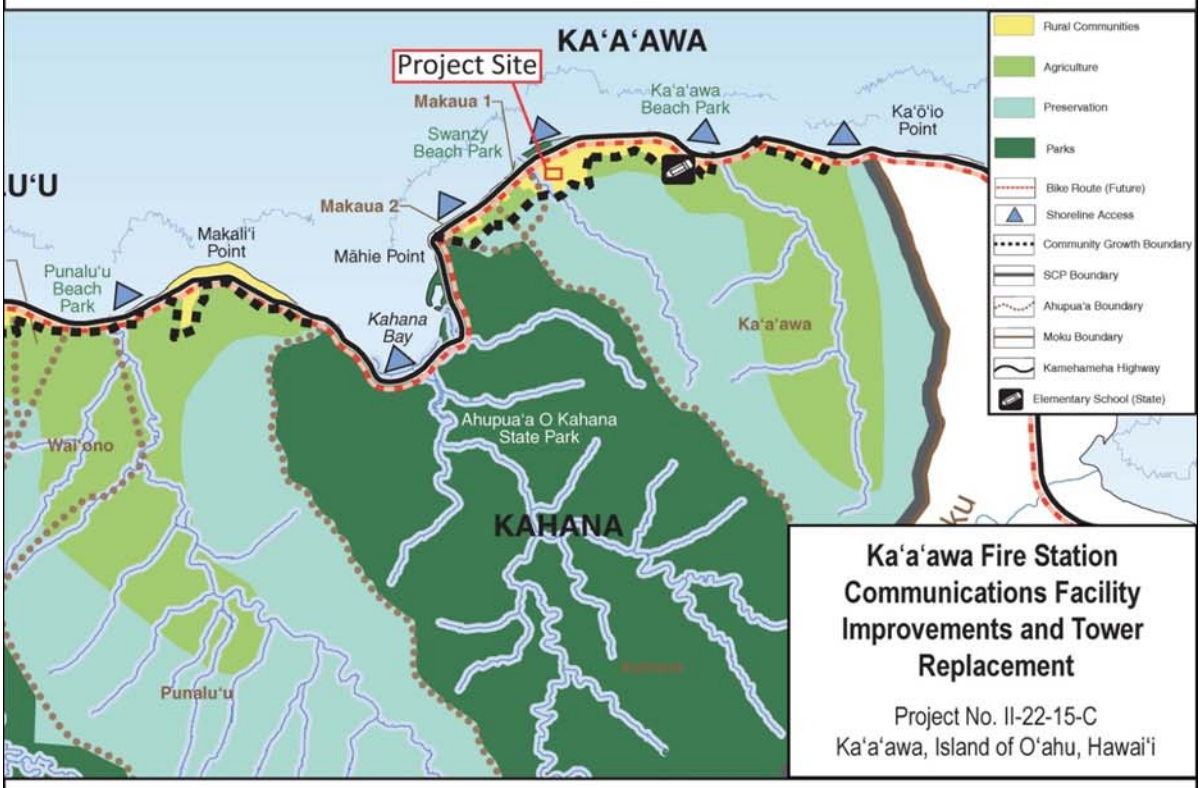
Support adequate staffing and facilities to ensure effective and efficient delivery of basic governmental service, emergency and primary medical services, and protection of public safety.

Discussion: The project fulfills the KLSCP policy of supporting the effective and efficient delivery of emergency services. The deterioration of the existing communications tower exposes the communications network to potential breakdown. Any breakdowns in the system would result in delays in response times from emergency first-responders. It is the only connection between the Kahuku and Aikahi communication sites that comprise the island of Oahu's loop microwave radio system. The tower is critical in maintaining communications service along the windward coast as it provides the only local radio communication for emergency services in the towns of Ka'a'awa, Kahana, Punalu'u, Hau'ula, Lā'ie, and parts of Kahuku.

Figure 9-3, Ko'olau Loa Sustainable Communities Plan (1999 and Pre-Final)



1999 Plan



Pre-Final 2012 Plan (Pending Approval)

10.0 CONFORMANCE WITH SMA REVIEW GUIDELINES

The project site is located entirely within the CCH SMA. As such, an SMA Major Permit will be required. The CCH SMA Review Guidelines are contained in ROH, Chapter 25, Article 3, Section 3.2, Review Guidelines, as amended, and are the counterparts to the State's Coastal Zone Management Guidelines set forth in HRS, Chapter 205A. The following discussion describes the Project's compliance with the CCH SMA Review Guidelines.

10.1 ROH SECTION 25-3.2(a)

All development in the special management area shall be subject to reasonable terms and conditions set by the council to ensure that:

(1) 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.

Discussion: The project site is located within the existing developed communication tower site. Access to beaches, recreation areas, and natural reserves will not be affected by project activities or operation of the new communication tower following construction.

(2) Adequate and properly located public recreation areas and wildlife preserves are reserved

Discussion: The project consists of improvements within a developed and established communication tower site. Public recreation areas and wildlife preserves will not be affected by project activities or operation of the new communication tower following construction.

3) Provisions are made for solid and liquid waste treatment, disposition and management which will minimize adverse effects upon special management area resources.

Discussion: Construction activities will not generate a significant quantity of liquid waste. Construction personnel will have access to existing restroom facilities at the fire station or be provided with Porta Johns. No other mitigation measures are required or recommended.

Construction activities will result in the generation of construction and demolition debris. Construction and demolition debris will be disposed of at the PVT Landfill in accordance with CCH and State DOH regulations and provisions of the PVT facility license. Non-construction solid waste generated by project activities may be collected and disposed at the Waimānalo Gulch Landfill or H-Power. Project activities are not expected to generate excess excavated material.

(4) Alterations to existing land forms and vegetation, except crops, and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation or failure in the event of earthquake.

Discussion: The project site is currently developed with the existing communication tower and related facilities. No natural land forms or native vegetation are present. Construction of the Project will not significantly increase impervious surfaces or the quantity of storm water runoff. For these reasons, surface water resources are not anticipated to be impacted by the Project.

Replacement of the existing communication tower with a new tower of comparable size, form and appearance in the same approximate location will not result in a significant change over existing conditions or adversely affect the condition of scenic and recreational amenities. Further, the Project is not anticipated to be adversely impacted by flooding, landslides, erosion, siltation or earthquake nor will the Project exacerbate the site's exposure to coastal hazards.

10.2 ROH SECTION 25-3.2(b)

No development shall be approved unless the council has first found that:

(1) The development will not have any substantial adverse environmental or ecological effect except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health and safety, or compelling public interest.

Discussion: The Project is not anticipated to involve a substantial degradation of environmental quality. The planned replacement of the existing communication tower and facilities with a new tower facility of comparable size, form, appearance and function will not substantially alter environmental conditions at the site. Planning and design for the project includes mitigation measures to prevent or minimize potential adverse environmental effects. The project will not result in cumulate impacts, will not involve a commitment to larger actions, and will not result in the elimination of planning options.

The *minor* environmental effects from construction activities and operation of the communication tower should be considered in light of the project's benefit to public and emergency service communications which will aid in the management and protection of life, property and natural resources.

(2) *The development is consistent with the objectives and policies set forth in Section 25-3.1 and area guidelines contained in HRS Section 205A-26.*

Discussion: The project is in compliance with the objectives and policies set forth in HRS 205A-2, and SMA guidelines contained in HRS 205-A26. This document is prepared to describe the project effects in relation to the SMA guidelines in HRS Section 205A-26 and ROH Section 25. See Section 9.3 HRS Chapter 205A Coastal Zone Management Program for discussion of the project's compliance with the State's objectives and policies for the Coastal Zone.

(3) The development is consistent with the county general plan, development plans and zoning. The Project is consistent with the CCH General Plan, the Ko'olau Loa Sustainable Communities Plan, and City Zoning.

Discussion: Project's compliance with the objectives and policies of the City and County of Honolulu General Plan are provided in **Section 9.4** of this DEA. The Project's

implementation of the objectives and policies set forth in the Ko'olau Loa Sustainable Communities Plan are discussed in **Section 9.7** of this DEA. The Project is within R-5, Residential zoning use precinct. The Project's compliance with the R-5 zoning use is provided in **Section 9.5** of this DEA.

11.0 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF HUMANITY'S ENVIRONMENT AND THE MAINTENANCE OF LONG-TERM PRODUCTIVITY

11.1 Short-Term Uses

The project would involve short-term uses of the environment during the construction phase. These uses would have both positive and negative impacts. Construction activities associated with the Project would require use of resources, including manpower, equipment, water, energy, fuel, etc.; however, impacts from the increased use of these resources are anticipated to be minimal and temporary.

In the short-term, the project would also result in positive benefits to economic uses in the local area. The economic impacts of project construction would include the impact of expenditures on construction materials, and on earnings of construction workers and professional service providers during construction.

11.2 Long-Term Productivity

The Project would have beneficial impacts on long-term productivity of the CCH emergency response system due to the replacement of the existing communications tower, which is currently in a structurally deficient state. The construction of a new communications tower will ensure the long-term and continued effectiveness and efficiency of the CCH emergency response system, and enable the Ka'a'awa Fire Station communications tower to continue its critical role as the link between the Kahuku Police Station and the Aikahi Station. The renovation of the existing equipment and expansion of the generator building will allow for the proper accommodation for equipment, main generator, and the emergency generator.

The development of the communications tower, renovation of the equipment building, and expansion of the generator building have long been established uses on the project site, and have contributed to the long-term productivity of the property and efficiency of the CCH emergency response system. Since its construction in 1988, the existing communications tower has served as a critical link between the Kahuku Police Station and the Aikahi Station. The Project would allow for the site's continued productivity.

If the Project is not constructed, tower repairs will be required on a recurring basis or the existing tower will continue to deteriorate and lose structural integrity, rendering the communication system vulnerable to disruptions or failure. In addition, the renovated equipment and expanded generator building will ensure that, should a breakdown occur, there is sufficient back-up for the communications system. Therefore, long-term productivity would be increased by implementation of the Project.

12.0 PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

Adverse impacts can be defined as short- and long-term effects relative to the construction and implementation of a specific use. Short-term impacts are usually construction-related impacts that would occur during the course of construction and cease upon completion of the project. Long-term impacts generally result from the implementation of the Project.

12.1 Short-term Effects

The Project may temporarily result in impacts related to construction activities, which may include the generation of dust, noise, and traffic during the daytime hours of the work week daytime hours.

12.2 Long-term Effects

Long-term impacts associated with the project primarily consist of the observable increase in the height of the new communications tower from 100 to 120 ft. Renovations to the existing equipment and expansion of the generator building will also be noticeable. The project will not result in significant changes to the visual character of the surrounding area and will not block mauka-to-makai coastal views from Kamehameha Highway and other public viewing places.

13.0 COMMUNITY INPUT

Presentations of the Project were made at regularly scheduled meetings of the Ka‘a‘awa Community Association (KCA) and Ko‘olauloa Neighborhood Board No. 28 (KNB) as summarized below. Notes for the respective meetings are provided in **Appendix E, Record of Consultation**.

13.1 KO‘OLAULOA NEIGHBORHOOD BOARD

A presentation was made to the Ko‘olauloa Neighborhood Board (NB) No. 28 on January 12, 2017. Several questions were asked by the board members and addressed by the project team, however, none were in opposition to the project. Concern was expressed about the possibility of an accidental vehicular impact to the tower, and whether the structural design could sustain such impact. In response to the concern, following the meeting, the design plans were modified to incorporate a 27-inch concrete wall with the security chain link fence around the perimeter of the new tower to provide added protection against an inadvertent vehicular accident. The KNB voted unanimously in support of the project. In addition, the Honolulu Police Department expressed strong support for the project. On April 29, 2017, RMTC emailed to Ms. Verla Moore, Chair of the Ko‘olauloa NB No. 28 to inquire whether it was necessary to present the project a third time for the Conditional Use Permit (CUPm) permit application process. On May 6, 2017, Ms. Moore responded via email, confirming that an additional presentation was not needed.

13.2 KA‘A‘AWA COMMUNITY ASSOCIATION

On December 13, 2016, the Applicant’s consultant, R. M. Towill Corporation (RMTC) conducted a presentation at the Ka‘a‘awa Community Association (KCA) meeting. No significant comments were received, and the KCA passed a unanimous motion in support of the Project. A second presentation was provided as a follow-up to the KNB meeting. Design modifications were presented, including the 27-inch concrete wall integrated with the security chain link fence surrounding the new tower. Additional photographic simulations of the existing and proposed towers were also presented. The KCA had no significant comments and reaffirmed their support for the project. On May 6, 2017, Mr. Robert Domingo, the KCA Chairman, confirmed via email that an additional presentation was not needed to solicit input on the Conditional Use Minor Permit.

14.0 PARTIES TO BE CONSULTED

The following agencies, organizations and public utilities will be provided hard copies or CDs of this Draft. EA, and timely comments will be included and responded to in the Final EA:

State of Hawai‘i

- Department of Accounting & General Services
- Department of Business, Economic Development & Tourism
- Energy, Resources & Technology Division
- Office of Planning
- Department of Health - Environmental Planning Office
- Department of Land & Natural Resources, State Historic Preservation Division
- Department of Transportation
- University of Hawaii Environmental Center

City and County of Honolulu

- Board of Water Supply
- Department of Design & Construction
- Department of Environmental Services
- Department of Facility Maintenance
- Department of Parks and Recreation
- Department of Planning and Permitting
- Department of Transportation Services
- Honolulu Fire Department
- Honolulu Police Department
- Ko‘olauloa Neighborhood Board

Elected Officials

- Senator Gil Riviere (Senate District 23)
- Representative Sean Quinlan (House District 47)
- Council Member Ernest Martin (Council District 2)

Utility Companies

- Hawaiian Telcom
- Hawaiian Electric Company
- Spectrum

Community Organizations

- Ka‘a‘awa Community Association

Libraries

- Hawai‘i State Library
- Kahuku Public and School Library
- Municipal Reference & Records Center

15.0 ANTICIPATED DETERMINATION

HAR, Title 11, Chapter 200 (EIS Rules), of the State DOH establishes criteria for determining whether an action may have a significant impact on the environment. The Rules establish "significance criteria" for making the determination. The relationship of the Project to the thirteen criteria is provided below. Based on the evaluation and the information contained in DEA, it is anticipated that an Environmental Impact Statement (EIS) will not be required and that a recommended Finding of No Significant Impact (FONSI) will be published for the Project.

1. Involves an irrevocable commitment to loss or destruction of natural or cultural resources;

   The Project is not expected to adversely impact natural or cultural resources. The project site will involve substantively the same land uses when the project is completed as there is no further space available within the existing site.

2. Curtails the range of beneficial uses of the environment;

   The Project will not result in the curtailment of the range of beneficial uses of the environment. The Project will involve a continuation of the existing use of the site. The proposed action is intended to update the CCH emergency response communication system. The improvements will support public safety-related issues and is undertaken for the public good.

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

   The Project is consistent with the environmental policies, goals and guidelines expressed in HRS, Chapter 343 and 344. A Declaration of Exemption was approved on October 12, 2017 by DIT and DDC, and is included herein as **Appendix F**.

4. Substantially affects the economic or social welfare of the community or state;

   The Project will benefit the public by enhancing communications for City emergency first responders.

5. Substantially affects public health;

   During project activities, there will be the potential for minor impacts to air quality, noise levels, and the generation of storm water runoff, which will be addressed through the application of appropriate mitigation measures as described in this EA. Once in operation, the Project is not anticipated to lead to an increase in the generation of noise, as compared to the existing tower. Unlike the existing unenclosed emergency generator, the new emergency generator will be installed within an enclosed generator room. As such, there may be a perceptible reduction in noise. Furthermore, transmitting antennas do not typically generate noise. No substantial adverse impacts to public health are anticipated, and no other mitigation measures are recommended.

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

   The Project is not anticipated to result in any adverse secondary or cumulative impacts involving an increase or major shift population or the demand for public facilities. The Project upon completion will substantively involve the same use of the site.

7. Involves substantial degradation of environmental quality;

   There will be no significant or substantial degradation of environmental quality based on the limited scope and scale of the proposed action. No adverse impacts are therefore, anticipated or expected to the environmental quality of the project area.

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

   The Project does not commit resources or energy for a larger action. There are no future phases of development and there is no commitment to a larger action. There are also no cumulative effects on ecosystem resources or human communities based on the project's limited scope and scale.

9. *Substantially affects any rare, threatened or endangered species or its habitat;*

   There are no known rare, threatened or endangered species or habitat located at the subject site.

10. *Detrimentally affects air or water quality or ambient noise levels;*

    As required, any potential impacts to air, water quality, or noise levels are anticipated to be construction related, and will be addressed through the implementation of appropriate mitigation measures described in this document. Once in operation, the Project is not anticipated to lead to an increase in the generation of noise, as compared to the existing tower. Unlike the existing unenclosed emergency generator, the new emergency generator will be installed within an enclosed generator room. As such, there may be a perceptible reduction in noise.

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

    The Project is not located in an environmentally sensitive area.

12. *Substantially affects scenic vistas and view planes identified in county or state plans or studies;*

    The Project will affect existing scenic vistas or view planes by adding 20 feet of height with the new communications tower. However, the additional height is needed to reduce interference between the various antennas and microwaves.

13. Requires substantial energy consumption.

Construction activities will result in a short-term increase in power demand. On the long-term, the new communication tower will have similar electrical needs to the existing tower. Electrical consumption is anticipated to be comparable to the existing condition due to the use of new energy-efficient equipment.

16.0 REFERENCES

City and County of Honolulu, Department of Planning and Permitting. 2004. Primary Urban Center (PUC) Development Plan (DP). May 2004.

City and County of Honolulu, Department of Planning and Permitting. General Plan. Amended 2002.

City and County of Honolulu, Honolulu Land Information System (HoLIS). 2010. Updated Tsunami Evacuation Zones for the Island of Oahu.

Federal Emergency Management Agency. 2004. Flood Insurance Rate Map. Number 150001. Panel 0165. Suffix: F. Map Number: 15003C0165F. September 30, 2004.

State of Hawai‘i, Department of Health. 2013. Hawai‘i Ambient Air Quality Data.

APPENDIX A

Tower Repair Report
Kaaawa – Honolulu, HI
100-ft. Self-Supporting Tower Repair
Prepared by Tower Engineering Company
December 2014

Ka'a'awa – Honolulu, HI

100-ft Self-Supporting Tower Repair

December 2014

TEC
TOWER ENGINEERING COMPANY

MADISON JEFFERY BATT
LICENSED PROFESSIONAL ENGINEER
No. 10130-S
HAWAII, U.S.A.
12/22/14

Tower Repair Report

November 2014

Prepared for:
Edmund Chang
Anbe, Aruga & Ishizu, Architects, Inc
1441 Kapiolani Boulevard, Ste 206
Honolulu HI, 96814

Prepared by:
Gareth Reece, PE
Tower Engineering Company
21907 64th Ave West, Suite 140
Mountlake Terrace, WA 98043-2298
(425) 640-2266
TEC Project No. 13028.10

Checked By:
Madison J. Batt, PE, SE
(425) 640-2266

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Appendix A – Tower Elevations – All Conditions
Appendix B – Stress Reports – All Conditions
Appendix B – Photo Log

1. Authorization/Purpose

Tower Engineering Company (TEC) was retained by Anbe, Aruga & Ishizu Architects, Inc to perform an assessment of the 100 foot self-supporting tower located adjacent to the Ka'a'awa fire station. The analysis was performed at the request of Edmund Chang to determine tower's structural compliance with current building standards, and to evaluate any possibilities for an interim repair to the tower to extend its life until budget is available for its replacement.

2. Tower Description

The 100 foot tower is three sided, and was manufactured by Rohn. It is constructed of four (4) tapered 20-foot sections with a base width of 14'-7" that tapers to 6'-6 ½" at the 80 foot level. An additional one (1) 20 foot section is straight to 100 feet. Tower members are hollow pipe legs with single angle diagonals and horizontals. The northwest leg of the tower provides a 3/8" diameter safety cable and climbing pegs for the full height of the tower. Several types of communication equipment are mounted to the tower, including two 8' diameter microwave dishes, a 6' diameter microwave dish, and multiple mast and yagi antennas.

3. Structural Analysis

The finite element analysis of the tower is conducted by applying design loads for various physical and environmental circumstances to a three-dimensional computer model, based on the physical tower. The computer model was created using tnxTower (formerly RISA Tower) v. 6.1.3.1, an analysis program released by Tower Numerix Inc. on August 18, 2011, and specifically created for communication towers, including self-support towers, guyed towers, and monopoles. The design standard, site topography, and physical properties of tower members, feedlines, and appurtenances are used by the program to define pressure coefficients, wind pressures, ice loads, and resulting forces to determine individual member stresses and capacities.

The model was created per the current design standard, ANSI/TIA-222-G, "Structural Standard for Antenna Supporting Structures and Antennas." The criteria established for this model were: structure class III, exposure category C and topographic category 1 with a crest height of 0 feet. The Honolulu county basic wind speed (3-second gust) is 105 miles per hour (mph) with no ice and 60 mph under service conditions. There is no ice loading recommendation for Honolulu County. Calculated member capacities and minimum safety factors used to evaluate the adequacy of the structure are in accordance with the current G version of the TIA standard.

Antenna Loading was based on direct observation of the tower on 11/19/2014 and archival records of equipment and feed lines.

The material yield strengths were assumed and are as follows:

- Round tube leg members: 36 kips per square inch (ksi) yield
- Diagonal members: 36 ksi yield
- Horizontal members: 36 ksi yield

4. Conditions Investigated

Due to the advanced deterioration of structural members on the Ka'a'awa tower, special considerations had to be made for analysis of the structure as it stands, and for proposed modifications to the tower. Direct measurements of typical and worst case structural members were made in the field to determine remaining steel thickness after rust, scale, and paint had been removed. The following existing conditions and proposed repairs were analyzed to determine the best course of action to preserve the tower structure:

1. Ideal Existing Structure Condition:

The ideal structure condition represents the as-designed, as-new structure under current loading and code provisions. No provisions are made for the advanced state of the tower deterioration. This is not a real-world analysis and is only meant for comparison against other cases to evaluate the effect of the deterioration on tower stresses.

2. Reduced Sections Due to Corrosion:

This is the current state of the tower structure with allowances for the deteriorated structure. Wall thicknesses of corroded pipe legs are reduced to measured thickness, leg thickness of corroded angles is reduced to measured thickness. This is the best representation of the code-level stresses on the tower as it stands.

3. Reduced Sections Due to Corrosion w/ Grout:

This model takes the reduced sections model and assesses the effect of adding solid grouting to the tower legs (Further investigation is required to determine if this installation is feasible).

4. Reduced Sections Due to Corrosion w/ Grout and Upgraded Diagonals:

This model adds two sections of upgraded diagonals to remove any governing stresses in easy-to-replace members such as diagonals and horizontals, and adds additional redundant horizontals where helpful to brace overstressed leg members.

5. Results

Table 5-1 summarizes the member results from the analysis by listing the maximum member stress percentages. The member stress percentage is the ratio of the actual member stress to the capacity of the member expressed as a percentage. A stress ratio greater than 105 percent denotes an overstress above conventional existing structure limits.

Table 5-1: Maximum Member Stresses (percent of capacity)

Member	Ideal Existing	Reduced Sections Due to Corrosion	Reduced Sections w/ Grout	Reduced Sections w/Grout and Upgrades
Leg	155% (00-20 feet)	167% (60-80 feet)	123% (00-20 feet)	108% (00-20 feet)
Diagonal	117% (40-60 feet)	166% (80-100 feet)	165% (80-100 feet)	103% (00-20 feet)
Top Girt	8% (60-80 feet)	7% (60-80 feet)	6% (60-80 feet)	12% (60-80 feet)

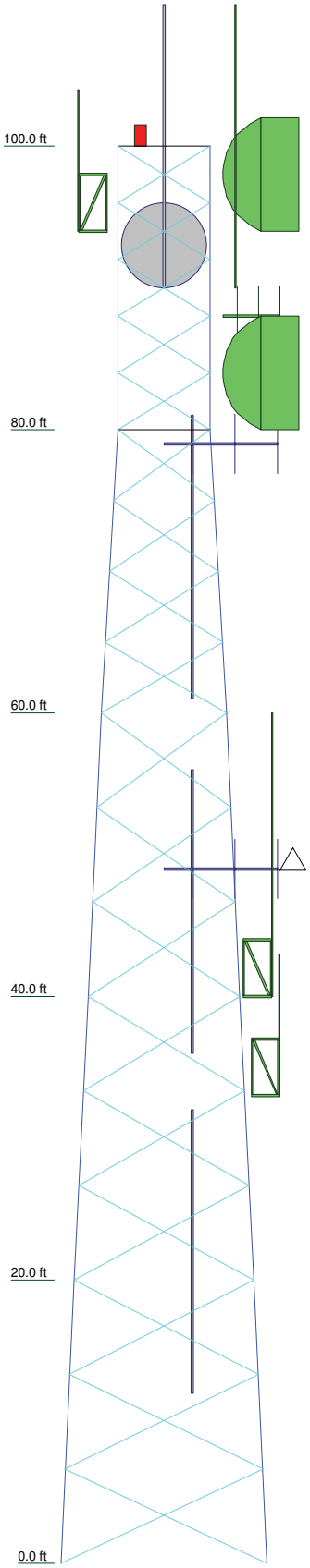
6. Conclusions

As the results show, the tower is under-designed in its original configuration for the current TIA-222 G revision of the design standard. In order to preserve the integrity of the communication system in the intervening time until a replacement structure can be provided, we suggest that the an upgrade project be developed involving the grouting of the legs, the replacement of problem diagonals, and the addition of redundant horizontals. During the upgrade procedure, the entire tower should be stripped of rust scale and re-coated with a suitable protective paint.

Appendix A

Tower Elevations – All Conditions

Section	T1	T2	T3	T4	T5
Legs	P2x.154	P2.5x.203 (2.875 OD)	P2.5x.276	P3x.3	
Leg Grade	A36				
Diagonals	L1 1/2x1 1/2x3/16	L2x2x3/16		L2 1/2x2 1/2x3/16	
Diagonal Grade	A36				
Top Girts	L2x2x3/16		N.A.		
Face Width (ft)	6.54167		8.85156	10.6198	12.6615 14.5833
# Panels @ (ft)	5 @ 4	4 @ 5	9 @ 6.66667		
Weight (lb)	717.3	972.8	1018.0	1402.4	1499.9 5610.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' mast	100	8' MW HP	84
20' mast	100	(2) (2) 2' left right yagis	79
OB lights	100	16' mast	71
2'x1'x1' box	99	20' mast	50
(2) (2) 10' up down masts	99	4' yagi	49
8' MW HP	98	20' mast	46
6' MW HP	93	10' mast	38
(2) (2) 3' left right yagis	88	20' mast	22

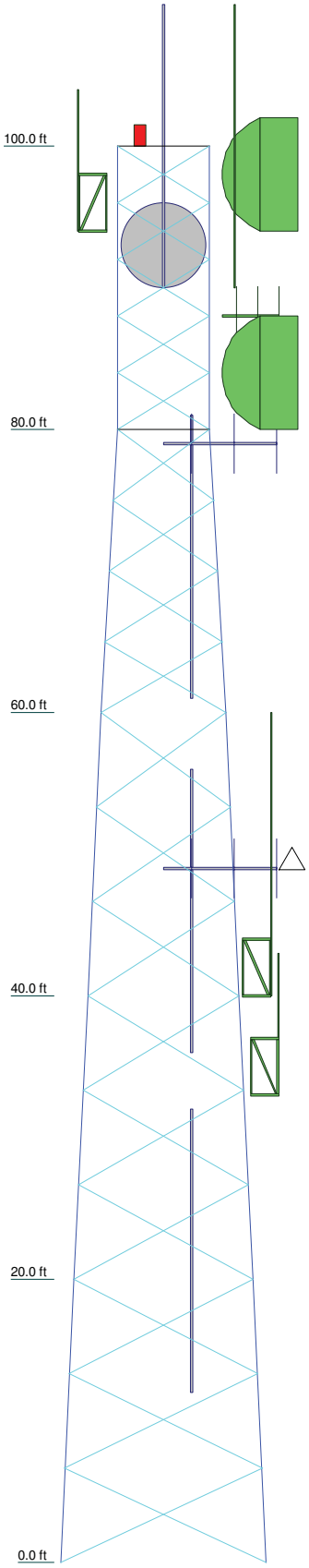
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TEC
Tower Engineering Company
21907 64th Ave W, Ste 140
Mountlake Terrace, WA 98043
Phone: (425) 640 2266
FAX:

Job: ***Kaaawa Ideal Condition Members***		
Project:		
Client:	Drawn by: Gareth Reece	App'd:
Code: TIA-222-G	Date: 12/23/14	Scale: NTS
Path: P:\14035.10 Kaawa FS Interim Repair (AA& I Architects)\05 Analysis & Design\Kaaawa Ideal Existing 2014.ar		Dwg No. E-1

Section	T1	T2	T3	T4	T5
Legs	Corroded P2x.154	Corroded P2.5x.203	P2.5x.276	P3x.3	
Leg Grade	A36				
Diagonals	Corroded L1.5x1.5x3/16	Corroded L2x2x3/16	L2x2x3/16	L2 1/2x2 1/2x3/16	
Diagonal Grade	A36				
Top Girts	L2x2x3/16		N.A.		
Face Width (ft)	6.54167		8.85156	10.6198	12.6615 14.5833
# Panels @ (ft)	5 @ 4	4 @ 5	9 @ 6.66667		
Weight (lb)	538.3	643.3	1018.0	1402.4	1499.9 5101.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' mast	100	8' MW HP	84
20' mast	100	(2) (2) 2' left right yagis	79
OB lights	100	16' mast	71
2'x1'x1' box	99	20' mast	50
(2) (2) 10' up down masts	99	4' yagi	49
8' MW HP	98	20' mast	46
6' MW HP	93	10' mast	38
(2) (2) 3' left right yagis	88	20' mast	22

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TEC
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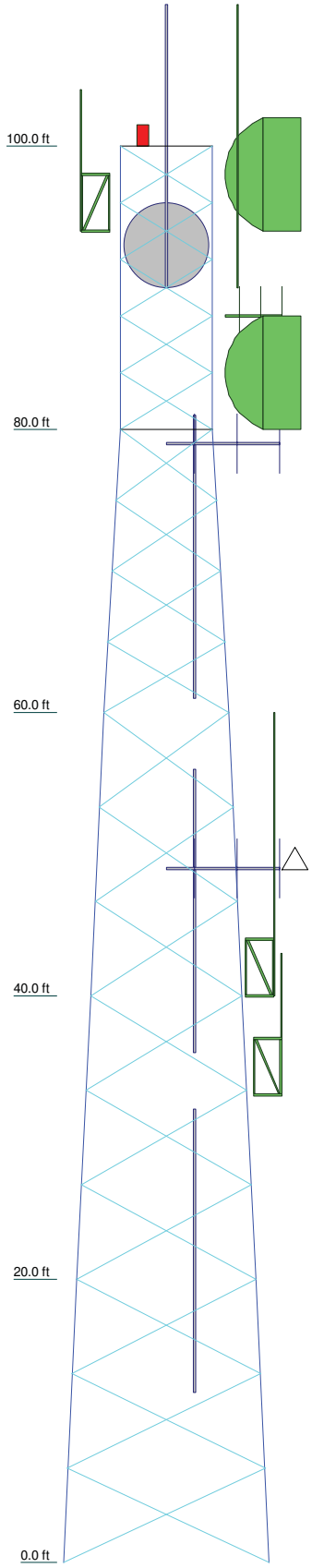
FAX:

Job: ***Kaaawa Reduced Sections Due to Corrosion 2014***		
Project:		
Client:	Drawn by: Gareth Reece	App'd:
Code: TIA-222-G	Date: 12/23/14	Scale: NTS
Path:		Dwg No. E-1

Section	T1	T2	T3	T4	T5
Legs	Corroded P2x.154 (GR)	Corroded P2.5x.203 (GR)	P2.5x.276 (GR)	P3x.3 (GR)	
Leg Grade	A36				
Diagonals	Corroded L1.5x1.5x3/16	Corroded L2x2x3/16	L2x2x3/16	L2 1/2x2 1/2x3/16	
Diagonal Grade	A36				
Top Girts	L2x2x3/16		N.A.		
Face Width (ft)	6.54167		8.85156	10.6198	12.6615 / 14.5833
# Panels @ (ft)	5 @ 4	4 @ 5	9 @ 6.66667		
Weight (lb)	764.3	951.4	1285.9	1820.1	1917.5 / 6739.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' mast	100	8' MW HP	84
20' mast	100	(2) (2) 2' left right yagis	79
OB lights	100	16' mast	71
2'x1'x1' box	99	20' mast	50
(2) (2) 10' up down masts	99	4' yagi	49
8' MW HP	98	20' mast	46
6' MW HP	93	10' mast	38
(2) (2) 3' left right yagis	88	20' mast	22

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TEC
Tower Engineering Company
21907 64th Ave W, Ste 140
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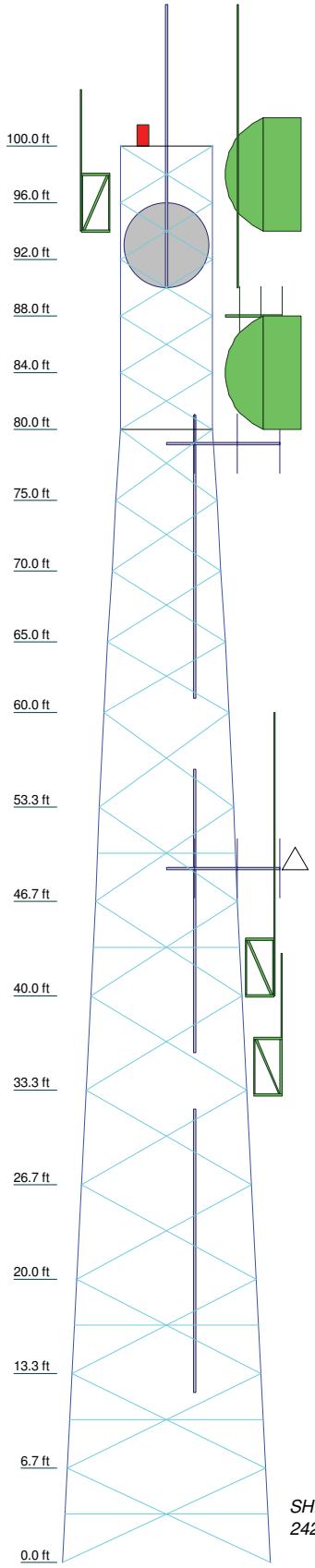
Phone: (425) 640 2266
FAX:

Job: ***Kaaawa Reduced Sections Due to Corrosion 2014 w/Grout***		
Project:		
Client:	Drawn by: Gareth Reece	App'd:
Code: TIA-222-G	Date: 12/23/14	Scale: NTS
Path:		Dwg No. E-1

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18
Legs	Corroded P2x.154 (GR)					A	P2.5x.203 (2.875 OD) (GR)			P2.5x.276 (GR)			P3x.3 (GR)					
Leg Grade	A36																	
Diagonals	L1 1/2x1 1/2x1/4					L2x2x1/4							L2 1/2x2 1/2x3/16					
Diagonal Grade	A36																	
Top Girts	N.A.					L2x2x3/16	N.A.						N.A.					
Sec. Horizontals	B					N.A.					L3x3x3/8			N.A.			L3x3x3/8	
Face Width (ft) 14.5833	6.54167						7.11979	7.69792	8.27344	8.85156	9.4401	10.0313	10.6198	11.2995	11.9818	12.6615	13.3021	13.9427
# Panels @ (ft) 8947.9	5 @ 4						4 @ 5				9 @ 6.66667							
Weight (lb)	243.3	195.1	195.1	195.1	195.1	352.0	344.3	353.7	363.2	473.5	694.5	716.8	595.7	606.6	617.7	910.7	935.3	960.0



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' mast	100	8' MW HP	84
20' mast	100	(2) (2) 2' left right yagis	79
OB lights	100	16' mast	71
2'x1'x1' box	99	20' mast	50
(2) (2) 10' up down masts	99	4' yagi	49
8' MW HP	98	20' mast	46
6' MW HP	93	10' mast	38
(2) (2) 3' left right yagis	88	20' mast	22

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Corroded P2.5x.203 (GR)	B	L2x2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in Honolulu County, Hawaii.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower Structure Class III.
5. Topographic Category 1 with Crest Height of 0'
6. Grouted pipe f'c is 8 ksi
7. Weld together tower sections have flange connections.
8. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
9. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
10. Welds are fabricated with ER-70S-6 electrodes.
11. TOWER RATING: 107.7%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 124012 lb
SHEAR: 14477 lb

UPLIFT: -108538 lb
SHEAR: 12827 lb

AXIAL
14743 lb

SHEAR
24231 lb

MOMENT
1504 kip-ft

TORQUE 20 kip-ft
REACTIONS - 105 mph WIND

Tower Engineering Company
21907 64th Ave W, Ste 140
Mountlake Terrace, WA 98043
Phone: (425) 640 2266
FAX:

Job: ***Kaaawa Reduced Sections Due to Corrosion 2014 w/Grout and Upgraded Diagonals, Horizontals***

Project:		
Client:	Drawn by: Gareth Reece	App'd:
Code: TIA-222-G	Date: 12/23/14	Scale: NTS
Path: P:\14035.10 Kaawa FS Interim Repair (AA& I Architects)\05 Analysis & Design\Kaaawa 2014 mlb edits.en		Dwg No. E-1

Appendix B

Stress Reports – All Conditions

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	100 - 80	Leg	P2x.154	2	-19209.80	28624.80	67.1	Pass
		Diagonal	L1 1/2x1 1/2x3/16	10	-6291.70	5451.87	115.4	Fail ✗
		Top Girt	L2x2x3/16	6	-28.08	4673.29	0.6	Pass
T2	80 - 60	Leg	P2.5x.203 (2.875 OD)	38	-46719.50	44660.40	104.6	Fail ✗
		Diagonal	L2x2x3/16	52	-5235.91	8091.46	64.7 90.4 (b)	Pass
		Top Girt	L2x2x3/16	42	-433.84	5931.28	7.3	Pass
T3	60 - 40	Leg	P2.5x.276	68	-71013.40	49158.40	144.5	Fail ✗
		Diagonal	L2x2x3/16	73	-5506.85	4719.19	116.7	Fail ✗
T4	40 - 20	Leg	P3x.3	89	-94346.40	75206.00	125.5	Fail ✗
		Diagonal	L2 1/2x2 1/2x3/16	94	-4993.56	7222.45	69.1 79.3 (b)	Pass
T5	20 - 0	Leg	P3x.3	110	-116508.00	75213.80	154.9	Fail ✗
		Diagonal	L2 1/2x2 1/2x3/16	115	-5437.40	5722.13	95.0	Pass
							Summary	
						Leg (T5)	154.9	Fail ✗
						Diagonal (T3)	116.7	Fail ✗
						Top Girt (T2)	7.3	Pass
						Bolt Checks	99.4	Pass
						RATING =	**154.9**	**Fail ✗**

tnxTower	Job: Kaaawa Reduced Sections Due to Corrosion 2014	Page: 1 of 1
Tower Engineering Company 21907 64th Ave W, Ste 140 Mountlake Terrace, WA 98043 Phone: (425) 640 2266 FAX:	Project:	Date: 17:04:51 12/15/14
	Client:	Designed by: Gareth Reece

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	100 - 80	Leg	Corroded P2x.154	2	-19155.30	22771.10	84.1	Pass
		Diagonal	Corroded L1.5x1.5x3/16	10	-6281.90	3787.55	165.9	Fail ✗
		Top Girt	L2x2x3/16	6	-35.25	4673.29	0.8	Pass
T2	80 - 60	Leg	Corroded P2.5x.203	38	-46355.80	27786.00	166.8	Fail ✗
		Diagonal	Corroded L2x2x3/16	46	-4684.92	4119.50	113.7 134.9 (b)	Fail ✗
		Top Girt	L2x2x3/16	42	-392.05	5931.28	6.6	Pass
T3	60 - 40	Leg	P2.5x.276	68	-70549.00	49158.40	143.5	Fail ✗
		Diagonal	L2x2x3/16	73	-5452.71	4719.19	115.5	Fail ✗
T4	40 - 20	Leg	P3x.3	89	-93693.40	75206.00	124.6	Fail ✗
		Diagonal	L2 1/2x2 1/2x3/16	94	-4969.50	7222.45	68.8 78.9 (b)	Pass
T5	20 - 0	Leg	P3x.3	110	-115768.00	75213.80	153.9	Fail ✗
		Diagonal	L2 1/2x2 1/2x3/16	115	-5415.25	5722.13	94.6	Pass
							Summary	
						Leg (T2)	166.8	Fail ✗
						Diagonal (T1)	165.9	Fail ✗
						Top Girt (T2)	6.6	Pass
						Bolt Checks	149.2	Fail ✗
						RATING =	**166.8**	**Fail ✗**

Program Version 6.1.3.1 - 7/25/2013 File:P:/14035.10 Kaawa FS Interim Repair (AA& I Architects)/05 Analysis & Design/Kaaawa 2014 with Reduced Sections due to Corrosion.eri

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	100 - 80	Leg	Corroded P2x.154 (GR)	1	16628.80	27543.70	60.4	Pass
		Diagonal	Corroded L1.5x1.5x3/16	10	-6243.99	3787.55	164.9	Fail ✗
		Top Girt	L2x2x3/16	6	-48.69	4673.29	1.0	Pass
T2	80 - 60	Leg	Corroded P2.5x.203 (GR)	37	42305.20	34668.90	122.0	Fail ✗
		Diagonal	Corroded L2x2x3/16	46	-4675.40	4119.50	113.5 134.5 (b)	Fail ✗
		Top Girt	L2x2x3/16	40	-307.16	5931.28	5.2	Pass
T3	60 - 40	Leg	P2.5x.276 (GR)	68	-70867.20	58204.30	121.8	Fail ✗
		Diagonal	L2x2x3/16	73	-5449.50	4719.19	115.5	Fail ✗
T4	40 - 20	Leg	P3x.3 (GR)	89	-94178.10	94666.00	99.5	Pass
		Diagonal	L2 1/2x2 1/2x3/16	94	-4965.48	7222.45	68.8 79.0 (b)	Pass
T5	20 - 0	Leg	P3x.3 (GR)	110	-116437.00	94678.00	123.0	Fail ✗
		Diagonal	L2 1/2x2 1/2x3/16	115	-5394.74	5722.13	94.3	Pass
							Summary	
						Leg (T5)	123.0	Fail ✗
						Diagonal (T1)	164.9	Fail ✗
						Top Girt (T2)	5.2	Pass
						Bolt Checks	148.5	Fail ✗
						RATING =	**164.9**	**Fail ✗**

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	100 - 96	Leg	Corroded P2x.154 (GR)	2	-1334.80	35883.70	10.2	Pass
T2	96 - 92	Leg	Corroded P2x.154 (GR)	14	-3827.87	35883.70	10.7	Pass
T3	92 - 88	Leg	Corroded P2x.154 (GR)	22	6560.21	27543.70	23.8	Pass
T4	88 - 84	Leg	Corroded P2x.154 (GR)	31	10974.90	27543.70	39.8	Pass
T5	84 - 80	Leg	Corroded P2x.154 (GR)	40	16536.50	27543.70	60.0	Pass
T6	80 - 75	Leg	Corroded P2.5x.203 (GR)	49	23459.00	34668.90	67.7	Pass
T7	75 - 70	Leg	P2.5x.203 (2.875 OD) (GR)	62	-34392.40	60865.20	56.5	Pass
T8	70 - 65	Leg	P2.5x.203 (2.875 OD) (GR)	71	-40325.60	60865.80	66.3	Pass
T9	65 - 60	Leg	P2.5x.203 (2.875 OD) (GR)	80	-47152.30	60865.20	77.5	Pass
T10	60 - 53.3333	Leg	P2.5x.276 (GR)	89	-54133.60	58204.50	93.0	Pass
T11	53.3333 - 46.6667	Leg	P2.5x.276 (GR)	97	56628.70	73014.70	77.6	Pass
T12	46.6667 - 40	Leg	P2.5x.276 (GR)	109	64152.10	73014.70	87.9	Pass
T13	40 - 33.3333	Leg	P3x.3 (GR)	122	-80528.00	94666.30	85.1	Pass
T14	33.3333 - 26.6667	Leg	P3x.3 (GR)	131	-88348.20	94665.50	93.3	Pass
T15	26.6667 - 20	Leg	P3x.3 (GR)	140	-96208.00	94666.30	101.6	Fail ✗
T16	20 - 13.3333	Leg	P3x.3 (GR)	148	91900.20	97716.10	94.0	Pass
T17	13.3333 - 6.66667	Leg	P3x.3 (GR)	160	98721.10	97716.10	101.0	Fail ✗
T18	6.66667 - 0	Leg	P3x.3 (GR)	172	105241.00	97716.10	107.7	Fail ✗
T1	100 - 96	Diagonal	L1 1/2x1 1/2x1/4	7	-1365.17	7042.84	19.4	Pass
T2	96 - 92	Diagonal	L1 1/2x1 1/2x1/4	19	-3234.32	7042.84	45.9	Pass
T3	92 - 88	Diagonal	L1 1/2x1 1/2x1/4	27	-3626.92	7042.84	51.5	Pass
T4	88 - 84	Diagonal	L1 1/2x1 1/2x1/4	37	-3717.68	7042.84	52.8	Pass
T5	84 - 80	Diagonal	L1 1/2x1 1/2x1/4	46	-6319.64	7042.84	89.7	Pass
T6	80 - 75	Diagonal	L2x2x1/4	58	-6015.28	12850.60	46.8 75.6 (b)	Pass
T7	75 - 70	Diagonal	L2x2x1/4	66	-5260.24	11643.90	45.2 69.2 (b)	Pass
T8	70 - 65	Diagonal	L2x2x1/4	76	-5338.99	10467.90	51.0 67.1 (b)	Pass
T9	65 - 60	Diagonal	L2x2x1/4	84	-4766.98	9435.61	50.5 62.7 (b)	Pass
T10	60 - 53.3333	Diagonal	L2x2x1/4	94	-5607.55	7201.70	77.9	Pass
T11	53.3333 - 46.6667	Diagonal	L2x2x1/4	103	-5442.98	6618.73	82.2	Pass
T12	46.6667 - 40	Diagonal	L2x2x1/4	115	-5732.20	6097.29	94.0	Pass
T13	40 - 33.3333	Diagonal	L2 1/2x2 1/2x3/16	127	-5158.61	8629.34	59.8 81.5 (b)	Pass
T14	33.3333 - 26.6667	Diagonal	L2 1/2x2 1/2x3/16	136	-5221.40	7882.44	66.2 81.1 (b)	Pass
T15	26.6667 - 20	Diagonal	L2 1/2x2 1/2x3/16	145	-5103.73	7222.57	70.7 81.4 (b)	Pass
T16	20 - 13.3333	Diagonal	L2 1/2x2 1/2x3/16	154	-5548.40	6671.27	83.2 85.7 (b)	Pass
T17	13.3333 - 6.66667	Diagonal	L2 1/2x2 1/2x3/16	166	-5434.41	6171.59	88.1	Pass
T18	6.66667 - 0	Diagonal	L2 1/2x2 1/2x3/16	178	-5850.67	5722.13	102.2	Fail ✗
T11	53.3333 - 46.6667	Secondary Horizontal	L3x3x3/8	106	-1097.46	17266.10	6.4	Pass
T12	46.6667 - 40	Secondary Horizontal	L3x3x3/8	119	-1243.92	15630.20	8.0	Pass
T16	20 - 13.3333	Secondary Horizontal	L3x3x3/8	157	-1801.77	10683.40	16.9	Pass
T17	13.3333 - 6.66667	Secondary Horizontal	L3x3x3/8	169	-1943.78	9841.99	19.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T18	6.66667 - 0	Secondary Horizontal	L3x3x3/8	181	-2079.81	9100.27	22.9	Pass
T1	100 - 96	Top Girt	L2x2x3/16	6	-20.70	4673.29	0.4	Pass
T6	80 - 75	Top Girt	L2x2x3/16	54	-679.32	5931.28	11.5	Pass
							Summary	
						Leg (T18)	107.7	Fail ✗
						Diagonal (T18)	102.2	Fail ✗
						Secondary Horizontal (T18)	22.9	Pass
						Top Girt (T6)	11.5	Pass
						Bolt Checks	88.0	Pass
						RATING =	**107.7**	**Fail ✗**

Appendix C

Tower Condition Photo Log

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Photo 1 – Tower Elevation

Photo 2 – B leg Diagonal Deterioration at 40' Elevation

Photo 3 – Bottom of Diagonal at 60' elevation on leg B

Photo 4 – Scaling of angle at approximately 65 feet

Photo 5 – Deterioration of gussets at 60' elevation

Photo 6 – Cleaning the surface of the pipe leg at the 80' level for assessment

Photo 7 – Typical 60' splice condition

Photo 8 – Typical 80' splice condition

Photo 9 – 80' splice after removal of scale

APPENDIX B

Draft
Archaeological Assessment Study for the
Ka‘a‘awa Fire Station Facility Improvements and Tower Replacement Project,
Ka‘a‘awa Ahupua‘a, Ko‘olauloa District, O‘ahu
TMK: [1] 5-1-011:051 por.

Prepared by Cultural Surveys Hawai‘i, Inc.
August 2017

Draft

Archaeological Assessment Study for the Ka‘a‘awa Fire Station Facility Improvements and Tower Replacement Project, Ka‘a‘awa Ahupua‘a, Ko‘olauloa District, O‘ahu TMK: [1] 5-1-011:051 por.

Prepared for
City and County of Honolulu
Department of Information Technology
and
Department of Design and Construction

At the Request of
R. M. Towill Corporation

Prepared by
Jennifer Robins, B.A.
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai‘i, Inc.
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(Job Code: KAAAWA 3)

August 2017

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Management Summary

Reference	Archaeological Assessment for the Ka‘a‘awa Fire Station Communications Tower Project, Ka‘a‘awa Ahupua‘a, Ko‘olauloa District, O‘ahu, TMK: [1] 5-1-011:051 por.
Date	August 2017
Project Number(s)	Cultural Surveys Hawai‘i, Inc. (CSH) Job Code: KAAAWA 3
Investigation Permit Number	CSH completed the archaeological assessment (AA) fieldwork under archaeological fieldwork permit number 16-26, issued by the Hawai‘i State Historic Preservation Division (SHPD) per Hawai‘i Administrative Rules (HAR) §13-13-282.
Agencies	SHPD, City & County of Honolulu
Land Jurisdiction	City & County of Honolulu
Project Proponent	City & County of Honolulu
Project Funding	City & County of Honolulu
Project Location	Ka‘a‘awa Ahupua‘a, Ko‘olauloa District, O‘ahu, TMK: [1] 5-1-011:051 por., shown on a 1992 Kahana U.S. Geological Survey (USGS) topographic quadrangle.
Project Description	The proposed Ka‘a‘awa Fire Station Communications Facility project area is defined by a 3,180 square foot (sq ft) area (0.07 acre) located on the west side of the current Ka‘a‘awa Fire Station, which is bordered by Kamehameha Highway on the northeast, Huamalani Road on the northwest, and Lihimauna Road on the southwest. The proposed project includes construction of a 120-ft communications tower and generator building (CMU building), removal of an existing 100-ft communications tower and generator structure, and renovation of an existing equipment building.
Project Acreage	Approximately 1.02 hectare (0.07 acre)
AA Scope[i]	This archaeological assessment (AA) focused on archaeological historic properties and burial sites per the guidelines of HAR §13-276. The identification, documentation, and evaluation of in-use potential architectural historic properties such as historic buildings and structures was outside the scope of this archaeological inventory survey (AIS). Throughout this report the term “historic properties” is used and should be generally understood to refer to archaeological historic properties, unless otherwise stated.
Area of Potential Effect (APE)[ii] **and Survey Coverage**	The APE for this project area is defined by the entire 0.07-acre project area.
Historic Preservation	This AA fulfills the requirements of HAR §13-13-276 and was conducted to identify, document, and assess significance of any historic

Regulatory Context[iii]	properties. This document is intended to support the proposed project's historic preservation review under Hawai‘i Revised Statutes (HRS) §6E-8 and HAR §13-13-275. It is also intended to support any project-related historic preservation consultation with stakeholders such as state and county agencies and interested Native Hawaiian Organizations (NHOs) and community groups. No previous archaeological investigations were conducted within the project area.
Fieldwork Effort	Fieldwork was accomplished on 31 March and 1 April 2016 by Michelle Pammer, B.A., Jennifer Robins, B.A., and Karl Van Ryzin, B.A., under the general supervision of Hallett H. Hammatt, Ph.D., Principal Investigator. This work required approximately 6 person-days to complete.
Historic Properties Identified and Historic Property Significance	No designated state inventory of historic properties (SIHP) are located in the project area.
Effect Recommendation[iv]	CSH's project specific effect recommendation is "no historic properties affected." No cultural resources were identified in the project area.
Mitigation Recommendations	No historic properties were identified in the project area and no further archaeological mitigation is recommended.

[ii] "Project Area" is defined (HAR §13-275-2) as "the area the proposed project may potentially affect, either directly or indirectly. It includes not only the area where the proposed project will take place, but also the proposed project's area of potential effect." "Effects include, but are not limited to, partial or total destruction or alteration of the historic property, detrimental alteration of the properties' surrounding environment, detrimental visual, spatial, noise or atmospheric impingement, increasing access with the chances of resulting damage, and neglect resulting in deterioration" (HAR §13-275-7[b]). Based on these definitions of "project area" and "effects" there is potential for project effects to historic properties to extend outside the footprint of project construction. Accordingly a definition and justification of the "project area" and "area of potential effect" employed in the AIS study is required.

[iii] The State of Hawai‘i historic preservation review process is designed to identify and mitigate a project's impacts to significant historic properties. Historic properties are defined as "any building, structure, object, district, area, or site, including *heiau* [temple] and underwater site, which is over fifty years old" (HAR §13-275-2). The six potential historic preservation review steps include the following: 1) identification and inventory, to determine if historic properties are present in the project's area and, if so, to identify and document (inventory) them; 2) evaluation of historic property significance; 3) determination of project effect (impact) on significant historic properties; 4) mitigation commitments that commit to acceptable forms of mitigation in order to properly handle or minimize impacts to significant historic properties; 5) detailed mitigation plan, scope of work to properly carry out the general mitigation commitments; and 6) verification of completion of detailed mitigation plan (HAR §13-275-3). A project's effect and potential mitigation measures are evaluated based on the project's potential impact to "significant" historic properties (those historic properties determined significant following their evaluation of significance [HAR §13-275-6]).

[iv] One of two effect determinations must be established: 1) “No historic properties affected,” the project will have no effect on significant historic properties; or 2) “Effect, with proposed mitigation commitments,” the project will affect one or more significant historic properties, and the effects will potentially be harmful. However, the agency has proposed mitigation commitments involving one or more forms of mitigation to reasonably and acceptably mitigate the harmful effects (HAR § 13-275-7).

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Section 1 Introduction

1.1 Project Background

At the request of R. M. Towill Corporation on behalf of the City and County of Honolulu Department of Information Technology and Department of Design and Construction, Cultural Surveys Hawai‘i, Inc. (CSH) has prepared this archaeological assessment (AA) for the proposed Ka‘a‘awa Fire Station Communications project in Ka‘a‘awa Ahupua‘a, Ko‘olauloa District, O‘ahu, TMK: [1] 5-1-011:051. The project area is depicted on a portion of the 1998 Kahana U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1), a tax map plat (Figure 2), and a 2013 aerial photograph (Figure 3).

The project area is situated in the residential section of Ka‘a‘awa Ahupua‘a south of Pūlā‘ī Point, currently referred to as Ka‘a‘awa Point. The Ka‘a‘awa Fire Station borders the east side of the project area and public roadways border the remaining sides, with Kamehameha Highway on the northwest, Huamalani Road on the northwest side, and Lihimauna Road on the southwest. Swanzy Beach Park is northeast of the project area.

The project area consists of a raised manicured lawn in the north and City & County of Honolulu telecommunications facility in the south (Figure 5 and Figure 6). The telecommunications facility is within a locked chain-link fence and includes a 100-ft telecommunications tower, generator shed, above-ground fuel line, overhead power and transmission lines, and an abandoned propane tank.

The Ka‘a‘awa Fire Station Communications Facility project proposes ground disturbance related to 1) removal of the 100-ft telecommunications tower and generator located in the southeast portion of the project area, 2) construction of a new one-story generator building (CMU building) at the site of the former 100-ft tower, and 3) construction of a new 120-ft telecommunications tower in the north portion of the project area. Ground disturbance for the CMU building will include excavations for a foundation measuring 16 ft by 24 ft at 1.5 ft below surface with footings extending to approximately 2.5 ft below surface. Ground disturbance for the new tower will include excavation for four micropile caps, each 9 ft square with four connecting grade beams to a depth of approximately 5 ft below surface. Each of the four pile caps will include 12 micropiles drilled to a depth of approximately 35 ft below surface. Additionally, concrete footings for a chain link fence and concrete wall will extend approximately 3 ft below surface.

The area of potential effect (APE) is defined by the 3,180 square foot (sq ft) (0.07 acre) project area that contains these construction elements and an existing equipment storage building slated for renovation in the southeast corner of the project area.

The goal of the archaeological inventory survey (AIS) was to test areas within or near proposed ground disturbances associated with the new 120-ft communication tower and CMU building—the latter of which included the 100-ft tower and generator shed proposed for removal. The equipment storage building was not included in the AIS investigation because no ground disturbances are proposed there.

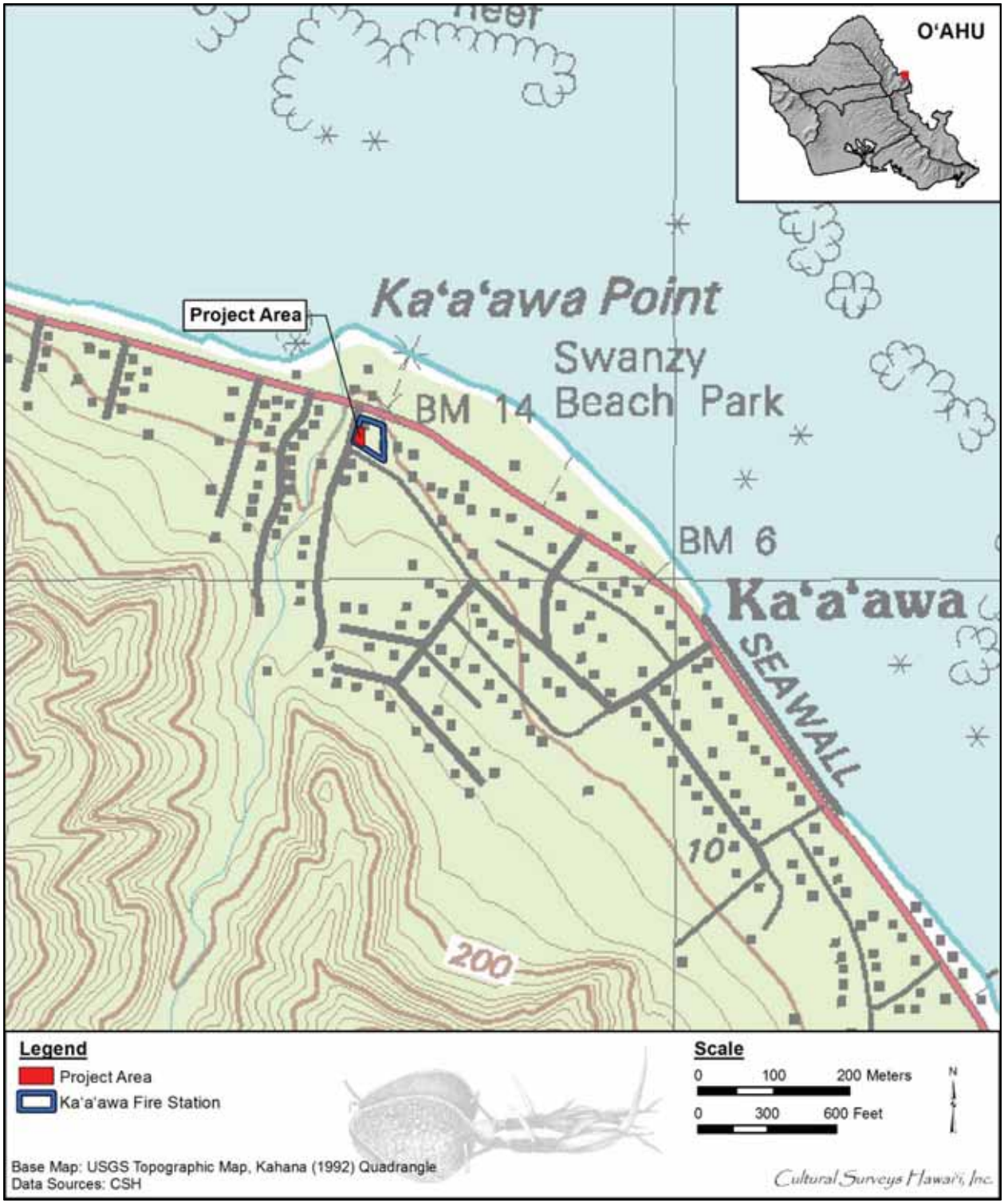


Figure 1. Portion of the 1992 Kahana USGS 7.5-minute topographic quadrangle showing the location of the project area

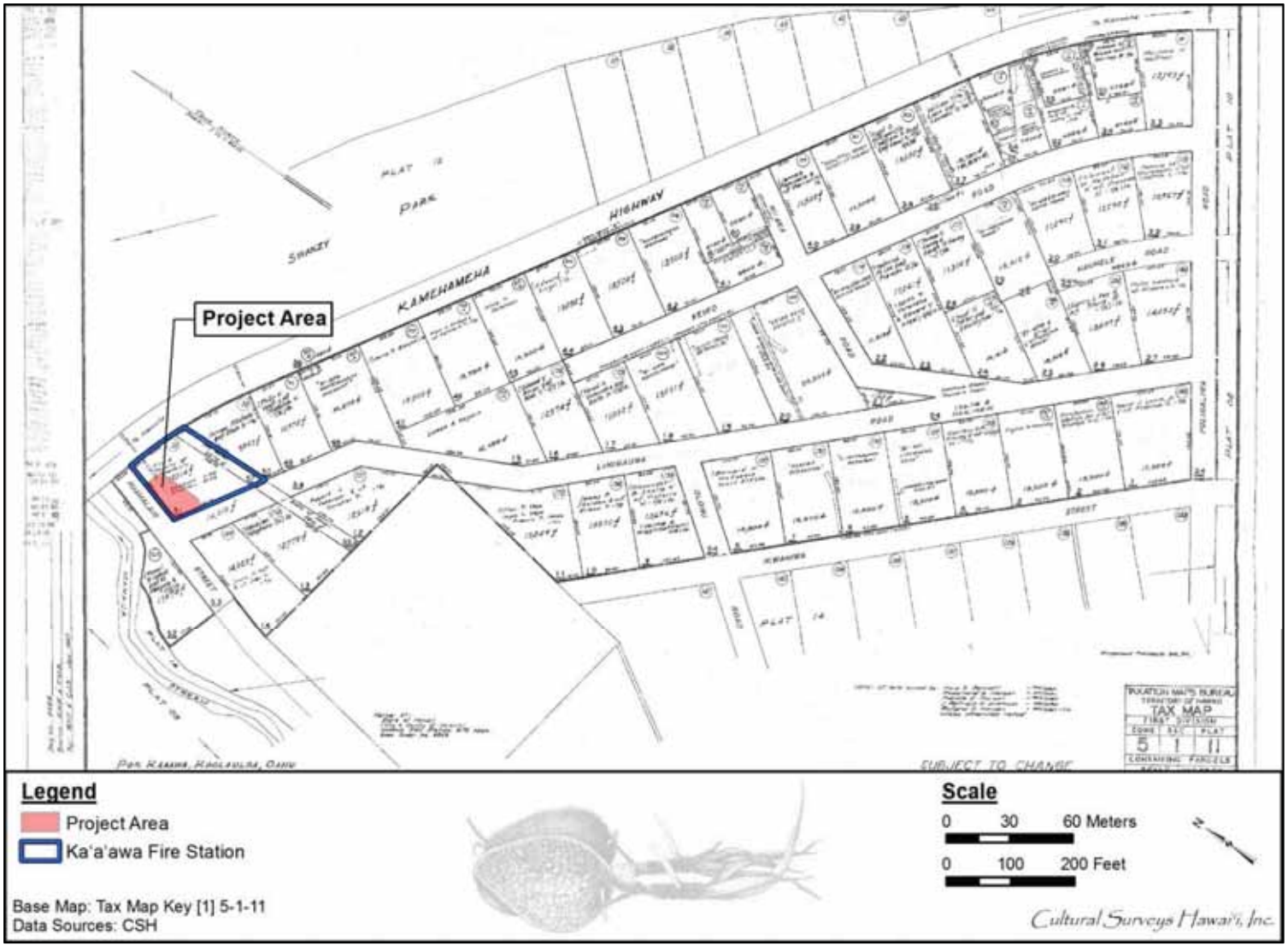


Figure 2. Tax Map Key (TMK) [1] 5-1-011 showing the project area (Hawai‘i TMK Service 2014)

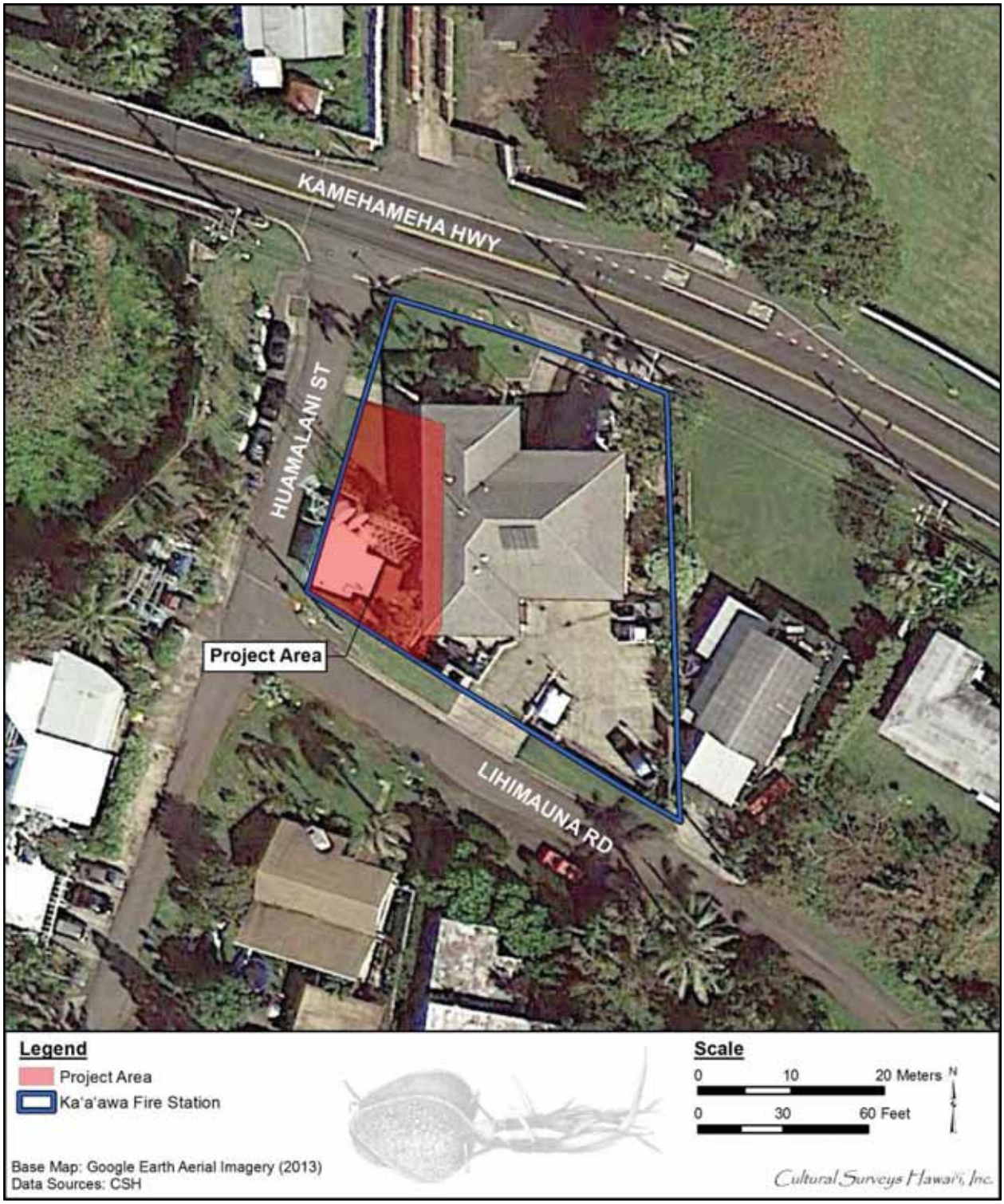


Figure 3. Aerial photograph showing project area (Google 2013)

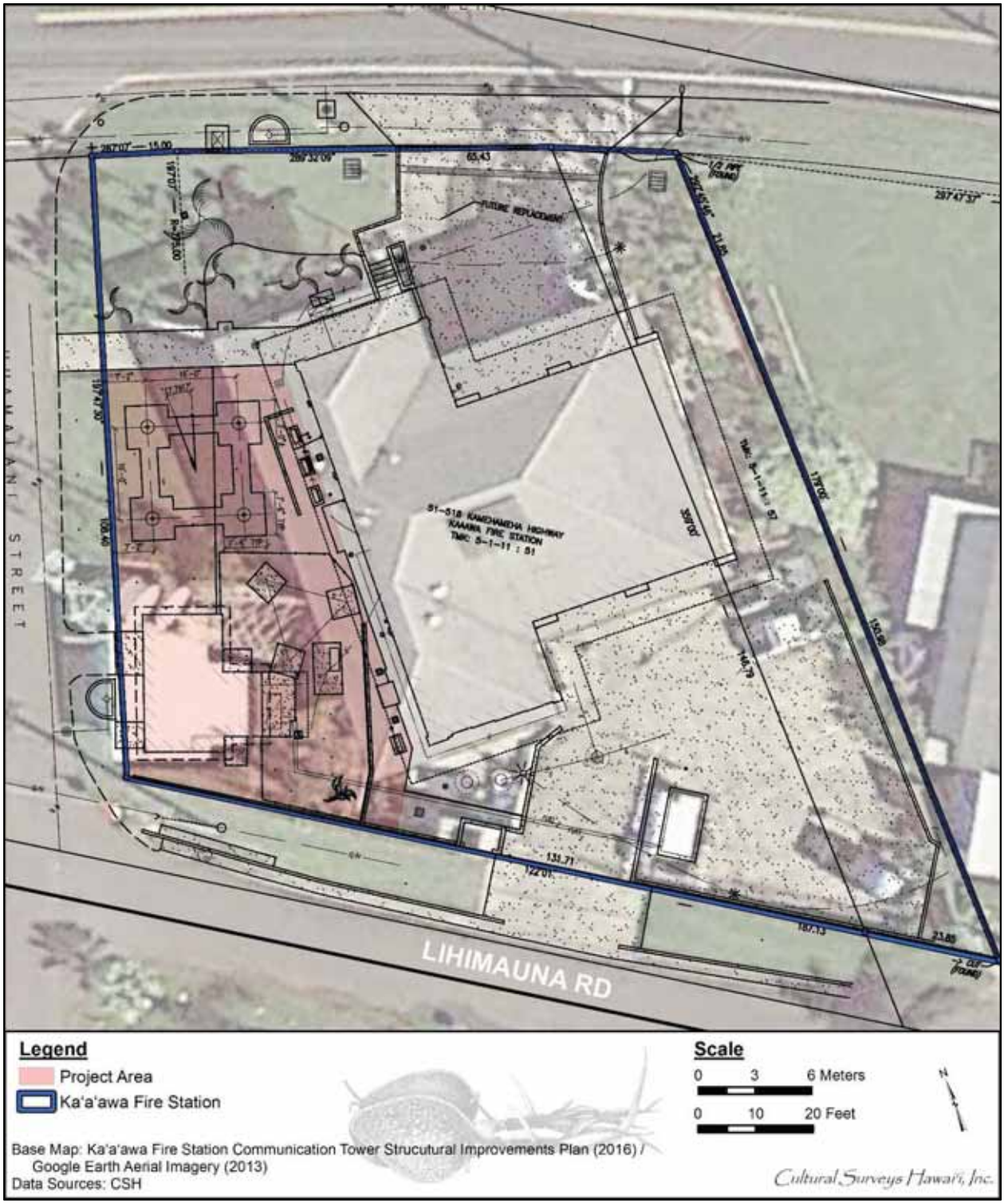


Figure 4. Equipment floor plan (September 2015) of Ka‘a‘awa Fire Station Communication Facility improvements and tower replacement (courtesy of client)

Figure 5. Photograph of project area, showing City & County of Honolulu telecommunications facility (upper right) and Ka‘a‘awa Fire Station (upper left); view to south

Figure 6. Photograph of west portion of project area, showing City & County of Honolulu telecommunications facility battery storage building on right; view to north

1.2 Historic Preservation Regulatory Context and Document Purpose

This AA fulfills the requirements of Hawai‘i Administrative Rules (HAR) §13-13-276 and was conducted to identify, document, and assess significance of any historic properties. This document is intended to support the proposed project’s historic preservation review under Hawai‘i Revised Statutes (HRS) §6E-8 and HAR §13-13-275. It is also intended to support any project-related historic preservation consultation with stakeholders such as state and county agencies, interested Native Hawaiian Organizations (NHOs), and community groups.

Because no historic properties were identified within the project area during the archaeological inventory survey (AIS), this investigation is termed an archaeological assessment (AA), per HAR §13-13-275-5(b)(5)(A): “Results of the survey shall be reported either through an archaeological assessment, if no sites were found, or an archaeological survey report which meets the minimum standards set forth in chapter 13-276-5.”

1.3 Scope of Work

The following archaeological inventory scope of work was designed to satisfy the Hawai‘i state requirements for archaeological inventory surveys (HAR §13-276 and §13-275/284):

1) Historic and archaeological background research, including a search of historic maps, written records, Land Commission Award documents, and the reports from prior archaeological investigations. This research focused on the specific project area’s past land use, with general background on the pre-Contact and historic settlement patterns of the *ahupua‘a* (traditional land division) and district. This background information was used to compile a predictive model for the types and locations of historic properties that could be expected within the project area.

2) A complete (100%) systematic pedestrian inspection of the project area to identify any potential surface historic properties. Surface historic properties were recorded with an evaluation of age, function, interrelationships, and significance. Documentation included photographs, scale drawings, and, if warranted, limited controlled excavation of select sites and/or features.

3) Based on the project area’s environment and the results of the background research, subsurface testing with a combination of hand and backhoe excavation was used to identify and document subsurface historic properties not located by surface pedestrian inspection. Appropriate samples from these excavations were analyzed for cultural and chronological information. All subsurface historic properties identified were documented to the extent possible, including geographic extent, content, function/derivation, age, interrelationships, and significance.

4) As appropriate, consultation with knowledgeable individuals regarding the project area’s history, past land use, and the function and age of the historic properties documented within the project area.

5) As appropriate, laboratory work to process and gather relevant environmental and/or archaeological information from collected samples.

6) Preparation of the inventory survey report (now an archaeological assessment report), including the following:

   a) A project description;
   b) A section of a USGS topographic map showing the project area boundaries and the location of all recorded historic properties;
   c) Historical and archaeological background sections summarizing prehistoric and historic land use of the project area and its vicinity;
   d) Descriptions of all historic properties, including selected photographs, scale drawings, and discussions of age, function, laboratory results, and significance, per the requirements of HAR §13-276. Each historic property will be assigned a SIHP number;
   e) If appropriate, a section concerning cultural consultations (per the requirements of HAR §13-276-5[g] and HAR §13-275/284-8[a][2]).
   f) A summary of historic property categories, integrity, and significance based upon the State of Hawai‘i historic property significance criteria;
   g) A project effect recommendation;
   h) Treatment recommendations to mitigate the project’s adverse effect on any significant historic properties identified in the project area.

If historic properties and/or cultural deposits were located, there were specific requirements for documentation including written descriptions and recording their geographic location with a GPS on project area maps. Documentation may include, as appropriate, section drawings and stratigraphic profiles, plan views, and photographs. If historic properties had been found, required analysis of located historic properties (or potential historic properties) included any or all of the following:

- analysis of recovered artifacts and midden from traditional Hawaiian deposits,
- analysis of historic artifacts from historic-era deposits, and
- radiocarbon dating of samples from cultural contexts.

The scope of work includes coordination with the SHPD relating to archaeological matters. This coordination takes place after consent of the owner and/or project proponents.

1.4 Environmental Setting

1.4.1 Natural Environment

The 0.07-acre project area is situated on the northeast coast of O‘ahu Island at roughly 12 m (40 ft) above sea level and 100 m inland from the windward coastline. The project landscape is level and composed of a landscaped lawn in the northern-*makai* (seaward) portion and a dense concentration of structures in the southern-*mauka* (inland, toward the mountains) portion. Vegetation is dominated by the grass lawn, partly bordered by red ginger, (*Alpinia purpurata*), *ti* (*Cordyline fruticose*), *naupaka*, (*Scaevola taccada*) and a plumeria (*Plumeria rubra*) tree.

Ka‘a‘awa Ahupua‘a contains two streams, a perennial stream (Ka‘a‘awa Stream) in the south and an intermittent stream (Makaua Stream) in the north and 20 m west of the current project area. As indicated by a neighboring resident, Makaua Stream descends quickly from the nearby ridges and is known to flood and undercut the stream bed during heavy rains. The climate is wet due to its windward location, with a mean annual rainfall of 136.63 cm (53.7 in) (Giambelluca et al. 2016).

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Foote et al. (1972), the project area's soils consist of Lolekaa silty clay derived solely from terrestrial deposits (Figure 7). Lolekaa soils are described as follows:

> This series consists of well-drained soils on fans and terraces on the windward side of O‘ahu. These soils developed in old gravelly colluvium and alluvium. They are gently sloping to very steep. Elevations range from sea level to 500 feet. The annual rainfall amounts to 70 to 90 inches and is well distributed throughout the year. The mean annual soil temperature is 71 degrees F. Lolekaa soils are geographically associated with Alaeloa and Waikane soils [Foote et al. 1972:83]

A second soil series, Mokuleia loam, is indicated along the northern edge of the project area and is associated with marine or Jaucus sand. Mokuleia loam is described as follows:

> This series consists of well-drained soils long the coastal plains on the islands of Oahu and Kauai. These soils formed in recent alluvium deposited over coral sand. They are shallow and nearly level. Elevations range from nearly sea level to 100 feet. The annual rainfall amounts to 15 to 40 inches on Oahu. The mean annual soil temperature is 74 degrees F. Mokuleia soils are geographically associated with Hanalei, Jaucus, and Keeau soils. [Foote et al. 1972:95]

1.4.2 Built Environment

The entire project area is a built environment, as evidenced by the raised lawn feature associated with the Ka‘a‘awa Fire Station in the northern half and the current City & County of Honolulu radio communication tower and related structures densely concentrated in the southern half of the project area.

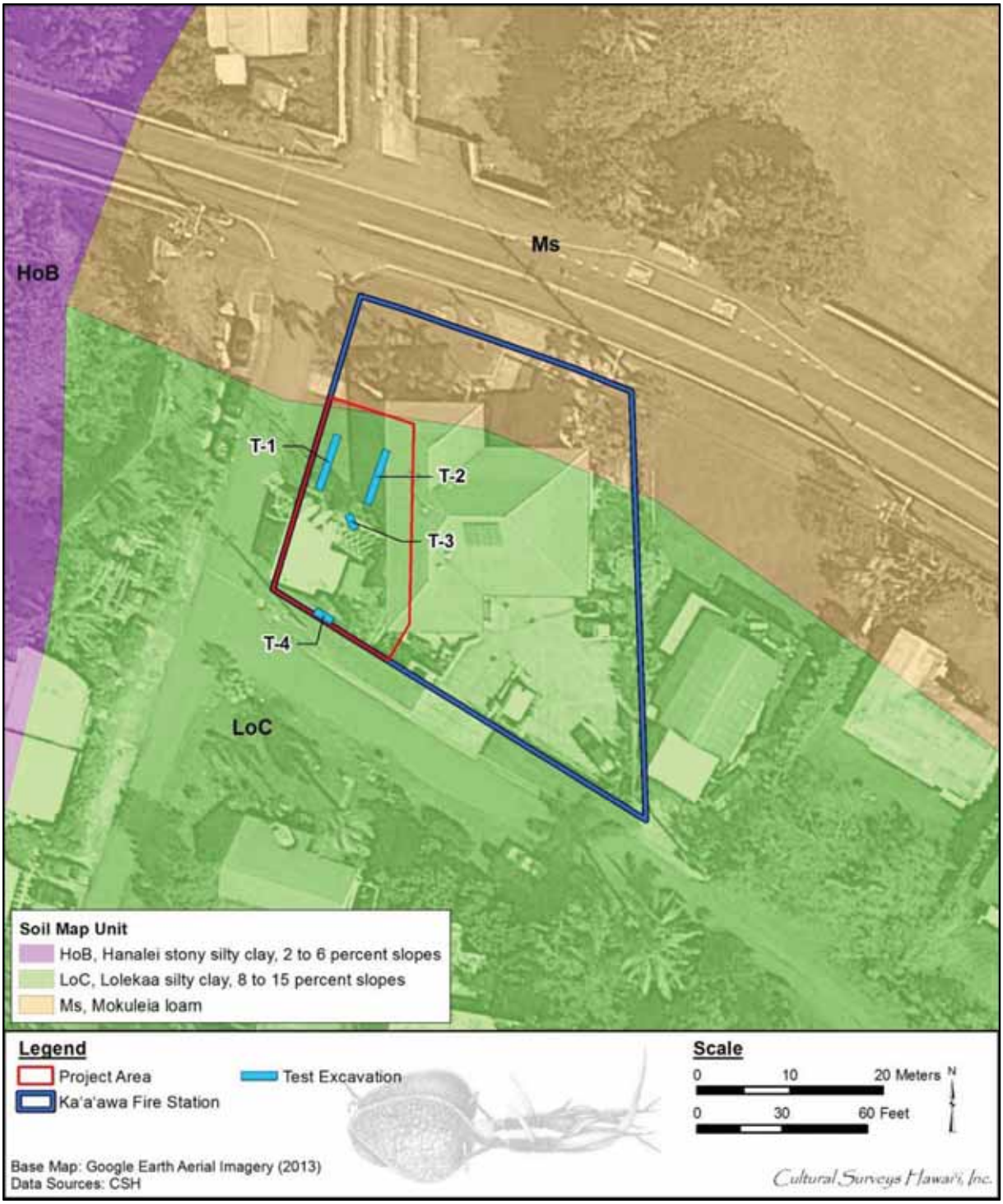


Figure 7. Overlay of *Soil Survey of the State of Hawaii* (Foote et al. 1972), indicating soil types within and surrounding the project area (U.S. Department of Agriculture Soils Survey Geographic Database [SSURGO] 2001)

Section 2 Methods

2.1 Field Methods

CSH completed the fieldwork component of the project under archaeological fieldwork permit number 16-26, issued by the SHPD pursuant to HAR §13-13-282. Fieldwork was accomplished on 31 March and 1 April 2016 by Project Director Michelle Pammer, B.A., Jennifer Robins, B.A., and Karl Van Ryzin, B.A. under the general supervision of Hallett H. Hammatt, Ph.D., Principal Investigator, and Project Manager Douglas Borthwick. This work required approximately 9 person-days to complete. Fieldwork included 100% pedestrian inspection of the project area, GPS data collection, and subsurface testing.

2.1.1 Pedestrian Survey

A 100%-coverage pedestrian inspection of the project area was undertaken for the purpose of historic property identification and documentation. As there were no surface historic properties, historic property identification efforts focused on the identification of subsurface cultural deposits.

2.1.2 Subsurface Testing

On 16 June 2015, David Shideler, CSH Project Manager, consulted with Dr. Susan Lebo, Archaeology Branch Chief for the State Historic Preservation Division (SHPD), on the subsurface testing strategy of the proposed project. A proposed AIS test excavations schema was presented for a total of four test trenches to be excavated within the project area: two trenches in the footprint of the 120-ft communication tower (Trench T-1 and T-2) and two trenches partly overlapping the fenced area in the southeast portion of the project area.

Upon uncovering a utility line in T-3, the excavation was abandoned and the decision was made—based on the apparent subsurface hazards and density of facility infrastructure—not to excavate inside the fenced area. As a result, the remaining T-4 excavation was reduced in size and shifted to the west, outside the fenced area. This modification of the testing strategy was approved during consultation between David Shideler and Dr. Susan Lebo on 6 April 2016.

The subsurface testing program was backhoe assisted and, as specified above, involved three test excavations and one partial excavation. The linear trenches measured between 2 m and 6 m long and 0.65 to 0.75 m wide. If feasible, the trenches were excavated around subsurface utilities.

A stratigraphic profile of each test excavation was drawn and photographed. The observed sediments were described using standard USDA soil description observations/terminology. Sediment descriptions included Munsell color; texture; consistence; structure; plasticity; cementation; origin of sediments; descriptions of any inclusions, such as cultural material and/or roots; lower boundary distinctiveness and topography; and other general observations. Stratigraphic anomalies were exposed and carefully represented on test excavation profile maps.

Sediment samples of intact strata were collected from three of the four trenches.

2.2 Laboratory Methods

Three collected sediment samples were wet-screened for content and catalogued by CSH archaeological staff at the CSH laboratory facilities on O‘ahu. The analysis was undertaken using standard archaeological laboratory techniques.

2.2.1 Sediment Sample Analysis

The sediment samples collected from intact alluvium (Stratum II) were examined within the CSH laboratory to aid in characterizing the cultural content (if present) and chronology of these deposits. The samples were collected as bulk samples and labeled with provenience information. The volume of each sample was recorded so that comparisons could be made between samples. The bulk samples were wet screened in the lab through 1/16-inch wire mesh.

2.2.2 Research Methods

Background research included a review of previous archaeological studies on file at the SHPD; review of documents at Hamilton Library of the University of Hawai‘i, the Hawai‘i State Archives, the Mission Houses Museum Library, the Hawai‘i Public Library, and the Bishop Museum Archives; study of historic photographs at the Hawai‘i State Archives and the Bishop Museum Archives; and study of historic maps at the Survey Office of the Department of Land and Natural Resources. Historic maps and photographs from the CSH library were also consulted. In addition, Māhele records were examined from the Waihona ‘Aina database (Waihona ‘Aina 2000).

This research provided the environmental, cultural, historic, and archaeological background for the project area. The sources studied were used to formulate a predictive model regarding the expected types and locations of historic properties in the project area.

Section 3 Background Research

3.1 Traditional and Historical Background

The project area is situated in Ka‘a‘awa Ahupua‘a, a traditional land division representing the southeastern most *ahupua‘a* in the Ko‘olauloa District. The project area lies in the northern end of the *ahupua‘a*, just inland of Pūlā‘ī Point, also called Ka‘a‘awa Point.

3.1.1 Traditional Accounts

The western coastal boundary point of Ka‘a‘awa Ahupua‘a is Pu‘u Māhie Point. Pu‘u Māhie, which translates to “pleasant hill,” divides Ka‘a‘awa from the neighboring *ahupua‘a* (traditional land division), Kahana. Ka‘a‘awa extends southeast from Pu‘u Māhie to Kalaeoka‘ō‘io Point, which not only marks the division between Ka‘a‘awa and Kualoa Ahupua‘a, but also between the *moku* (districts) of Ko‘olauloa to the north and Ko‘olaupoko to the south. One interpretation for the name of Kalaeoka‘ō‘io Point (also called Ka‘ō‘io Point) is “the Cape of the ‘ō‘io.” The *‘ō‘io* (bonefish: Albula vulpes) travel in schools and are caught in nets. Furthermore, the Hawaiian saying *ka lae holo a i‘a o Ka‘ō‘io*, meaning “the point of Ka‘ō‘io where one must swim as a fish does” (Hawaiian Ethnological Notes n.d.:1:261) is probably a reference to the current at Ka‘ō‘io Point.

Many of the place names in Ka‘a‘awa emphasize the importance of fishing and ocean resources (Table 1, Figure 8). Makahonu Point (also called Kalaeokuonopua‘a) in Ka‘a‘awa means “eye of the turtle” and refers to a time when Kaiaka (“shadowy sea”) Bay was a nesting and feeding ground for turtles. Ka‘a‘awa literally means “the yellow wrasse” (*Bodianus bilunulatus*), a common reef fish off Pūlā‘ī Point, also called Ka‘a‘awa Point. The *‘a‘awa* (wrasse fishes) were considered an *‘aumakua* (guardian spirit) by some Hawaiian families (Clark 1977:158–159; Pukui and Elbert 1986:3). However, Handy and Handy interpret the name Ka‘a‘awa differently:

> The name doubtless refers to the ‘passage’ through the reef formed by the stream which empties through two channels some distance apart. There is a narrow beach and broad lagoon, not very well protected because the passage (awa) through the reef is so broad. [Handy and Handy 1972:444]

Makaua, the section of land at the northwestern end of Ka‘a‘awa and about 140 m west of the project area, was once considered a separate *ahupua‘a*, but came to be regarded as a part of Ka‘a‘awa. It features in the legend of the hero Kawelo (*Ku‘oko‘a* 12 March 1908), who is taught the art of fishing by a man named Ma‘akuakeke. One day their canoe passes the *pali* (cliff) of Kānehoalani, the land of Kualoa, the island of Mokoli‘i, and then reaches Makaua, which is described as “*kahi kēia o ka ipu kai momona*,” “a land of fat, bountiful sea lands.” Kawelo eventually succeeds in catching the miraculous fish Uhu‘māka‘ika‘i in a net.

Uhu‘māka‘ika‘i was an *uhu* (parrotfish) caught by Puniakai‘a, a man from Kāne‘ohe. Puniakai‘a raised the fish as a pet; when it was grown, he set it free into the ocean. This fish became the parent of all fish, *ka ‘āhel o na i‘a a pau loa*. One day the people gathered from Makapu‘u Point to Ka‘ō‘io Point in Ka‘a‘awa. Puniakai‘a called out to Uhu‘māka‘ika‘i:

Table 1. Place Names of Ka‘a‘awa Ahupua‘a

Place Name	Type	Meaning*	Comments
Kauhi-ke-i-maka-o-ka-lani (Crouching Lion)	Stone formation	Kauhi the great eye of heaven	
Ka‘ahu‘ula	Spring	The feather cloak	Spring in Kualoa said to be entrance to the legendary cave Kānehoalani
Ka‘a‘awa	*Ahupua‘a*, beach, coastal point, stream	The yellow wrasse (Pukui et al. 1974); turning passage (Handy and Handy 1972:444)	
Kaiaka	Bay	Shadowy sea	
Kalaeoka‘ō‘io; Ka ‘Ōio; ‘Ō‘io	Coastal point	The cape of the *‘ō‘io* (bonefish), or the point of the night marchers	
Kalae‘ō‘io	Beach	Same as above	Named for the nearby Kalaeoka‘ō‘io Point
Kalaeo-kuonopua‘a	Coastal point	Unknown derivation (*ka lae*=cape; *kūono*=bay; *pua‘a*=pig or cloud bank?)	Also called Makahonu Point
Kānehoalani	Ridge; *pu‘u*; cave (Pohukaina)	Kāne royal companion	Boundary point between Ka‘a‘awa and Kualoa Ahupua‘a
Kanenelu	Beach	The marsh	At Kalaeoka‘ō‘io Point
Kuloa	Coastal point	Long back or ridge	Modern name; mispronunciation of Kualoa (the neighboring *ahupua‘a*)
Makahonu	Coastal point	Eye of the turtle	Also called Kalaeokuonopua‘a
Makaua	*Ahupua‘a*; stream, channel	Eye of the rain (Clark 1977); unfriendly (Pukui et al. 1974)	Often now combined with Ka‘a‘awa
Pauhukaina	Spring		Inland of Kalaeoka‘ō‘io
Pohukaina	Cave		One entrance believed to be near the boundary point between Ka‘a‘awa and Kualoa Ahupua‘a

Pūhala	Coastal area	Pandanus tree	Name of cottage owned by Mrs. F.M. Swanzy
Pūlā‘ī	Coastal point	Name of a legendary person (Clark 2002:309)	Eastern boundary for Makaua; in modern times called Ka‘a‘awa Point
Pu‘u Māhie (Mahia)	Coastal point	Pleasant hill	Western boundary for Makaua

*All place name meanings are from Pukui et al. 1974 or Clark 1977, unless otherwise noted

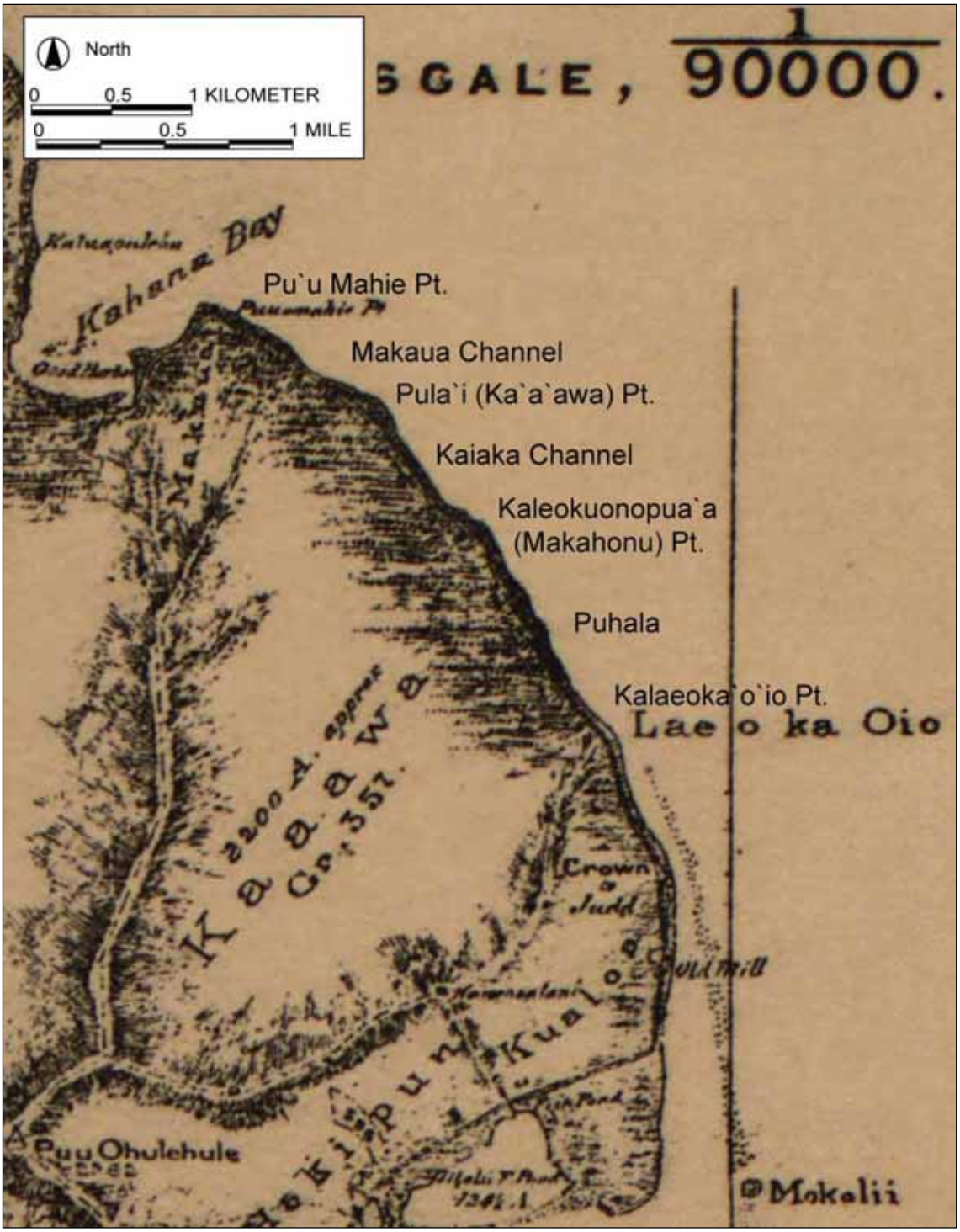


Figure 8. Portion of 1881 Hawaii Government Survey map of O‘ahu by R. Covington with place names added (Covington 1881)

Ē Uhumāka‘ika‘i

Come here, come here

Come, come here, Come, come here

Here I am, Puniakai‘a,

Bring all of the fish,

The stench will rise on the beach,

The pigs will eat some and leave some,

The dogs will eat some and waste some.

Uhu‘māka‘ika‘i called all of the fish and they swam up to the shore where the people gathered them up, salted some, gave some away, and still had enough left over to feed the pigs and the dogs (Manu 1992:55).

3.1.2 Chants and Stories of the Hawaiian Chiefs

The *ahupua‘a* of Ka‘a‘awa is mentioned in several legends concerning high chiefs of O‘ahu including ‘Olopana and his interactions with Kamapua‘a, the Hawaiian pig-god, and the later high chief, Kūali‘i.

‘Olopana was the high chief of O‘ahu who ruled around AD 1340-1360 (Cordy 2002:19). He had decreed that a woman named Hina should be reserved for him, but his brother Kahiki‘ula slept with her first and fell in love with her. In anger, ‘Olopana drove them away:

> Kahiki‘ula and his *wahine* [woman; Hina], along with his mother-in-law, were thrown out. Kahiki‘ula folks traveled on that very day until they reached Ka‘a‘awa. There they passed five days.
>
> They were later driven out and traveled to Kaluanui, where they made their home. At this place, Hina gave birth to their son, the Hawaiian pig-god, Kamapua‘a. [Kame’eleihiwa 1996:13–14]

The winds of O‘ahu, including the *ahupua‘a* of Ka‘a‘awa, are mentioned in a chant by the Hawaiian pig god, Kamapua‘a:

Kahana has the ‘Āhiu

Ka‘a‘awa and Kualoa have the Holopali

Kahalu‘u has the Pō‘aihale . . .

[Akana 2004:13]

The sea is also mentioned in the following chant for Kūali‘i, the high chief of O‘ahu ca. AD 1720-1740:

. . . *He kai oha I ke Kualoa*,	The sea that calls is at Kualoa,
He kai aai ko Ka‘a‘awa,	The sea that wears away is at Ka‘a‘awa,
He kai ahiu ko Kahana. . . .	The wild sea is at Kahana. [Fornander 1917:4(2):378]

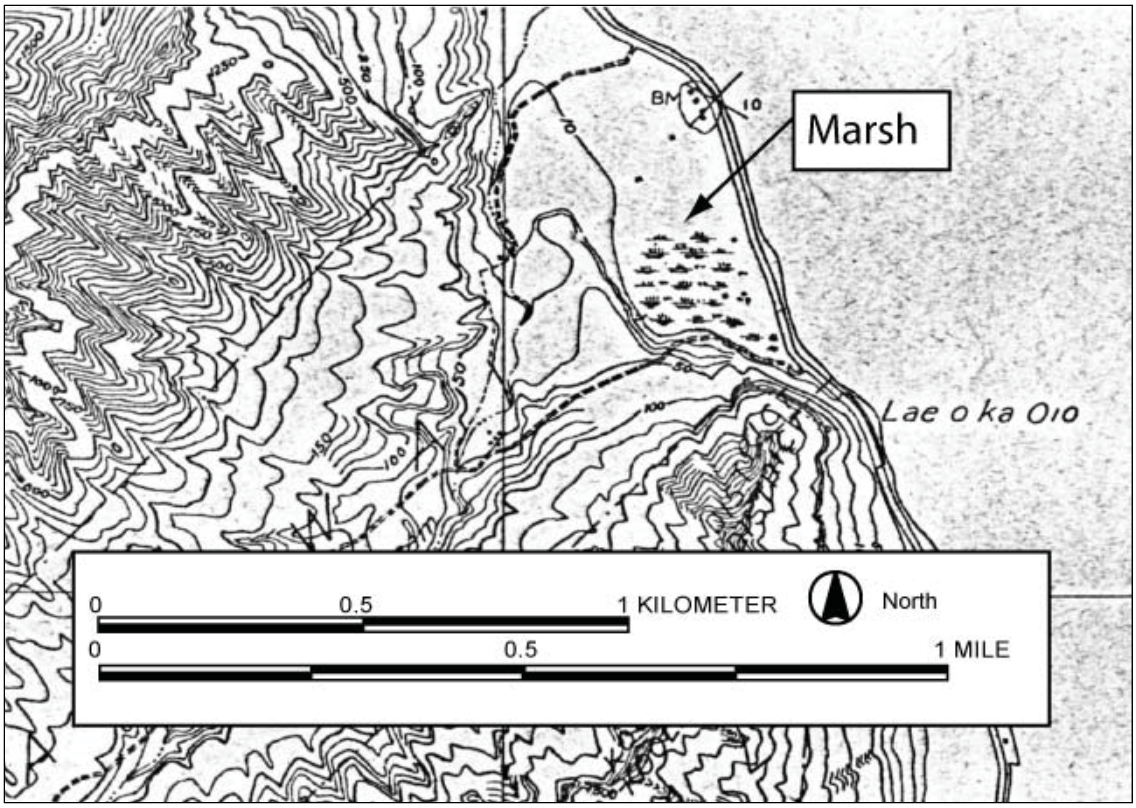


Figure 9. Portion of 1928/1930 Waikane USGS topographic quadrangle, showing large marsh area at eastern end of Ka‘a‘awa Ahupua‘a

The suggestion that the sea at Ka‘a‘awa erodes the shoreline (Figure 9) is reflected in one Hawaiian proverb, while a second proverb indicates a second association with the king Kūali‘i:

> He kai ‘a‘ai ko Ka‘a‘awa.
>
> *Ka‘a‘awa has a sea that wears away the land.*
>
> [Pukui 1983 #652]
>
> He moe kai no Ka‘a‘awa.
>
> *A sleeper in the sea of Ka‘a‘awa.*
>
> Applied to a lawbreaker who was to be put to death. When Kuali‘i was ruler of O‘ahu, he punished lawbreakers by drowning them in the sea of Ka‘a‘awa.
>
> [Pukui 1983 #821]

One additional story that concerns the chief Kuali‘i is the story of a boy who lived at Ka‘ō‘io (Kalaeoka‘ō‘io Point) in Ka‘a‘awa. Fornander (1917:4(2):428–431) gives just a brief reference. Kūali‘i is a quick, long distance runner and starts running counterclockwise around O‘ahu Island from Kailua. A certain unnamed boy who lived at Ka‘ō‘io Point with his grandmother sees him. The youth runs as fast as Kūali‘i and runs after him as far as Waimea.

> *Ia manawa, ukali pu aku la ua keiki nei; ke holo la o Kualii, a hala o Kaaawa, a ae iluna o na Makaua, a ka hoopiina aku e nana aku ai ia Kahana. I alawa iho auanei ka hana o Kualii, e pili ana keia keiki mahope o ia nei.*
>
> The boy then followed. Kualii kept on running and passed Ka‘a‘awa, then along and over Makaua and as he was going up the rise from which place you can see Kahana, Kualii looked behind and saw a boy following him. [Fornander 1917:4(2):428–429]

The youth shows proper deference and bravery, winning royal recognition and reward for his faithful service. After fighting together at central O‘ahu in the battle of Kūkaniloko, they returned to Ka‘ō‘io Point**.** Kūali‘i asked his servant for his *malo* (loincloth) and "gave it to the boy to be his own, and he fastened it to the boy with his own hands." ("*Hoahume* [*sic. Ho‘ohume*] *pono aku la no o Kūali‘i ka malo I ke keiki*").

3.1.2.1 Pele and Hi‘iaka

This section of the coast has several associations with Pele, the Hawaiian volcano goddess, and her family. The mountain ridge Kānehoalani, which means "Kāne royal companion" is named after Pele's father (Fornander 1919:5(2):524; Pukui et al. 1974:91). Another stone form, placed at either the Kualoa/Ka‘a‘awa border (according to Emerson 1978) or the Makaua/Kahana border (according to a series of articles in the Hawaiian language newspaper *Ka Na‘i Aupuni*), was a kinsman of Pele and her sister Hi‘iaka.

In her journey around O‘ahu, Hi‘iaka came to Kahana and discerned a figure in the cliff-face. She recognized it as a relative of hers, Kauhi-ke-‘ī-ka-maka-o-ka-lani, who came with Pele's followers when she traveled from the homeland of Kahiki to her new home in the Hawaiian Islands. Kauhi stayed in O‘ahu as the rest of the group traveled to the other islands. Hi‘iaka chants to the face, which she can see hidden behind a fringe of *ti* and *kukui*.

O Kauhi ke I maka o ka lani,	*Kauhi, thou watch-tower of heaven,*
O ka pali keke‘e o halawa-lawa—. . .	*Ensconced in the zigzag fluted wall—*
O Kauhi, ka halu‘a-pua, maka ā-lani—	*Thy body lies smothered in ferns;*
O ka maka o ke akua, . . .	*Thine eye shines on high like a star . . .*
He akua ia la, aohe ike mai;	*He's surely a god; yet hears he not;*
O kana luahi nui no ka maka,	*Fierceness gleams from his eye.*
Ke ala nei; – E ala;	*Now he looks, now turns—and to me!*
E ala, e ala mai ana, e!	*Awake, thou explorer of heaven!*
E ala e, Hi-ka‘a-lani!	*Awake, thou sender of Winter's rain!*
E ala, e ka Hooilo ua I ka lani!	*The spouse, Ma-ū, of Winter is night;*
E ala e, Maū, wahine a Maka‘li‘i;	*The time of arising has come!*
E ala, e! [Emerson 1978:92–93]	

The chant awoke in Kauhi the desire to travel with Hi‘iaka, to finally see the other islands. Although Hi‘iaka is sympathetic, she refuses to grant his wish to accompany her.

> Kauhi was indignant at this evasive dismissal of his entreaty. The thought that Hiiaka should countenance his perpetual imprisonment in the bleak cliff filled him with rage. With a mighty effort he lifted himself and tore away the cover of tree-roots, earth and rocks that embraced him until he came to a crouching position. That was the limit of his power: he could do no more. A stony form in the mountain wall of Kahana, resembling the shape of a man on all-fours, remains to vouch for the truth of this legend. [Emerson 1978:96]

In a second version of the story, Hi‘iaka also seems to place the rock form at Kalaeoka‘ō‘io Point (Ka‘a‘awa/Kualoa border), but identified the form as a crouching dog (*‘īlio*), rather than a man.

> *‘O kēlā ‘o Kauhi-ke‘ī ka-maka-o-ka-Lani. ‘O ka ‘īlio-ha [hae?] kēia a Kāne I lawe mai ai mai Kahiki mai, a ‘o kona wahi e ‘ike mau ia nei ‘o ka lae a‘e nei o ka ‘Ō‘io, ‘o Pu‘u-uhi . . .*
>
> That is Kauhi ke ‘ī ka maka o ka lani. That is the [fierce] dog brought by Kāne from Kahiki and the places where it was seen were the nearby point of Ka ‘ō‘io, and Pu‘u Uhi. . . . [*Ka Na‘i Aupuni*, 28 January 1906, translated in Sterling and Summers 1978:174].

Within the same version of the story, Hi‘iaka seems to place the stone form at Makaua. When she refuses to grant Kauhi’s wish, she entreats Kauhi to

> Stay beside the sea Makaua and enjoy the pelting of Ma‘akua. Bear with patience the cold dew of the dark cliffs . . . [*Ka Na‘i Aupuni,* 29 January 1906, translated in Sterling and Summers 1978:174]

The author of this version concludes,

> O Reader, if you are a stranger to the cliffs of Ko‘olau and are visiting in that region, go on till you pass Ka-oio point, set foot on the sandy stretch of Ka‘a‘awa and go along and enjoy the famous valley of Kahana and at the next low cliff before you, look up at the ridge and see the big rock. The rock looks like a crouching lion with head raised. That is it. It is called by some of the tourists who visit the island, the sleeping lion. [*Ka Na‘i Aupuni,* 29 January 1906, translated in Sterling and Summers 1978:174]

Today the rock formation, at the cliff on the Makaua/Kahana border is called the “Crouching Lion,” as is the restaurant built at the foot of the ridge. Figure 10 shows this rock formation.

3.1.3 Night Marchers, Kalaeoka‘ō‘io, and Pohukaina Cave

In Section 2.1.1, the name Kalaeoka‘ō‘io Point was interpreted as the “cape of the bonefish (*‘ō‘io*).” However, the name can also be interpreted as the “cape of the ghost procession (*‘o‘io*).” Handy and Handy (1972:450) take a minority position in understanding the name of this eastern point of Ka‘a‘awa as Lae-o-ka ‘o‘io (without a long vowel on the first ō). Thus, Handy and Handy understand the name of the point as “point (lae) of the Night-Marchers (*‘oi‘o*).” Pukui and Elbert

Figure 10. *Kauhi* (*Kauhi ke ‘ī ka maka o ka lani*) formation, now called “Crouching Lion”

(1986:258) define *‘o‘io* as the procession of ghosts of a departed chief and his company, more commonly called *huaka‘i pō*.

Kalaeoka‘ō‘io marks the coastal boundary point between the districts of Ko‘olaupoko and Ko‘olauloa. This division point is also said to have marked one of the entrances to the legendary cave, Pohokaina (Pohukaina, Pahukaina). The Hawaiian scholar, Samuel Kamakau wrote,

> There is only one famous hiding cave, ana huna, on Oahu. It is Pohukaina. The opening on Kalaeoka‘o‘io that faces toward Ka‘a‘awa is believed to be in the pali of Kanehoalani, between Kualoa and Ka‘a‘awa, and the second opening is at the spring Ka‘ahu‘ula-punawai. This is a burial cave for chiefs, and much wealth was hidden away there with the chiefs of old. [Kamakau 1991:38]

The cave was named for a legendary chief, named Pahukaina, who was buried in the cave until his bones were later carried back to the island of Kaua‘i. One Hawaiian manuscript states,

> Kualoa is where Pahukaina lived; he died in Mahiki, Hawaii. But it was from there that his bones were brought to the cave of Kanehoalani. It is said the cave is at the Point of Oio [Ka‘ōi‘o], but no one has seen it. At the time Kamehameha III went to Koolau by way of Kualoa, he commenced to make inquiries about it. He searched for the noted cave but could not find it, but the people there told him to search for it through a spring that was called the Spring of the Ahu‘ula, for the reason that an ahu-ula [feather cloak] had once been found floating on the surface of the water there. They led the way there and searched for it, but could not find any way to the

> cave. [Queen Lili‘uokalini papers, Bernice Pauahi Bishop Museum, translated in Taylor 1930:37]

The presence of this burial cave is a tradition that emphasizes themes of dead chiefs and processions through darkness. It would be surprising if ghost traditions were not associated with this area, given that it is the location of perhaps the most fabulous burial cave in Polynesia. The association of this ghostly procession, now called “Night Marchers” is evident in this Hawaiian proverb concerning Kalaeoka‘ō‘io Point.

> *Moe pō‘o a hi‘u I Kalae‘o‘io.*
> Lies head and tail at Kalae‘o‘io.
> Is up to the neck in trouble. Processions of ghosts were sometimes encountered here. If one had a relative among them, he escaped death; if not, he perished .
> [Pukui 1983: #2177]

3.1.4 Early Historic Period

In 1795, after Kamehameha had consolidated his control over the Hawaiian Islands, he gave extensive portions of his conquered lands to some of his relatives and closest allies. The *ahupua‘a* of Ka‘a‘awa was given to Keaweaheulu, an uncle of Kamehameha and a high *ali‘i* of the island of Hawai‘i. This same chief died in 1804 at Ka‘a‘awa, where Kamehameha was amassing an armada to invade the island of Kaua‘i. An epidemic, called *mai ‘ōku‘o* (squatting sickness) decimated Kamehameha’s gathered forces and prompted him to abandon his invasion of Kaua‘i (Joesting 1984:62).

E.S. Craighill Handy described the remnants of the traditional Hawaiian settlement and agricultural patterns of Ka‘a‘awa Ahupua‘a in 1940.

> At the upper end of the [Ka‘a‘awa] valley, where cattle are now pastured, there are slopes and vales of boggy land which presumably were once planted to forest taro. There is no sign of terracing. Wild taro was found in the stream bed about 2.5 miles inland from the highway. . . . In a gulch on the north side of the valley, less than 2 miles up from the sea, an old coconut tree still stands, indicating the former existence of a *kuleana* home site. . . . About eight tenths of a mile inland the level land broadens out along the stream and there are large terraces where bananas and garden truck [vegetables] are now raised. Close to the sea and north of the main marsh, in the land formerly called Makaua, there are remains of old terraces covering a considerable area of the broad swampy lands between the highway and the mountains. [Handy 1940:93]

This description indicates house sites along the coast, irrigated taro lands along streams and marshy ground, and dryland taro plots near the forest edge. In the pre-Contact and early historic period, Hawaiians would still be living in their *pili* grass houses, as pictured in a ca. 1880 photograph of *pili* houses at Ka‘a‘awa (Figure 11). In the late nineteenth to early twentieth century, agricultural lands were replaced by cattle pastures, truck farms, and eventually large subdivisions.

3.1.5 Early to Mid-1800s

Island missionaries began taking population censuses in 1831. The combined population of Ka‘a‘awa and Makaua in the 1831-1832 census was 234 people; in the 1835-1836 census, the

Figure 11. Photograph of Hawaiian hale, possibly 1880s Ka`a`awa (North Shore Photography / Bill Romerhaus)

population is given as 81 in the *ahupua‘a* of Makaua and 203 in the ahupua‘a of Ka‘a‘awa, or 234 combined (Schmitt 1973:19, 24). The population of the entire district of Ko‘olauloa was 2,891 in 1831-1832 and 2,681 in 1835-1836. The population began to decline rapidly after this date, with 1,345 in the next census of 1853 and reaching a low of 1,082 people in 1878 (Schmitt 1977:12–13). The primary reason for this decline was the introduction of western diseases. Between 1848 and 1853, a series of epidemics including measles, influenza, and whooping cough often wiped out entire villages. Another cause for population decline was the consolidation of people near missions or coastal ports, including the movement of large numbers of people to the new urban center of Honolulu.

3.1.6 Mid-1800s to the Māhele

The Organic Acts of 1845 and 1846 initiated the process of the Māhele—the division of Hawaiian lands—which introduced private property into Hawaiian society. In 1848, the crown and the *ali‘i* (chiefly class) received their land titles. The common people received their *kuleana* (individual parcels) in 1850.

A total of 39 claims, 23 of which were awarded, were made in the Ka‘a‘awa region in the Māhele of 1850 (Figure 12 and Appendix A). The majority of the Land Commission Award claims were along Ka‘a‘awa Stream and lands to the southeast at some distance from the present project area (Figure 13). Sixteen of these claims were immediately adjacent to the *ala nui* (government road), which later became Kamehameha Highway. This pattern suggests there was a focus of habitation well to the southeast of the present project area that was densely inhabited in the mid-nineteenth century and probably had been for centuries.

Figure 12. Map showing neighboring LCAs to the east of the project area (Google Earth 2013)

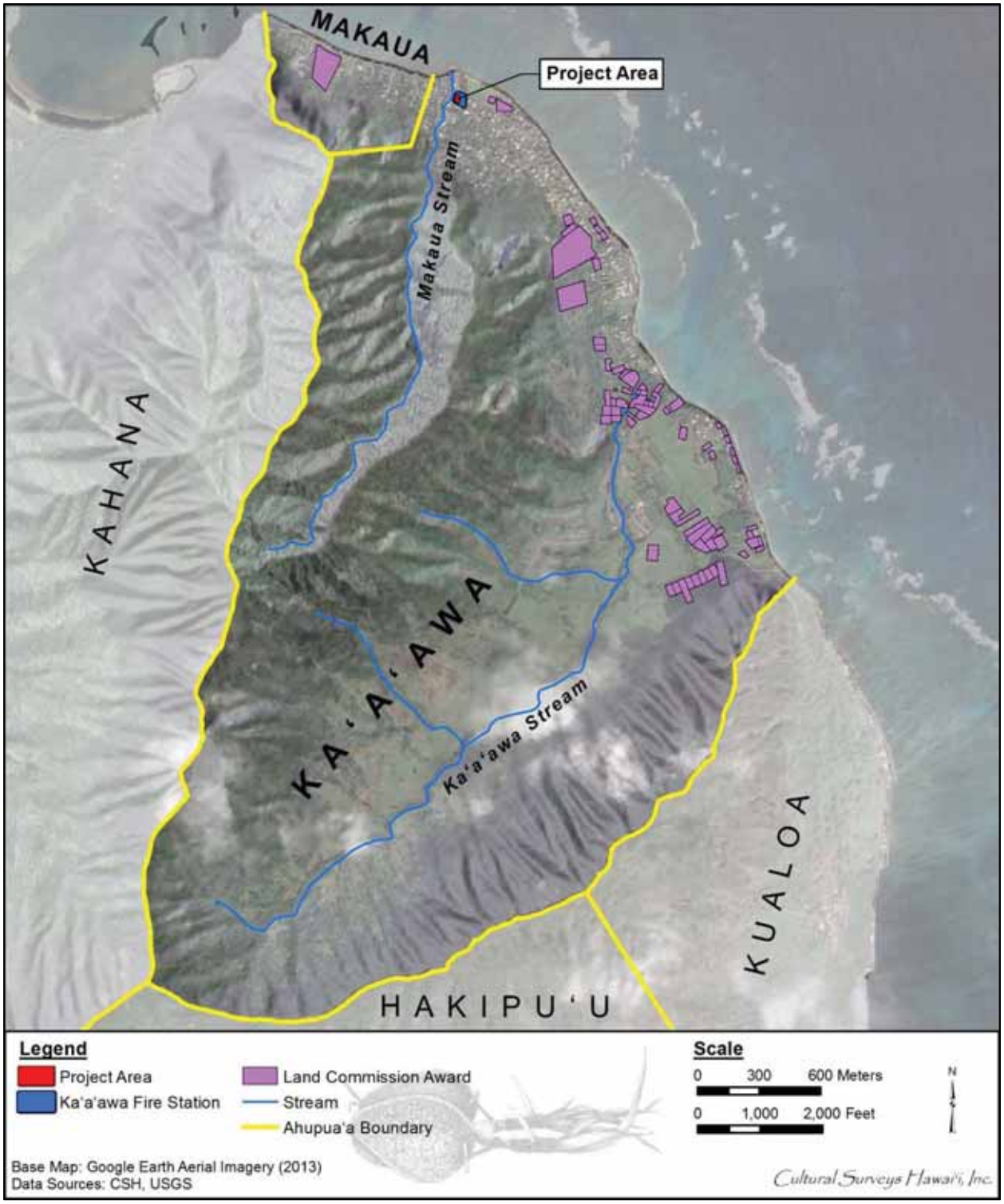


Figure 13. Map showing distribution of LCAs in Ka‘a‘awa and Makaua Ahupua‘a (Google Earth 2013)

Two parcels of one Land Commission Award (LCA 3954 to Newa) were, however, located on the coast, approximately 150 m to the east and *makai* of Kamehameha Highway (see Figure 12 and Appendix A). Newa claimed a western square house site (*pā hale*) parcel and an adjacent, larger, quadrangular pasture (*kula*) to the east. The bounding lands were described as under the jurisdiction of the *konohiki* (headman of the *ahupua‘a*). Newa also claimed a fishery "kai of Uki," and ponded field taro lands at a location unspecified.

3.1.7 Late 1800s to 1900s

Gerrit Parmele Judd was born at Paris Hill, New York on 23 April 1803. The Judds (Gerrit P. and his wife, Laura Fish) arrived in Hawai‘i with the Third Company of missionaries on 30 March 1828. The trip from Boston around Cape Horn had taken nearly five months (Pratt 1978:94). The Judds landed in Honolulu and initially stayed with Rev. Hiram Bingham and his wife until they settled into a place of their own. Dr. G.P. Judd served as a missionary doctor under the American Board of Commissioners for Foreign Missions from 1828 until 1842 when he resigned to serve in government office (Kuykendall 1968:I:210). Dr. Judd was influential in the shaping and formation of land policies during the pre-Māhele period. In November 1850, only four months after the Act was passed, Kauikeaouli (Kamehameha III) sold the lands of Kualoa 1 and Kualoa 2 to Gerrit P. Judd and much of Kualoa remains in the hands of the heirs of G.P. Judd to this day.

An account of several land transactions was published in *Fragments V: Family Records* (House of Judd 1930:83–83) and is given below verbatim with a subsequent clarification.

> Six years later, on December 19, 1870, S.G. Wilder deeded to Gerrit P. Judd for $15,042.66 the lands of Kualoa, Ka‘a‘awa and Hakipu‘u. As Mr. George R. Carter has expressed it, ‘It was not until December of 1870 that he (Wilder) gave up the struggle and advertised the Wilder Plantation at Ko‘olaupoko for sale subject to a mortgage of $12,500.00. At this sale Dr. Judd appeared to be the only bidder and bought back the place for the amount of his mortgage with the interest due and one dollar.’
>
> From then on these lands were owned by Dr. Judd and on his death were entailed through Charles H. Judd to his children. They became the lands of Kualoa Ranch Ltd., on May 31, 1927. [House of Judd 1930:83–83]

An account published in an 1865 newspaper provides our best description of the plantation at its peak:

> . . . we come to the Kualoa estate of Messrs. Judd & Wilder, now called the ‘Oahu Plantation.’ Including Ka‘a‘awa, it consists of about four thousand acres . . . [we now see] a beautiful field of cane growing, about two hundred acres in extent, with extensive mill buildings erected and powerful machinery driven by steam. This change has all been made within the last fifteen months, and shows what industry and determination can accomplish, like much of the land on this side of Oahu, the cane fields here consist of rich bottom-land, lying just above the level of high tide. So near the surface is the water, that the roots of the cane find moisture all the year around, reducing the risk of drought very much. The soil like that of Lahaina, Waikapu and Wailuku receives its deposits of rich alluvium from the mountains in the rear. [*Pacific Commercial Advertiser* 18 February 1865]

Another article goes on to discuss the Ka‘a‘awa portion of the plantation.

> Ka‘a‘awa, the first valley beyond Kualoa, was formerly the property of C.G. Hopkins, Esq., but is now part of the ‘Oahu Plantation.’ It is a pretty little valley, of about 1200 acres, of which 300 or 400 acres are arable or grazing land, and the proprietors of the above plantation purpose to plant two hundred acres with cane during the present season. The mountains and ravines back of it are densely covered with hau, tutui, and pandanus trees, furnishing all the fuel required for the mill. [*Pacific Commercial Advertiser* 25 February 1865]

In 1879, a visitor to Kualoa Ranch traveled on west along the coast and noted,

> Some four miles further on at Ka‘a‘awa is the (Hon. Charles H Judd’s) dairy farm, and here are to be seen a herd of cattle of pure Durham breed. . . . five or six hundred head on the property and horse stock bred from celebrated sires (Kentucky blood) with a hundred head of horses and mares. [Hawaiian Directory, January 1881 in Scott 1968:742]

Figure 14 shows an 1880s photograph of the old Judd “Home Farm.” The toe of the ridge Pu‘u Kānehoalani can be seen in the center background.

3.1.8 Modern History

Few continuously operating public elementary schools in Hawai‘i pre-date Ka‘a‘awa Elementary School’s founding in 1904. The best known landmark at Ka‘a‘awa, the restaurant called Crouching Lion Inn (Figure 15), began as the private residence of George F. Larsen, Sr. who was in the construction business. In 1925, he bought a parcel of land in Makaua and built the house his family called “Hale Liona,” or “House of the Lion.” In 1937, the estate was sold to Reginald Faithful, president of the Honolulu Dairymen’s Association. In 1951, it was renamed the Crouching Lion Inn and was opened as a lodge and restaurant (Clark 1977:155–156).

Figure 16 through Figure 22 provide a succession of twentieth century maps and aerial photographs that show the project area and village of Ka‘a‘awa relatively vacant until the 1950s. One of the earliest roads shown near the project area (see Figure 17 and Figure 18) followed the current Huamalani Road to the upper reaches of Makaua Stream into the Waiohole Forest Reserve.

The first structure built in the project area appears to be a private residence that first appears on a 1954 USGS map (see Figure 19). The residential structure was subsequently converted for use as the Ka‘a‘awa Fire Station and replaced by the current station in the mid-1990s (Matsushita Sato Associates and Park 1995). During construction of the current fire station, the former dwelling and asphalt pavements were demolished and existing utilities (e.g., water, electric, and communications services) were cut and abandoned or left in place.

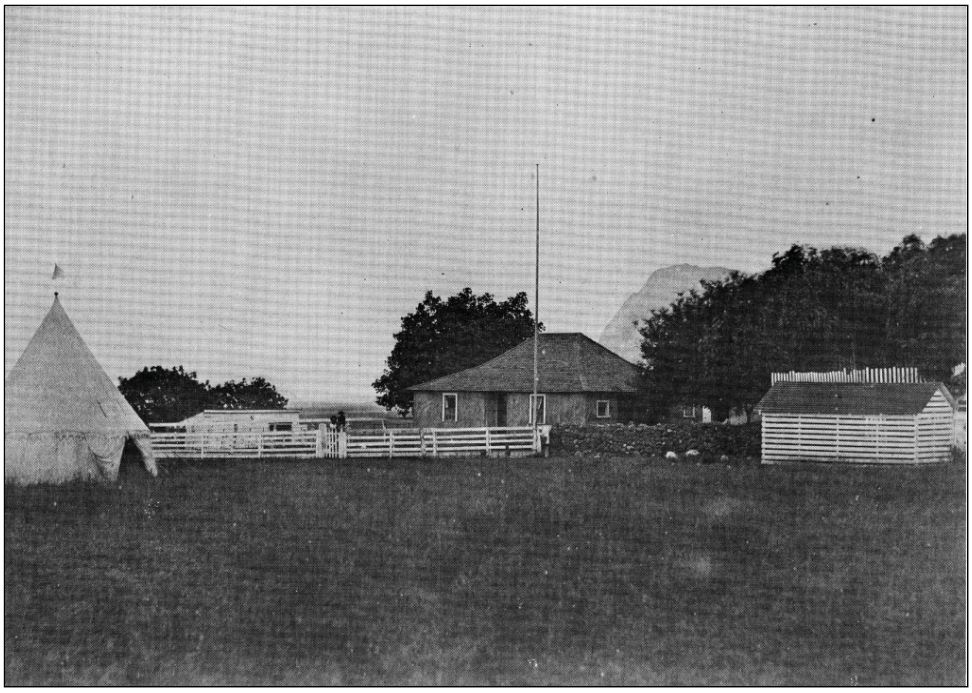


Figure 14. 1880s photograph of the Judd Home Farm in Ka‘a‘awa (photograph from Scott 1978:742)

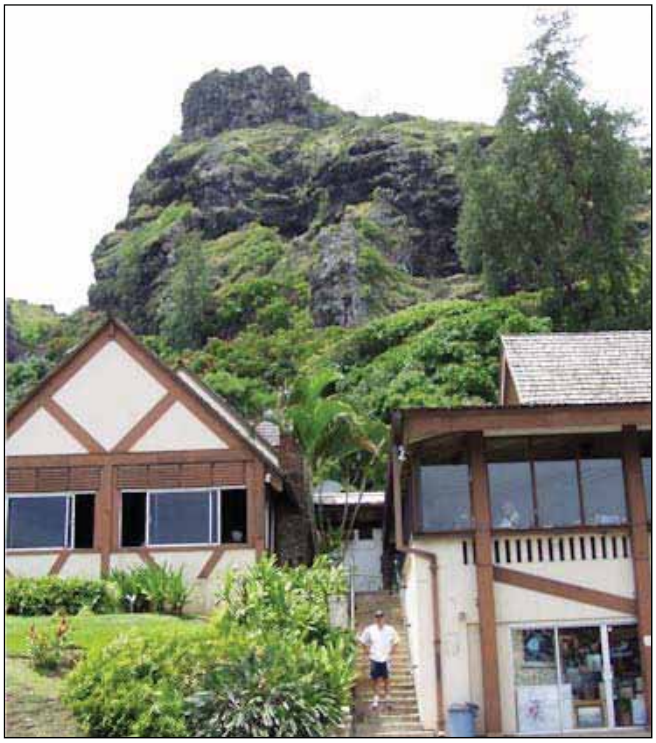


Figure 15. Crouching Lion Inn with Kauhi rock formation in background, present day

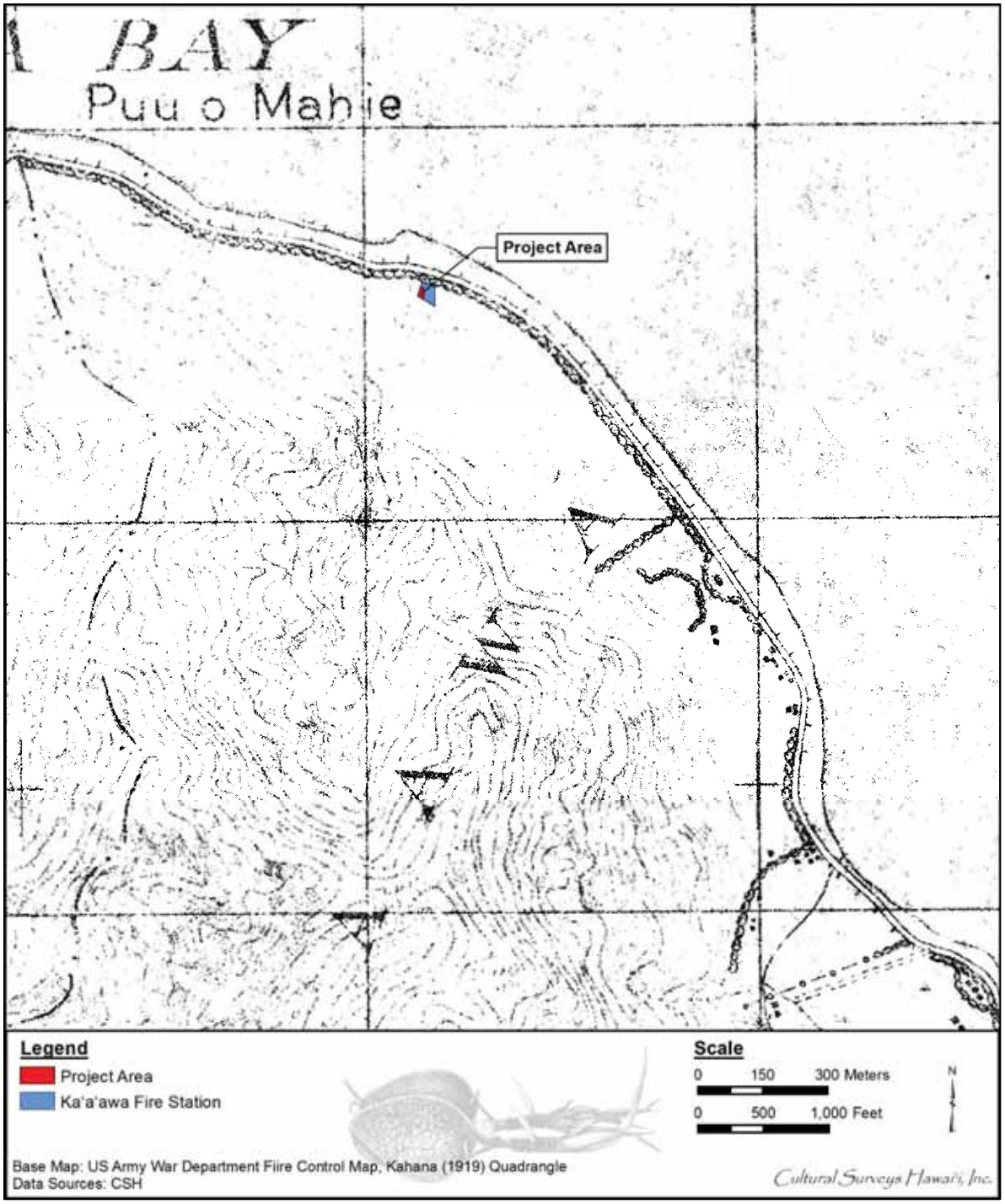


Figure 16. 1919 U.S. Army War Department fire control map, Kahana Quadrangle (portion) showing project area

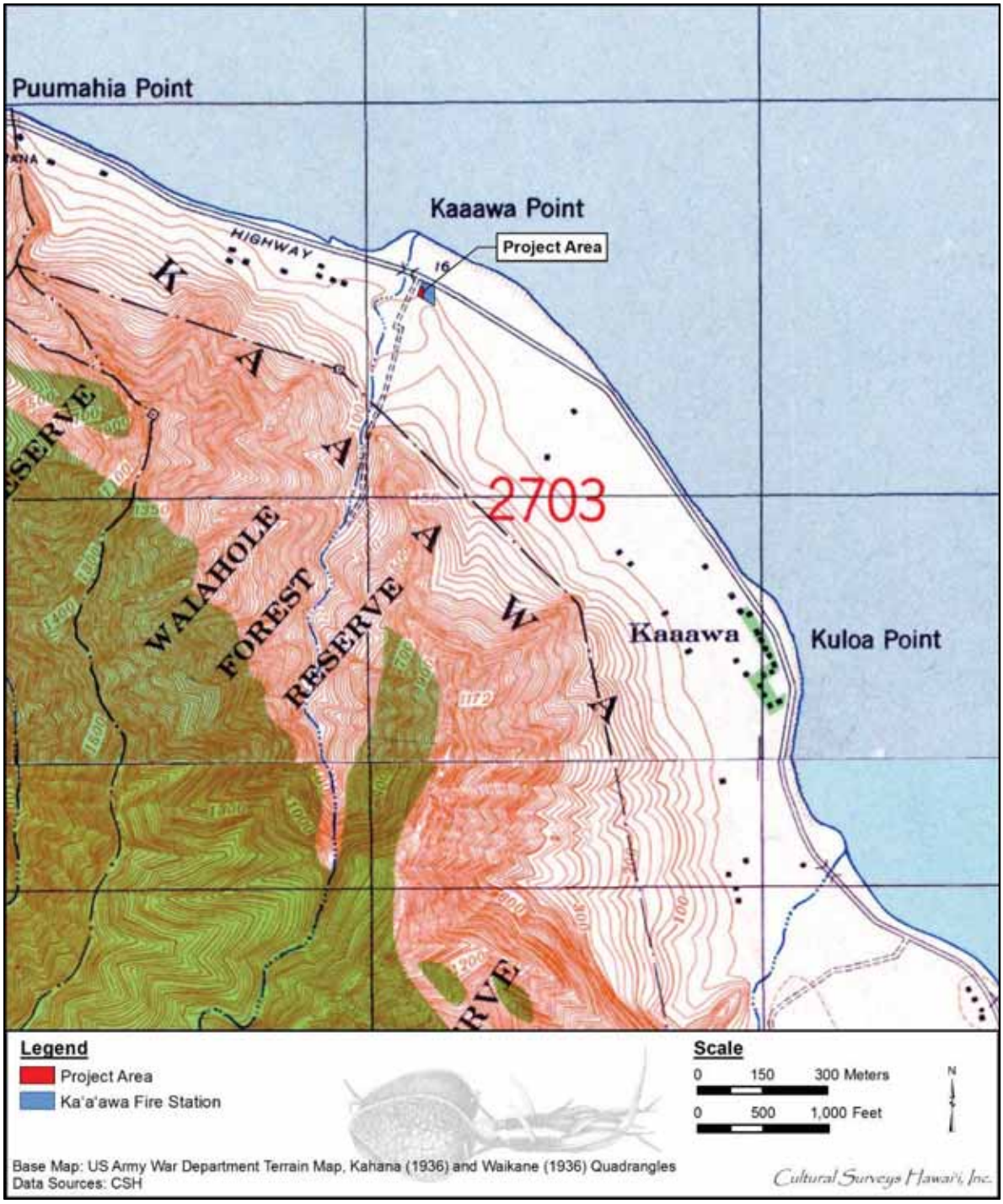


Figure 17. 1936 U.S. Army War Department terrain map, Kahana and Waikane quadrangles (portions) showing project area

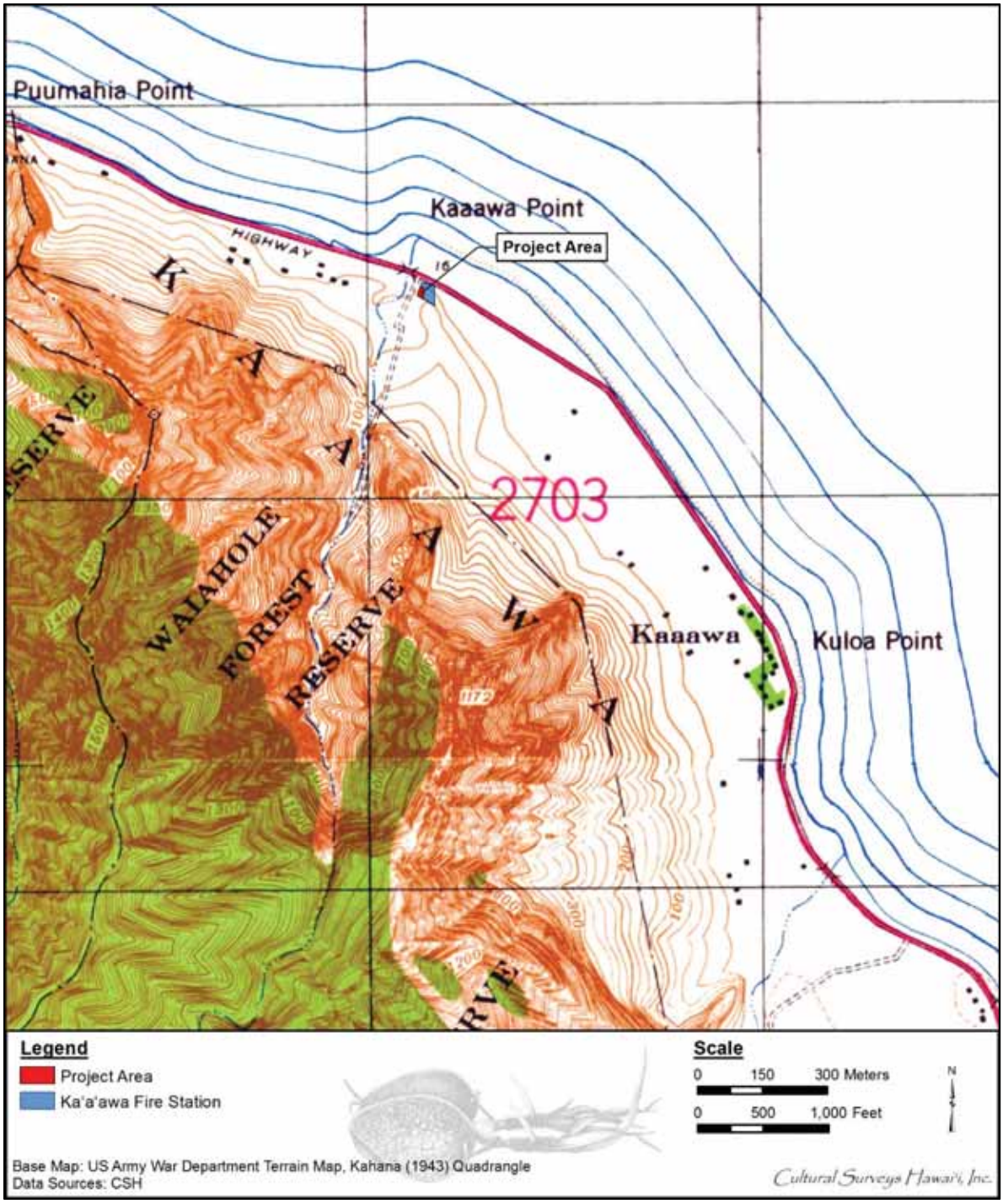


Figure 18. 1943 U.S. Army War Department terrain map, Kahana Quadrangle (portion) showing project area

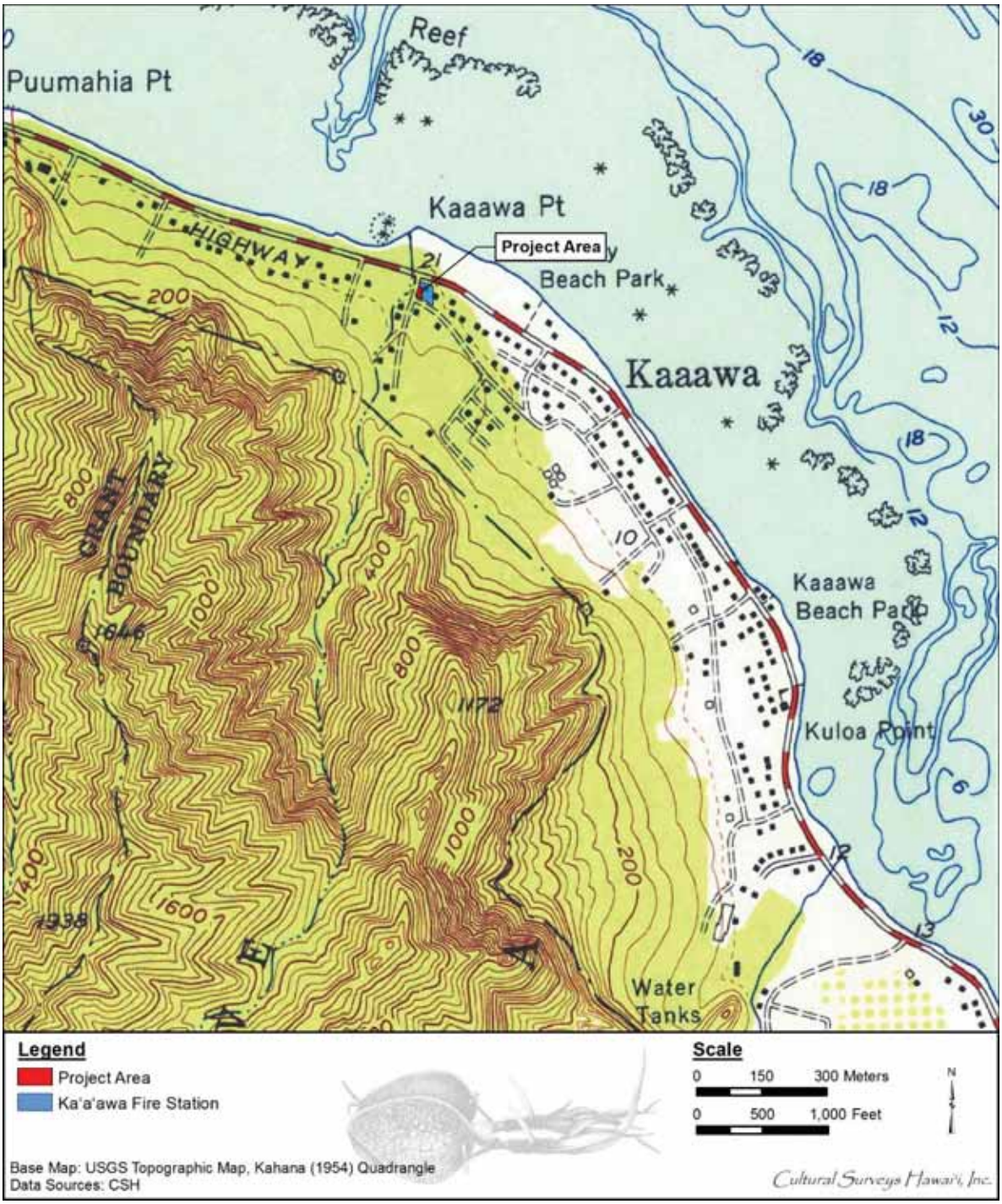


Figure 19. 1954 Kahana USGS topographic quadrangle (portion) showing project area

Figure 20. 1963 USDA Ka‘a‘awa Coast aerial photograph (UH MAGIS)

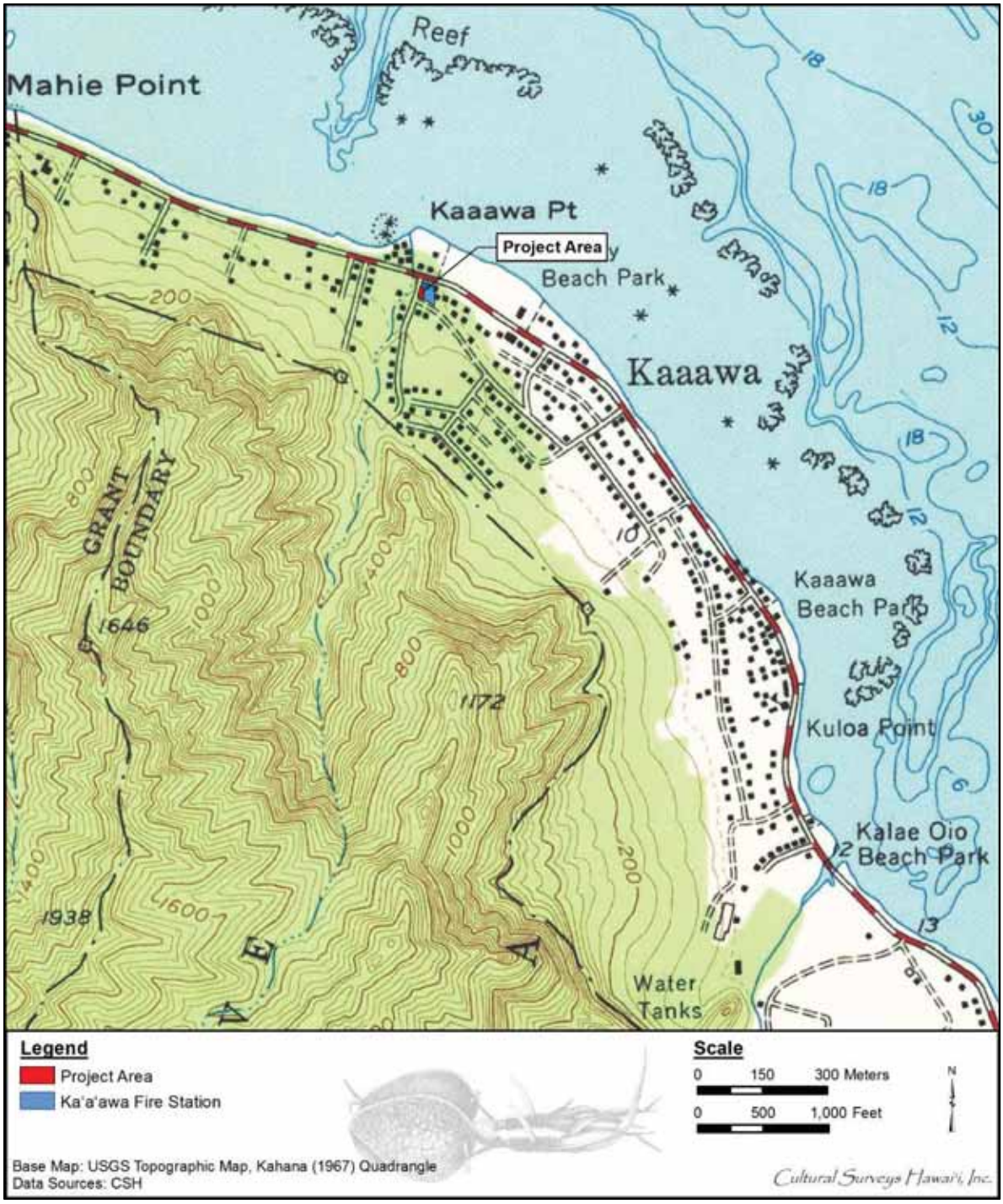


Figure 21. 1967 Kahana USGS topographic quadrangle (portion) showing project area

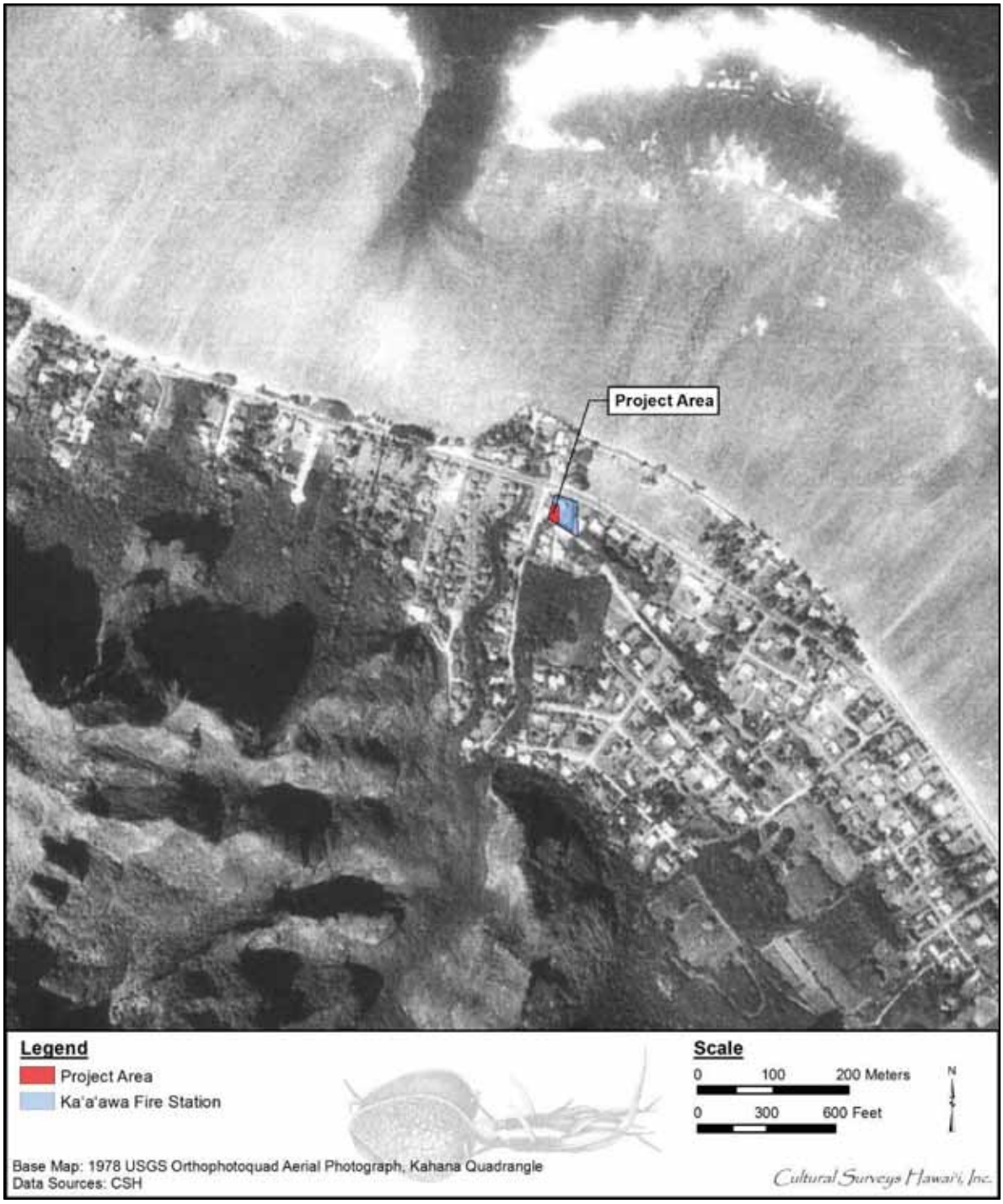


Figure 22.1978 USGS Orthophotoquad, Kahana quadrangle (portion) showing project area

Section 4 Previous Archaeological Research

Few large surveys have been conducted in Ka‘a‘awa and most archaeological investigations in the area have focused on individual structures and human burial sites. Early twentieth century findings by McAllister are presented in Section 4, followed by a discussion of more recent findings. A summary of previous archaeological investigations in the vicinity of the project area is presented in Table 2. The previous study areas and recorded sites are plotted on a modern USGS map (Figure 23 and Figure 24) and sites are described in Table 3. None of these studies was conducted within the current project area.

4.1 McAllister’s Survey of O‘ahu

In 1930, J. Gilbert McAllister of the Bishop Museum conducted an island-wide survey of O‘ahu, visiting the most prominent sites and gathering information from old residents on both physical and legendary sites. McAllister listed one site at the *ahupua‘a* boundary between Makaua and Kahana (Site 303), one site within Makaua Ahupua‘a (Site 304), two sites within Ka‘a‘awa Ahupua‘a (Sites 305 and 306), and one site at the *ahupua‘a* boundary between Ka‘a‘awa and Kualoa. Figure 24 shows the approximate location for these five sites, which were plotted by overlaying a map of the sites as plotted by McAllister (maps of pages 57 and 161) and a Sterling and Summers (1978) map that includes McAllister’s sites over a modern USGS map.

4.1.1 Site 303. Fishing Shrine/Crouching Lion at Makaua/Kahana Border

McAllister (1933:165) recorded Site 303 as “Palani fishing shrine (*ko‘a*), Pu‘u o Mahie ridge. It is a large stone, formerly a man, but changed by Hiiaka when she passed on her way to Kauai.” On a best-fit overlay map, McAllister’s plot for this site falls very near the rock formation labeled “Kāuhi” on the 1998 USGS map, on the western boundary of Ka‘a‘awa/Makaua. Kāuhi refers to the rock formation now called “Crouching Lion.” Thus, Site 303 may be referring to this rock formation, which according to legend was once Kauhi-ke-i-maka-i-ka-lani, a kinsman of the goddess Hi‘iaka.

However, in his Site 309 discussion, which supposedly refers to rock formations on Kānehoalani Ridge on the eastern boundary of Ka‘a‘awa, McAllister (1933:167) describes “. . . at Puu o Mahia, a lion stone, *Puu Liona* . . . Raphaelson (68, p. 33) [1929] believes the lion to be Kauhi; Emerson (32, p. 91) [1978] located Kauhi at Kaliuwaa Valley, though later (32, p. 96) he places it at Kahana.” McAllister thus seems to be uncertain on the location of the Kauhi rock formation and confused about the location of Pu‘u Māhie, which is on the western boundary of Ka‘a‘awa/Makaua, not on the eastern boundary.

It is also possible that more than one formation was referred to as a “lion.” A 1919 Hawaiian traveler’s account written in a Hawaiian language newspaper (*Ke Aloha ‘Āina*, 8 February 1919) seems to refer to “a form like a lion” (*I kēia pali lipilipi, he ‘ano liona ke ki‘i; o Kānehoalani‘i*) located on the sharp mountain ridge of Kānehoalani.

4.1.2 Sites 304 and 514. Heiau in Makaua

McAllister (1933:165) describes Site 304 as a “. . . two-terraced heiau of massive construction and large size.” The total extent of the site is unknown as the lower of the two terraces had been obliterated on the eastern side. McAllister stated, “. . . not even the name is known. An unusual

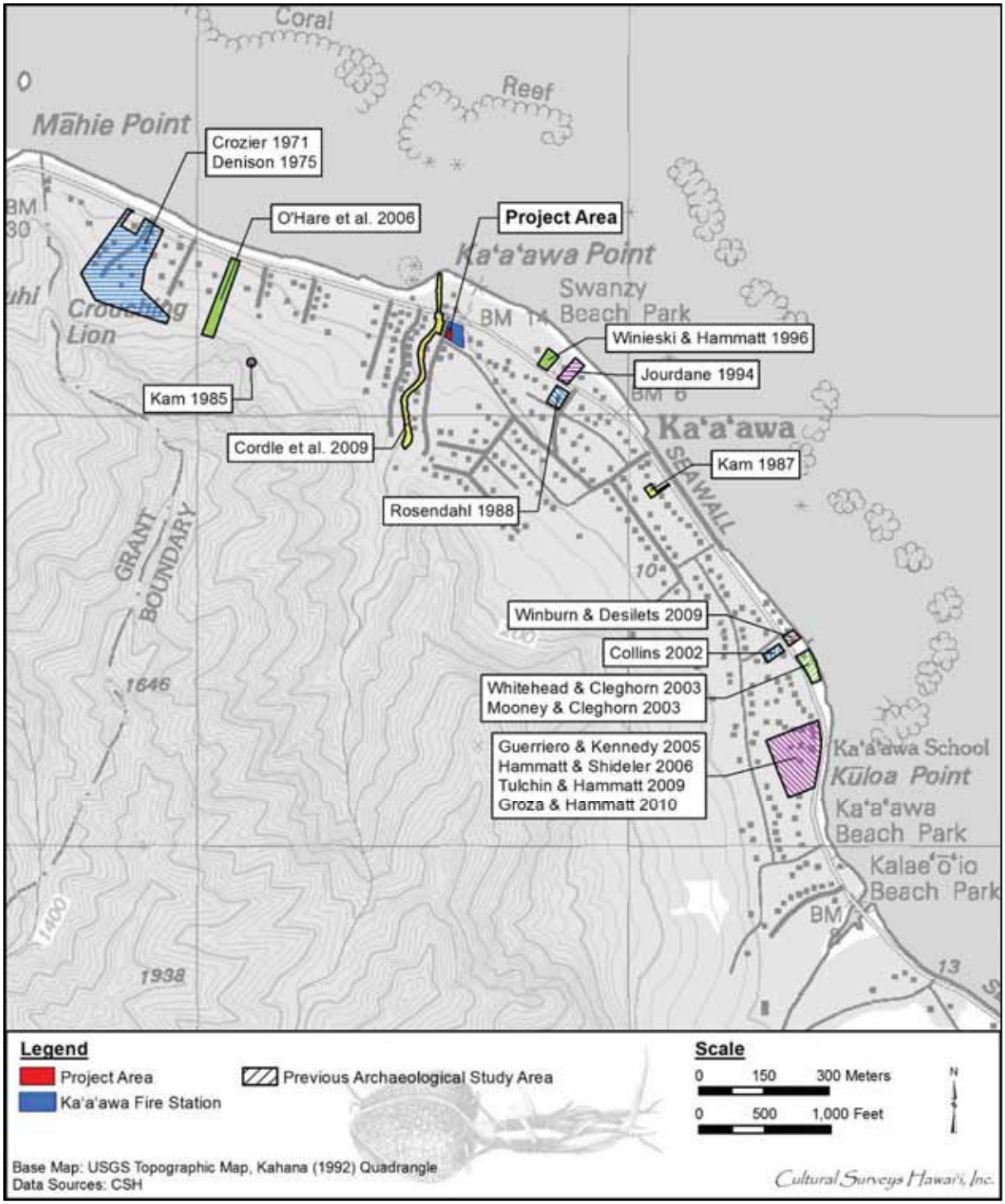


Figure 23. Portion of 1998 Kahana USGS 7.5-minute series topographic quadrangle, showing archaeological studies in vicinity of project area

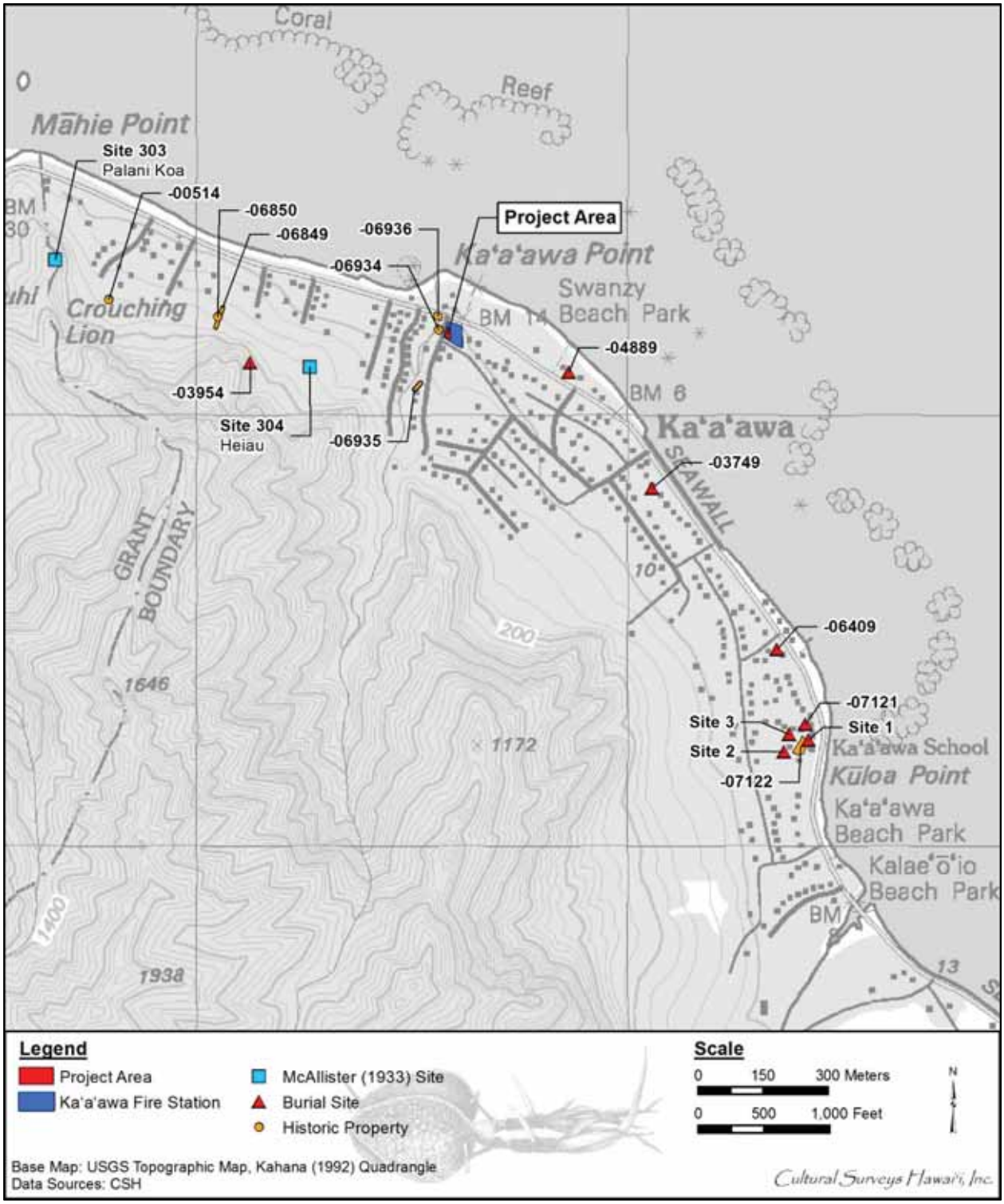


Figure 24. Portion of 1998 Kahana USGS 7.5-minute series topographic quadrangle, showing locations of previously identified archaeological sites (approximate locations of McAllister’s sites determined by overlaying his map over the modern USGS map)

Table 2. Previous Archaeological Projects at Ka‘a‘awa and Makaua Ahupua‘a

Reference	Type of Study	Location	Results (SIHP # 50-80-15****)
McAllister 1933	Archaeological reconnaissance	Island-wide	In the vicinity of the project area identified the Palani ko‘a; stone formation (SIHP # -303) and an unnamed *heiau* in Makaua (SIHP #-304)
Crozier 1971	Survey	Makaua Property (Crouching Lion), TMK: [1] 5-1-005:004	Recorded a fishing shrine (SIHP #-514)
Denison 1975	Archaeological investigations	*Mauka* end of Makaua Village, TMK: [1] 5-1-005:003	Recorded a fishing shrine (SIHP #-514)
Kam 1985	Burial report	Ka‘a‘awa Burial Cave, Waiāhole Forest Reserve, TMK: [1] 5-1-007:001	Remains of one adult male (with nineteenth century bottles) found and left in place (SIHP # -3954)
Kam 1987	Burial report	O’Connor/ Fernandez Property, 51-416 Kamehameha Hwy, TMK: [1] 5-1-010:017	One individual (SIHP # -3749)
Rosendahl 1988	Subsurface testing	Proposed Ka‘a‘awa Post Office, TMK: [1] 5-1-011:041	No findings
Jourdane 1994	Burial report	57-471 Kamehameha Hwy (Lucas Home), TMK: [1] 5-1-012:007	Found remains of four individuals in foundation footings (SIHP # -4889)
Winieski and Hammatt 1996	Subsurface testing	Proposed Ka‘a‘awa Fire Station, Swanzy Beach Park, TMKs: [1] 5-1-011:005; 5-1-012:011	Excavated 11 trenches; no findings
Collins 2002	Burial report	51-338 Kamehameha Hwy, TMK: [1] 5-1-002:064	Found remains of three individuals; left in place (SIHP # -6409)
Mooney and Cleghorn 2003	Archaeological monitoring	Ka‘a‘awa Beach Park comfort station and parking area improvements, TMK: 5-1-002:025	A single feature consisting of manmade rock pile (no SIHP # assigned and function unknown) reported along with a variety of post-Contact artifacts

Reference	Type of Study	Location	Results (SIHP # 50-80-15****)
Whitehead and Cleghorn 2003	Archaeological inventory survey	Ka‘a‘awa Beach Park, TMK: [1] 2-1-002:025	No surface remains found; no burials or cultural layers found during excavation of six backhoe trenches
Guerriero and Kennedy 2005	Burial report	Ka‘a‘awa Elementary School, TMK: [1] 5-1-002:018	Discusses one human burial find
O’Hare et al. 2006	Archaeological inventory survey	1.3-acre private residence in northwest coastal Ka‘a‘awa (Makaua), TMK: [1] 5-1-005:002	Two historic properties identified: SIHP # 50-80-06-6849, an historic boundary wall, and SIHP # 50-80-06-6850, a pre-Contact/early historic agricultural terrace
Cordle et al. 2009	Archaeological inventory survey	Along approximately 250 m of Makaua Stream in Ka‘a‘awa, TMKs: [1] 5-1-003; 5-1-007:001; 5-1-011:052; 5-1-012:014, 017; and 5-1-014:034–042 por.	Three historic properties identified: SIHP # 50-80-06-6934, a historic retaining wall, SIHP # 50-80-06-6935, another historic retaining wall containing modem additions (cement), and SIHP # 50-80-06-6936, the Kamehameha Hwy Makaua Bridge dating to1927
Tulchin and Hammatt 2009	Literature review and field inspection study	Ka‘a‘awa Elementary School	Concluded there was a likelihood of additional burials on the campus
Winburn and Desilets 2009	Archaeological assessment	0.2-acre private residence on southeast coast of Ka‘a‘awa, TMK: [1] 5-1-002:004	No surface remains found; no burials or cultural layers found during excavation of six backhoe trenches

Reference	Type of Study	Location	Results (SIHP # 50-80-15****)
Groza and Hammatt 2010	Archaeological monitoring	Ka‘a‘awa Elementary School, TMK: [1] 5-1-002:018	One set of inadvertently discovered human remains (SIHP # 50-80-06-7121); found a cultural layer within the A horizon designated SIHP # 50-80-06-7122; seven pit features consisting of in situ canine remains and six fire pit features observed within the A horizon and samples collected for possible dating; cultural materials observed during monitoring included a basalt flake, a basalt blank, a possible small hammer stone or sling stone fragment, midden and fire-cracked rock

Table 3. Previously Identified Historic Properties in the Project Area Vicinity

Site Reference	Site Type	Age	Source
50-80-15-303	Palani koa	Pre-Contact	McAllister 1933
50-80-15-304	*Heiau*	Pre-Contact	McAllister 1933
50-80-15-514	Fishing *heiau*	Pre-Contact	Denison 1975
50-80-15-3749	Human burial (1)	Unknown	Kam 87
50-80-15-3954	Human burial (1)	Unknown	Kam 1985
50-80-15-4889	Human burial (4)	Unknown	Jourdane 1994
50-80-15-6409	Human burial (3)	Unknown	Collins 2002
50-80-15-6849	Wall	Post-Contact	O’Hare et al. 2006
50-80-15-6850	Terrace	Both	O’Hare et al. 2006
50-80-15-6934	Retaining wall	Post-Contact	Cordle et al. 2009
50-80-15-6935	Retaining wall	Post-Contact	Cordle et al. 2009
50-80-15-6936	Makaua Bridge	Post-Contact	Cordle et al. 2009
50-80-15-7121	Human burial (1)	Unknown	Groza and Hammatt 2010
50-80-15-7122	Subsurface cultural deposit	Pre-Contact	Groza and Hammatt 2010
Site 1	Human burial (1)	Unknown	Guerriero and Kennedy 2005
Site 2	Human burial (1)	Unknown	Guerriero and Kennedy 2005
Site 3	Human burial (1)	Unknown	Guerriero and Kennedy 2005

amount of coral is scattered about the site.” According to the map provided by McAllister (1933:57), Site 304 would seem to be within tax map [1] 5-1-003, east of the current project area, near the *mauka* end of Ka‘a‘awa Park Lane. Whether there are any remains of this *heiau* is unknown.

In 1971, Neal Crozier of the Bishop Museum conducted a survey on the parcels [1] 5-1-005:004 and 007 (west of the current project area) before the development of the area into a townhouse complex called Makaua Village. During the survey he found several rock structures, which he interpreted as an agricultural *heiau* and designated Site -514. He mapped these structures on the project area development map. The SHPD has a copy of this letter, but not of the development map, which shows the features. In the letter, Crozier includes the original pages from McAllister’s field notes for Site -304 (numbered Site 234 in the notebooks), the unnamed *heiau* McAllister recorded in Makaua. Crozier believed the *heiau* he found was the same one McAllister had recorded in the 1930s. However, according to McAllister’s map, Site 304 was once located approximately 0.3 miles east of the Makaua Village area.

In 1975, David Denison and his class from Windward Community College returned to Makaua Village to clear, record, and reconstruct the Site -514 *heiau*, which the developers had preserved. Denison mentioned that Crozier had identified the *heiau* as Site 304, but he believed this was a mistake, and the *heiau* at Makaua Village was a separate *heiau*, one dedicated to fishing. Denison stated Site -514 was at the “*mauka* end of the Makaua Village townhouse development,” but did not provide a map. The *heiau* is plotted on Figure 24 at the *mauka* end of the village road, but this is just an approximation of its location.

4.2 Subsequent Archaeological Projects

4.2.1 Kam 1985

In 1985, Wendell Kam of the State Historic Preservation Office, inspected a small 5-by-1 m cave, located at the base of the cliffs inland of Lau Place in Ka‘a‘awa (TMK: [1] 5-1-007:001). One adult male skeleton was discovered in the cave, along with two bottles mid-to-late 1800s that were present at the head and feet of the skeletal remains. The burial was left in place (Kam 1985) and designated as SIHP # 50-80-06-3954.

4.2.2 Kam 1987

In 1987, human skeletal remains were identified during sewer line trenching activities at a private residence on the *mauka* side of Kamehameha Highway, between Pōlinalina Road, Puakenikeni Road, and Keki‘o Road (TMK: [1] 5-1-010:017). The human remains appeared to represent one individual and was designated SIHP # 50-80-06-3749.

4.2.3 Jourdane 1994

In 1994, during construction at a house lot at 57-471 Kamehameha Hwy (Paul Nahoa Lucas home; TMK: [1] 5-1-012:007), inadvertent skeletal remains were discovered. The burial site was designated SIHP # 50-80-06-4889. The SHPD report (Jourdane 1994) indicates two burials in faint burial pits were identified in situ within building footing excavations, and that remains from two additional individuals were found in the back dirt pile. The in situ burials were located between 57 cm and 70 cm below the current surface level, within a sand matrix.

4.2.4 Winieski and Hammatt 1996

In 1996, backhoe testing was conducted by CSH at the eastern end of Swanzy Beach Park, roughly 200 m southeast of the current project area. The project area was proposed for a temporary Ka‘a‘awa Fire Station to be used while the new firehouse was built next to the current project area. A portion of this project area overlapped with LCA 3954, which was claimed as a house lot with an adjacent fishery. No historic properties were identified as a result of the subsurface testing.

4.2.5 Rosendahl 1988

Rosendahl (1988) conducted subsurface testing for a proposed Ka‘a‘awa Post Office (TMK: [1] 5-1-011:041), located on the *mauka* side of Kamehameha Highway, roughly 300 m southeast of the current project area. No historic properties or burials were identified in the test units.

4.2.6 Collins 2002

In 2002, Sara Collins of the SHPD reported on inadvertent burial remains found during construction excavations for a private residence (TMK: [1] 5-1-002:064) on the *mauka* side of Kamehameha Highway, about 150 m north of Ka‘a‘awa Elementary School. The remains were from at least three individuals and were left in place.

4.2.7 Whitehead and Cleghorn 2003

In 2003, Pacific Legacy, Inc. completed an inventory survey with backhoe testing for a proposed comfort station at the Ka‘a‘awa Beach Park (TMK: [1] 5-1-002:025). No human burials or pre-Contact cultural layers were identified in the project area. An organic stain containing metal was recorded and historic artifacts (metal, plastic, and bottle glass) were collected from the project area (Whitehead and Cleghorn 2003).

4.2.8 Mooney and Cleghorn 2003

Pacific Legacy (Mooney and Cleghorn 2003) reported the results of archaeological monitoring for Ka‘a‘awa Beach Park comfort station and parking area improvements (TMK: [1] 5-1-002:025). A single feature consisting of rock pile or remnants of a once larger structure was identified during the monitoring, however, no SIHP # was assigned and its function was unknown. Historic artifacts, including glass bottles, a bead, an inkwell, and sherds of a lamp chimney glass were reported.

4.2.9 Guerriero and Kennedy 2005

Archaeological Consultants of Hawaii (Guerriero and Kennedy 2005) produced a report concerning the inadvertent discovery of human remains at Ka‘a‘awa Elementary School (TMK: [1] 5-1-002:018). It appears that three human burials were found in three locations during this work (see Groza and Hammatt 2010 for a reconstruction of details).

4.2.10 O’Hare et al. 2006

CSH (O’Hare, Shideler, and Hammatt 2006) conducted an archaeological inventory survey for a construction project on a 1.3-acre private residence in the northwestern Makaua region of Ka‘a‘awa (TMK: [1] 5-1-005:002). Two historic properties were identified; an historic boundary wall (SIHP # 50-80-06-6849) and a pre-Contact/early post-Contact agricultural terrace (SIHP # 50-80-06-6850).

4.2.11 Cordle et al. 2009

Scientific Consulting Services (Cordle, Drennan, and Spear 2009) conducted an archaeological inventory survey for a DLNR Makaua Stream Restoration project in Ka‘a‘awa, located immediately west of the current project area. The project area, beginning at the coast, was aligned along a 250-m section of Makaua Stream. Three historic properties were identified: two historic retaining walls (SIHP # 50-80-06-6934 and -6935) and the Kamehameha Highway Makaua Stream bridge (SIHP # -6936). SIHP # -6935 wall also contained recent modifications of cement.

4.2.12 Tulchin and Hammatt 2009

CSH (Tulchin, and Hammatt 2009) produced a literature review and field inspection study for Ka‘a‘awa Elementary School. The study concluded there was a likelihood of additional burials on the school campus.

4.2.13 Winburn and Desilets

Garcia and Associates conducted an archaeological assessment of a 0.2-acre private residence located on the coastal side of Kamehameha Highway, roughly 500 m north of Ka‘a‘awa Stream. The assessment consisted of the excavation of six backhoe trenches in the locations of proposed building footings. No historic properties were identified as a result of the excavations.

4.2.14 Groza and Hammatt 2010

CSH (Groza and Hammatt 2010) conducted archaeological monitoring for wastewater system and drainage improvements at the Ka‘a‘awa Elementary School campus. One set of inadvertently discovered human remains (SIHP # 50-80-06-7121) was encountered during subsurface excavations in the northeast corner of the project area. A traditional Hawaiian cultural layer was also identified (SIHP # 50-80-06-7122) that contained seven pit features, one with in situ canine remains; six were fire pit features The site’s cultural layer yielded charcoal, midden, fire-affected rock and basalt debitage and tools, including an adze blank and a possible hammer stone or sling stone fragment.

4.3 Background Summary and Predictive Model

The archival background research presented above indicates Ka‘a‘awa Ahupua‘a contained a thriving pre-Contact and early post-Contact settlement that, suggested by mid-1800s Māhele documentation, was concentrated around Ka‘a‘awa Stream Valley, in proximity to well-watered stream terraces and natural marshlands once cultivated in irrigated *kalo* or *lo‘i*.

Although few archaeological studies have been conducted in the vicinity of the project area, Handy’s (1940:93) reference to “old terraces” in Makaua between the highway and mountains, suggests the project’s nearby Makaua Stream was a viable locale for the cultivation of irrigated or semi-irrigated crops. An archaeological investigation of Makaua Stream (Cordle et al. 2009) recorded historic wall sections with modern modifactions; however, no agricultural terrraces were identified among the reportedly overgrown stream banks.

Ka‘a‘awa and Makaua Ahupua‘a were highly valued for their rich fishery and memorialized in placenames and *mo‘olelo*. A fishery claimed under a Land Commission Award (LCA 3954) located 150 m east of the project area indicates these nearby resources were coveted into historic times.

Human burials and fragmentary human remains are the most common sites encountered in Ka‘a‘awa, both *mauka* and *makai* of Kamehameha Highway. Therefore, human remains were anticipated in the project area, especially in calcarous sand deposits associated with Mokuleia Loam soil series that borders the north boundary of the project area (Foote et al. 1972:95). The closest known burials are 300 and 600 m (respectively) southeast of the current project area and occur within the Mokuleia loam soil type area.

The project area was previously modified during the construction of the Ka‘a‘awa Fire Station and former residential dwelling; therefore, no archaeological surface features were anticipated in the project area. Likewise, these historic and recent land modifications were expected to have impacted the subsurface context of the project area and to have potentially disturbed pre-Contact and post-Contact cultural layers. If intact cultural layers were preserved beneath the disturbed strata, it was anticipated their contents would reflect a coastal settlement with cultural deposits dominated by marine midden and fishing implements or an agricultural component associated with cultivation near Makaua Stream, or both functions.

Section 5 Results of Fieldwork

The archaeological assessment for the proposed Ka‘a‘awa Fire Station Communications project consisted of a 100% pedestrian inspection of the project area followed by a subsurface testing program focused on areas proposed for ground disturbance related to construction of a 120-ft communications tower and CMU building and removal of a 100-ft communications tower. No historic properties were identified during the pedestrian survey and therefore identification efforts focused on a subsurface testing program detailed below.

5.1 Subsurface Testing Results

A total of four test excavations were placed within the project area: two trenches in the footprint of the 120-ft communication tower (T-1 and T-2) and two trenches partly overlapping the fenced area in the southeast portion of the project area (Figure 25). The goal of excavating inside the fenced area was to test in close proximity to the proposed CMU building and existing communications tower and generator building slated for removal.

Upon uncovering a utility line in T-3, the excavation was abandoned and the decision was made—based on the apparent subsurface hazards and density of facility infrastructure—not to excavate inside the fenced area. As a result, the remaining T-4 excavation was reduced in size and shifted to the west, outside the fenced area. Figure 26 provides a plan view of the adjusted sizes and locations of T-3 and T-4 and the surface obstacles and utility lines encountered inside the fenced area. This modification of the testing strategy was approved during consultation between David Shideler and Dr. Susan Lebo on 6 April 2016.

The testing results indicate the project area was disturbed by construction of the 1950s residential structure and most intensively by the mid-1990s construction of the current Ka‘a‘awa Fire Station. The affected stratigraphy is evidenced by two upper fill strata consisting of introduced fill or topsoil forming the current landscaped surface (Stratum Ia) and locally procured fill and demolition debris (Stratum Ib) lying directly on an intact, non-cultural alluvial deposit (Stratum II). A portion of Stratum II was disturbed by the construction work as is indicated by the mixing of the Stratum II sediments (gravel) within Stratum Ib.

No historic properties or human skeletal remains were identified as a result of the testing. The four test excavations (T-1 through T-4) are described below with accompanying photographs, stratigraphic profiles, and a plan map of T-3’s partial excavation.

Figure 25. Aerial photograph showing pre-field proposed testing locations (Google Earth 2013)

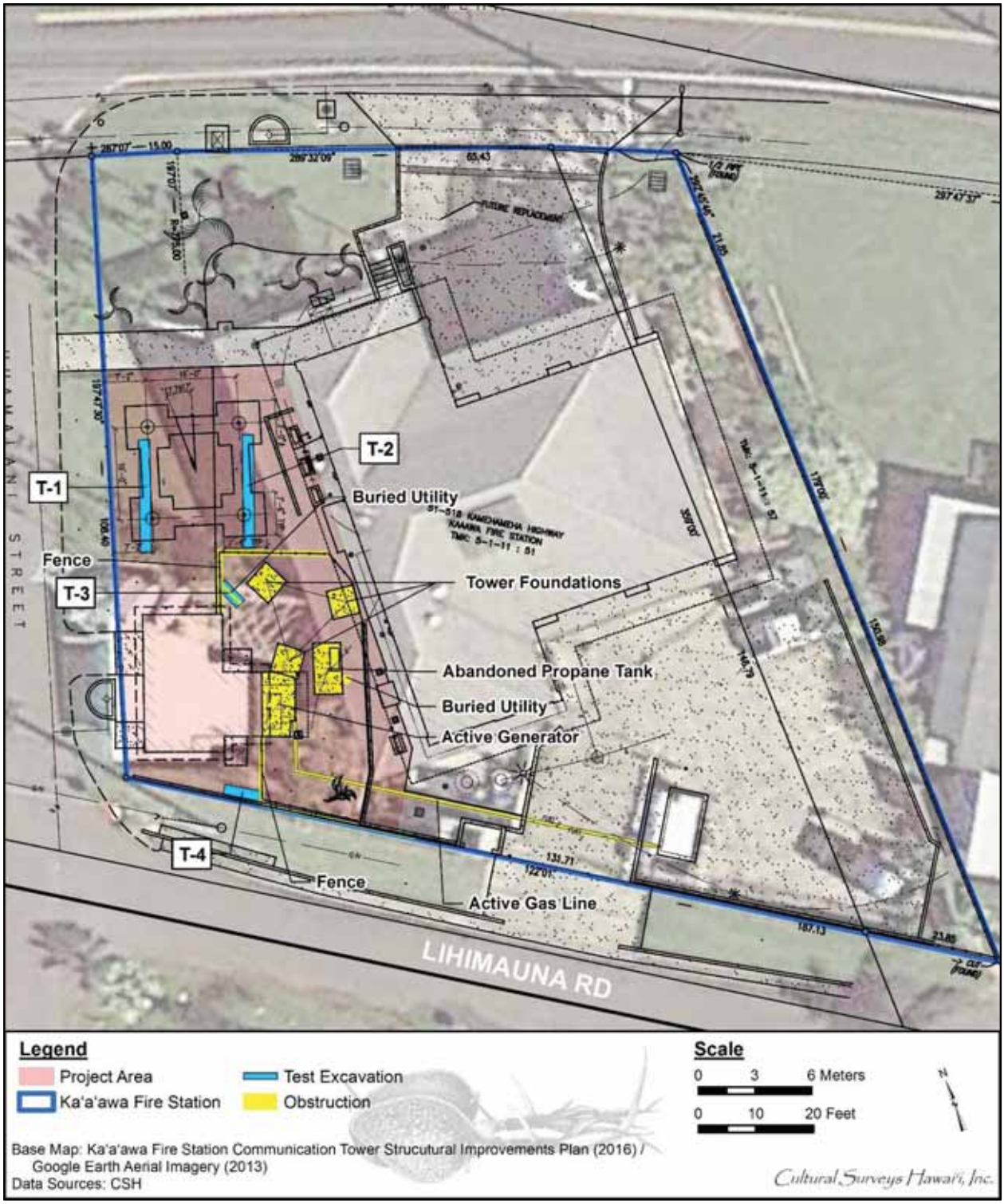


Figure 26. Aerial photograph showing adjusted trench locations and obstructions encountered in southeast corner of project area (Google Earth 2013)

5.1.1 Trench 1 (T-1)

T-1 was excavated in the northwest corner of the project area, inside the western footprint of the proposed 120-ft communications tower (see Figure 26, Figure 27). The trench, oriented northeast-southwest and measuring 6.0 m long by 0.65 m wide, was placed on a level, maintained lawn approximately 4 m east of Huamalani Street. T-1 was excavated to a maximum depth of 180 cm below surface. The southeastern wall was documented.

The stratigraphy of T-1 consists of two construction fill strata (Strata Ia and Ib) and an underlying intact gravelly sandy loam (Stratum II) (Figure 28 through Figure 30 and Table 4). The upper fill layer (Stratum Ia) was a homogenous, dark reddish brown, silty loam that represents topsoil used for the current landscaping. Stratum Ib was very dark brown, very gravelly loamy sand representing a mixed matrix of locally procured fill from the former residential lot and demolition debris from the Ka‘a‘awa Fire Station construction. Two thin lenses consisting of loamy coarse sand with crushed coral (Lens 1) and silty clay loam (Lens 2) and a 1.5-inch copper utility line were included in Stratum Ib. The lenses might indicate remnants of a former driveway or pathways related to the 1950s residence. Water-rounded gravel present in Stratum Ib indicates a portion of Stratum II was mixed with the fill.

Stratum II is an unconsolidated, gravelly sandy loam deposited as alluvium from the nearby Makaua Stream. The stratum contained varying amounts of water-rounded gravel content, with a greater amount of gravel observed near the base of the excavation and within the entire width of Stratum II in the north end of the trench. Two bulk samples of Stratum II were collected, one from the southeast wall (Figure 30), and one from the northeast wall, to be wet-screened for content in the CSH laboratory on O‘ahu. No cultural material was observed during wet-screening.

As evidenced by the stratigraphy, intensive ground disturbance associated with the prior residence and current fire house intensively impacted the upper soil strata to a maximum depth of 73 cmbs. No cultural deposits or historic artifacts were recovered from the excavation.

Figure 27. Overview of northern portion of project area, showing pre-excavation locations of Trench 1 (right) and Trench 2 (left); view to south

Figure 28. Photograph of T-1, oblique view of southeast wall; view to south

Figure 29. Photograph of T-1, southeast wall, showing close-up of demolition material in Stratum Ib; view to southeast

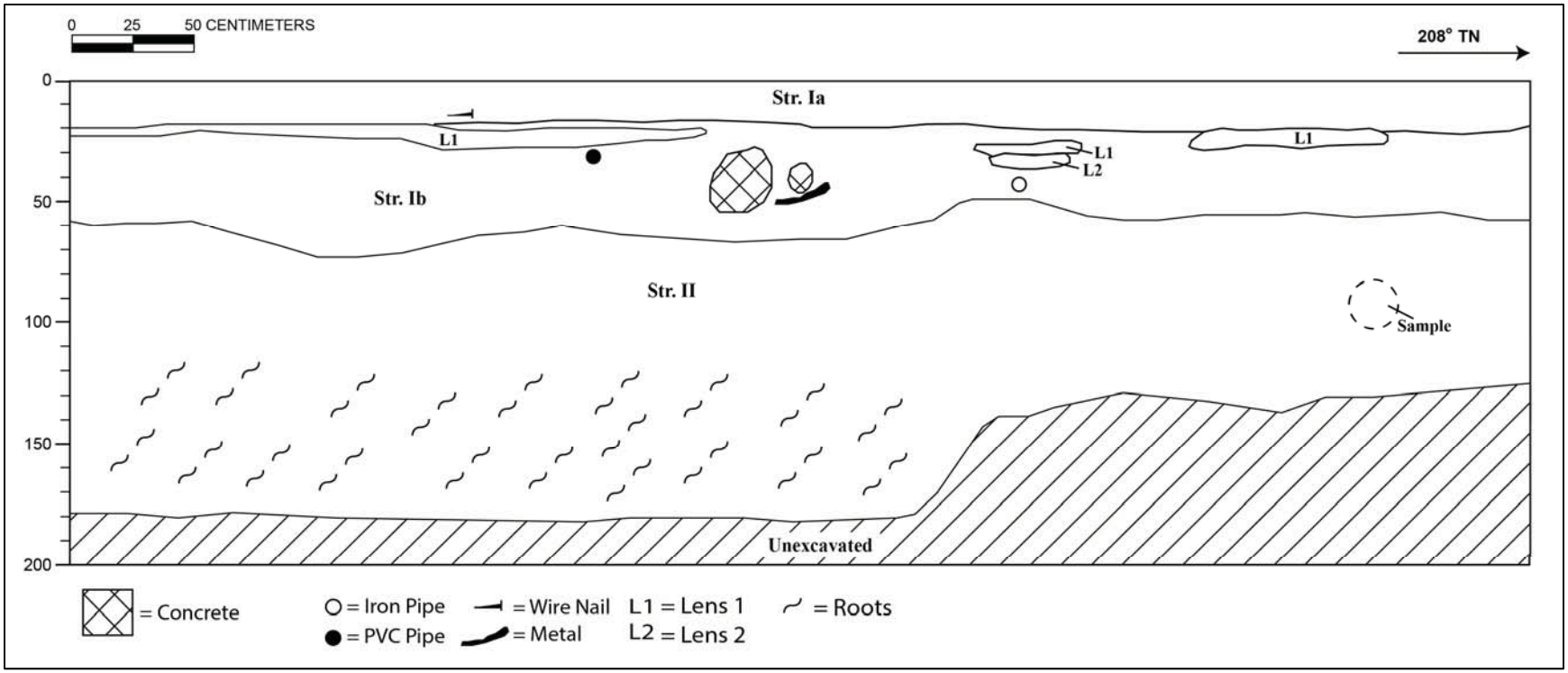


Figure 30. Stratigraphic Profile of T-1, southeast wall

Table 4. T-1 Stratigraphic Description

Stratum	Depth (cmbs)	Description of Sediment
Ia	0–22	Fill; 5YR 3/4, dark reddish brown; silty loam; moderate, medium blocky structure; moist, weak consistence; no cementation; slightly plastic; terrigenous origin; very abrupt, wavy lower boundary; fine roots common; landscaping fill for present day Ka‘a‘awa Fire Station
Ib	17–73	Fill; 7.5YR 2.5/3, very dark brown; very gravelly loamy sand; moderate, fine, granular structure; moist, loose consistence; no cementation; slightly plastic; terrigenous origin; clear, wavy lower boundary; fine roots few; fill associated with the demo of previous fire station structure, and grading for current first station Lens 1 observed within Ib; loamy coarse sand with crushed coral fill; 7.5YR 5/6, strong brown Lens 2 observed within Ib; silty clay loam; 10YR 3/2, very dark grayish brown
II	50–180 BOE	Natural; 7.5YR 2.5/2, very dark brown; gravelly sandy clay loam; moderate, fine, blocky structure; moist, weakly coherent consistence; no cementation; plastic; terrigenous origin; lower boundary not visible; few, fine roots; naturally deposited

5.1.2 Trench 2 (T-2)

T-2 was excavated in the northeast corner of the project area, within the eastern footprint of the proposed 120-ft communications tower and 5 m southeast of T-1 (see Figure 26 and Figure 27). The trench, oriented northeast-southwest and measuring 6.0 m long by 0.65 m wide, was placed on a level, maintained lawn adjacent to a plumeria tree. The tree was spared during the excavation but the underlying roots and abundant subsurface demolition debris created unstable and collapsing trench walls throughout the excavation. The southeastern wall was documented.

T-2 was excavated to a maximum depth of 165 cm below surface. The water table was not reached in the excavation. Multiple buried utilities were encountered at both ends of the trench and as a result the excavation was halted in these areas. The southwest end contained two adjacent metal pipes aligned across the width of the trench just northeast of a possible utility jacket. The southwestern utilities were between 30 and 50 cmbs and the utility jacket was marked by a large concrete slab. The northeast end of T-1 contained a fiber-optic cable aligned across the trench at 25 cmbs.

The stratigraphy of T-2 is the same as T-1; two construction fill strata (Strata Ia and Ib) and an underlying intact gravelly sandy loam (Stratum II) (Figure 31, Figure 32, and Table 5). Stratum Ib was deeper in T-2 and had an increased content of demolition debris, including large chunks of concrete with rebar and small cobble-sized concrete pieces. The two lenses of coarse sand/crushed coral and loamy coarse sand were also observed in T-2 within Stratum Ib. As evidenced by the T-2 stratigraphy, intensive ground disturbance associated with the prior residence and current fire house construction intensively impacted the upper soil strata to a maximum depth of 127 cmbs. No cultural deposits or historic artifacts were recovered from the excavation.

Figure 31. Photograph of T-2, southeast wall, view to east, note sidewall collapse from fallen demolition material

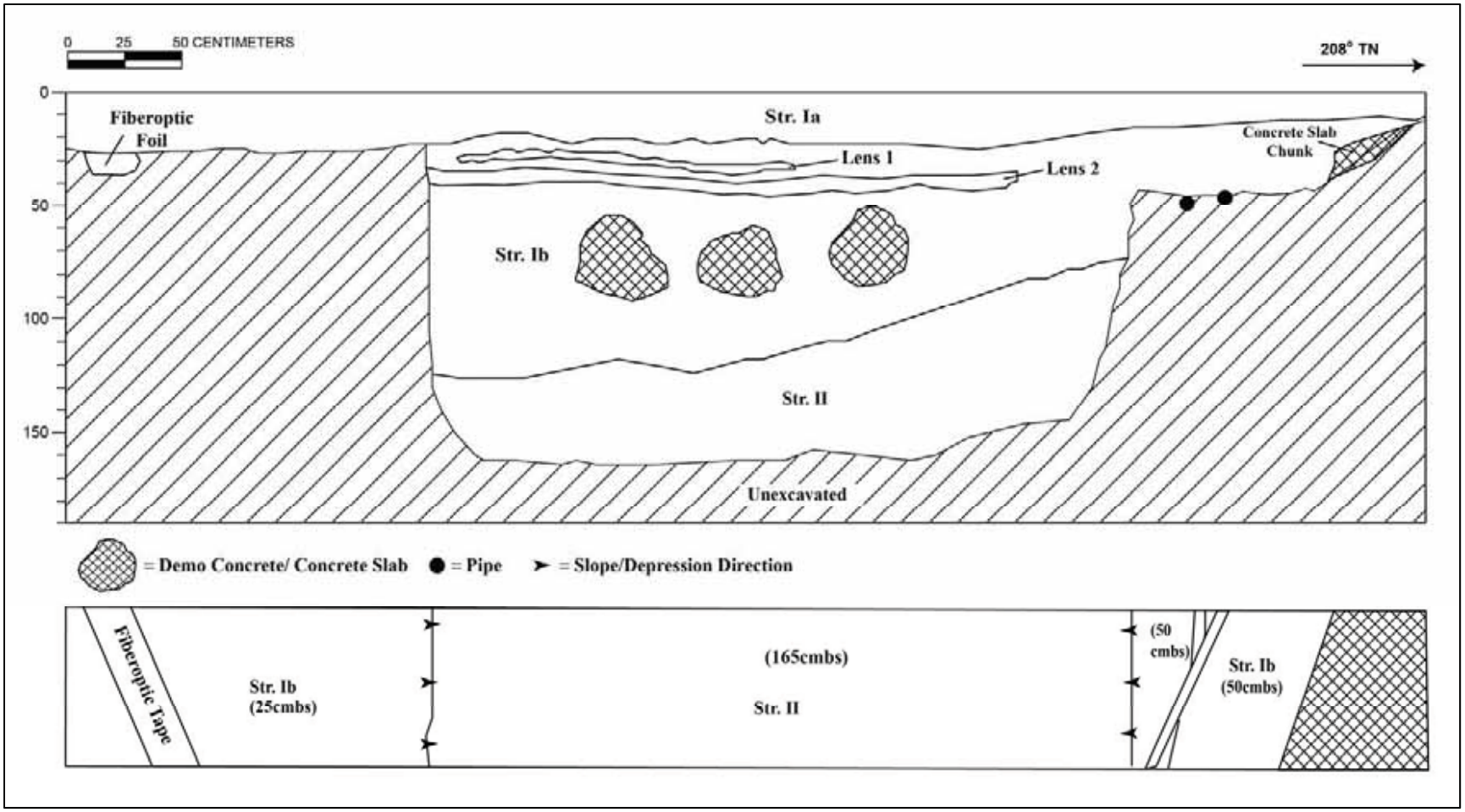


Figure 32. T-2 Stratigraphic Profile of southeast wall and plan view at base of excavation

Table 5. T-2 Stratigraphic Description

Stratum	Depth (cmbs)	Description of Sediment
Ia	0–28	Fill; 5YR 3/4, dark reddish brown; silty loam; moderate, medium blocky structure; moist, weak consistence; no cementation; slightly plastic; terrigenous origin; very abrupt, wavy lower boundary; fine roots common; landscaping fill for present day Ka‘a‘awa Fire Station
Ib	15–127	Fill; 7.5YR 2.5/3, very dark brown; very gravelly loamy sand; moderate, fine, granular structure; moist, loose consistence; no cementation; slightly plastic; terrigenous origin; clear, wavy lower boundary; fine roots few; fill associated with the demo of previous fire station structure, and grading for current first station Lens 1 observed within Ib; loamy coarse sand with crushed coral fill; 7.5YR 5/6, strong brown Lens 2 observed within Ib; silty clay loam; 10YR 3/2, very dark grayish brown
II	75–165 BOE	Natural; 7.5YR 2.5/2, very dark brown; gravelly sandy clay loam; moderate, fine, blocky structure; moist, weakly coherent consistence; no cementation; plastic; terrigenous origin; lower boundary not visible; few, fine roots; naturally deposited

5.1.3 Trench 3 (T-3)

T-3 was placed at the center of the project area, overlapping the chain-link fence that contains the current 100-ft communication tower and associated infrastructure in the southeast half of the trench (see Figure 26 and Figure 33). T-3, oriented northwest-southeast, was intended to measure 3 m long by 0.65 m wide, however unforeseen circumstances prevented full excavation, resulting in only approximately 1 m of shallow (30cmbs) excavation. A linear concrete slab aligned north-south with the fence line crossed the surface of the northwest end of the trench. The excavation was done from outside the fence with the excavator reaching through the open gate to access the southeast end of the trench. A concrete-lined utility wrapped in caution tape was identified in the southeast half of the trench at 30 cmbs. The buried utility was aligned northwest-southeast inside the trench (Figure 34 and Figure 35). The excavation of T-3 was terminated and backfilled once this utility was discovered.

No cultural deposits or historic artifacts were recovered from the T-3 excavation. The presence of the shallow utility strongly suggests further excavation within the fenced communications facility is potentially hazardous and that the subsurface was extensively disturbed by construction of the facility’s structures and subsurface utilities.

Figure 33. Location of T-3 within fenced area (background) and telecommunications tower footings and abandoned propane tank inside fenced area

Figure 34. Photograph of T-3 at base of excavation showing buried utility in lower left corner; plan view

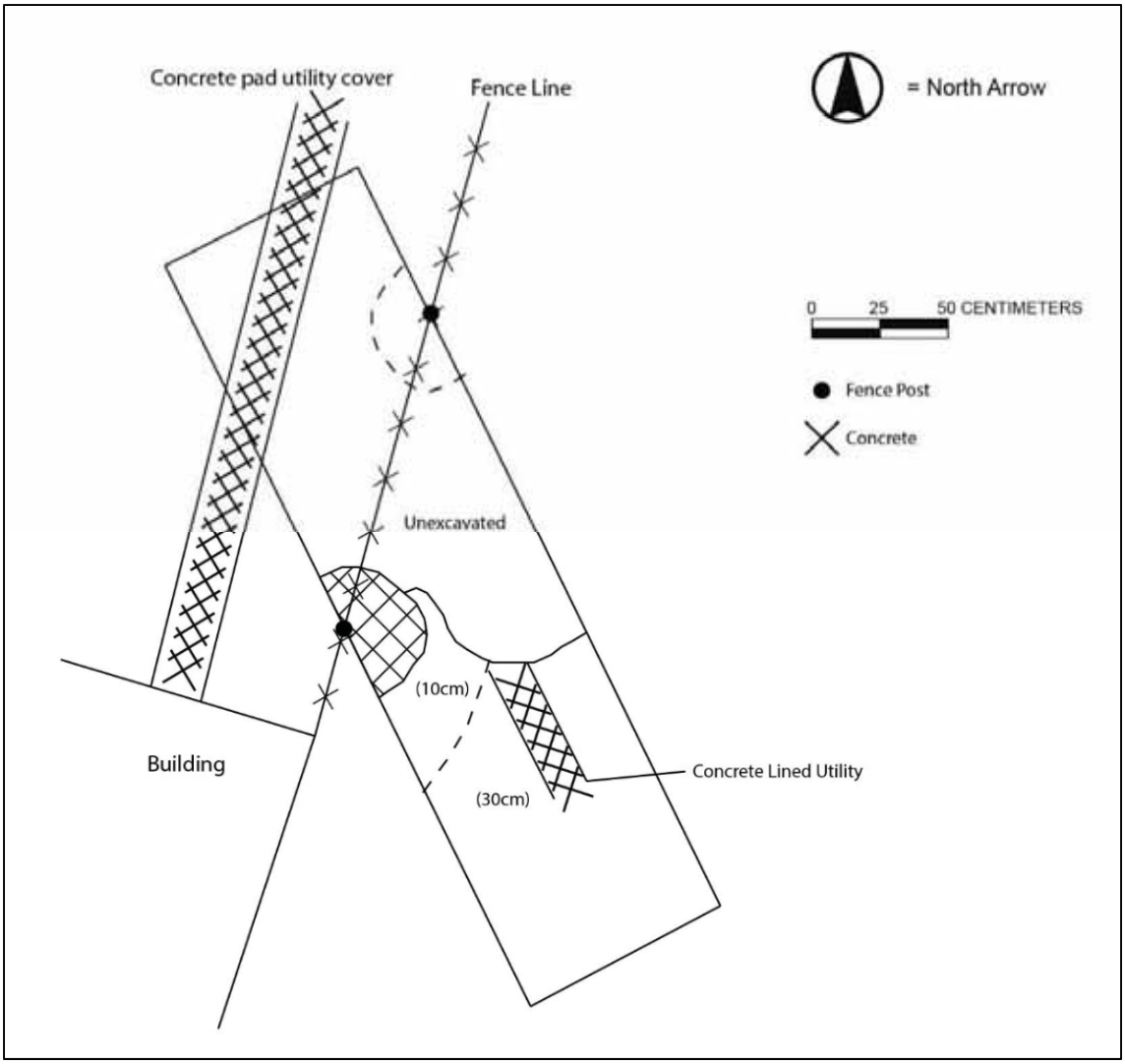


Figure 35. T-3 plan view at 30 cmbs

5.1.4 Trench 4 (T-4)

T-4 was located on a grass surface at the south edge of the project area, 1.5 m south of the current battery storage building about 4 m north of Lihimauna Road (see Figure 26). The trench, oriented in an east-west direction, measured 2.0 m long by 0.70 m wide with a maximum depth of 103 cmbs. The north wall was documented.

The stratigraphy of T-4 consists of a landscaping fill (Stratum I), comparable to Stratum Ia in T-1 and T-2, that lay directly on the intact alluvial deposit (Stratum II) also identified in T-1 and T-2 (Figure 36, Figure 37 and Table 6). The T-4 stratigraphy suggests the southern edge of the project area is less disturbed than elsewhere, with the intact Stratum II situated from 14 to 30 cm below the current ground surface. A bulk sample of Stratum II was collected from the north wall (Figure 36), to be wet-screened for content in the CSH laboratory on O‘ahu. No cultural material was observed during wet-screening. No cultural material or historic artifacts were recovered from the trench.

Figure 36. Photograph of T-4, north wall; view to north

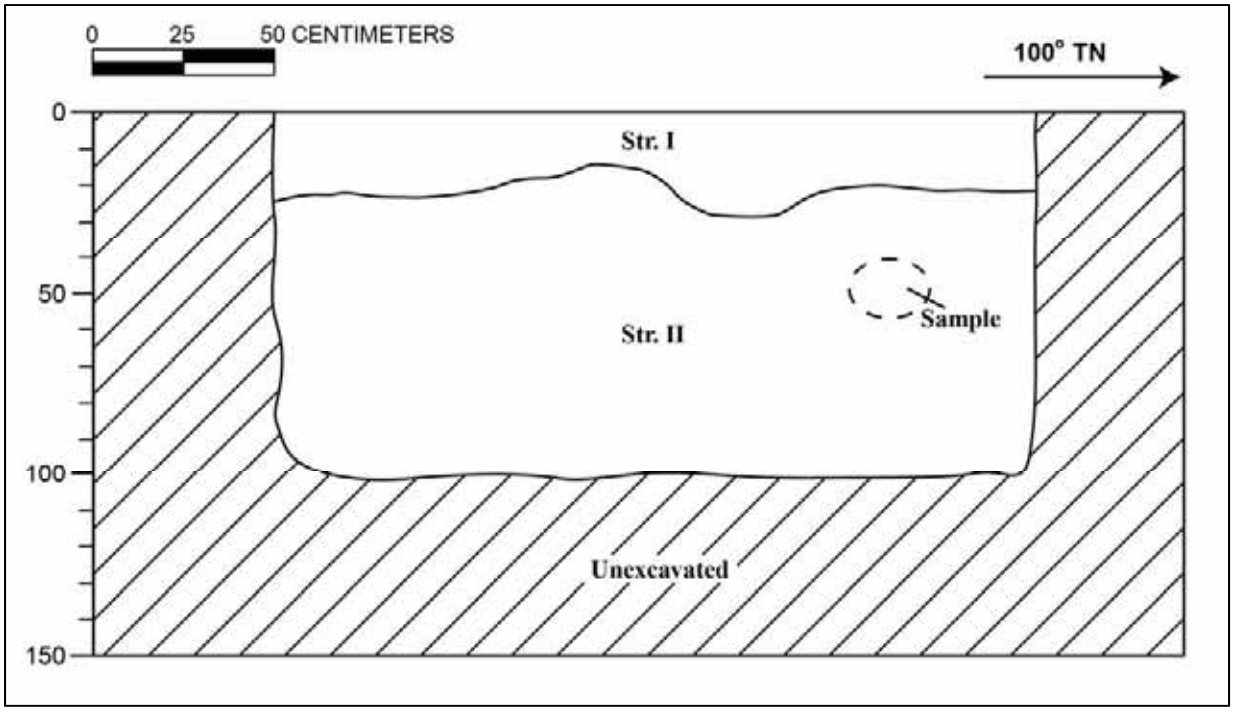


Figure 37. T-4 Stratigraphic Profile of north wall

Table 6. T-4 Stratigraphic Description

Stratum	Depth (cmbs)	Description of Sediment
I	0–30	Fill; 7.5YR 2.1/1, black; sandy loam; moderate, fine, blocky structure; moist, loose consistence; no cementation; non plastic; terrigenous origin; clear, smooth lower boundary; medium roots, common; artificial ground surface from landscaping (lawn)
II	14–103	Natural; 7.5YR 2.5/2, very dark brown; gravelly sandy clay loam; moderate, fine, blocky structure; moist, weakly coherent consistence; no cementation; plastic; terrigenous origin; lower boundary not visible; few, medium roots; naturally deposited.

Section 6 Results of Laboratory Analysis

6.1 Sediment Sample Analysis

Three 1-gallon samples were collected from Stratum II, a natural alluvium; two were collected from Trench 1 and one collected from Trench 4. These sediment samples were wet screened for content through a 1/16-inch wire mesh in the CSH laboratory. No cultural material (faunal, floral, and/or artifactual remains) was observed within this sediment sample.

Section 7 Summary and Interpretation

At the request of R. M. Towill Corporation, CSH conducted an AA of the 0.07-acre proposed Ka‘a‘awa Fire Station Communications project, in Ka‘a‘awa Ahupua‘a, Ko‘olauloa District, O‘ahu, TMK: [1] 5-1-011:051 por. The project is associated with development of a new City & County of Honolulu communications facility proposed to replace and upgrade the existing infrastructure with the construction of a new 120-ft communications tower in the north portion of the project area and a generator building (CMU building) in the southeast fenced portion of the project area. The fenced area also contains an active 100-ft telecommunications tower and generator structure proposed for removal after the new tower is completed.

The project required the excavation of four test trenches placed within the footprint of the proposed 120-ft tower and in proximity to the fenced facility area. The purpose of the archaeological assessment was to identify and document subsurface historic properties that would not be located by surface pedestrian inspection. No previous archaeological investigations were conducted inside the project area and no cultural resources were known to exist there.

The testing results indicate the project area was previously disturbed and in-filled with introduced and locally procured fill layers (Strata Ia and Ib, respectively) associated with a 1950s residential dwelling and subsequent demolition of the residence during the mid-1990s Ka‘a‘awa Fire Station construction. Stratum Ia was a homogenous topsoil applied to the entire project area for landscaping. Stratum Ib contained a mixed matrix of locally procured fill from the former 1950s residential lot and demolition debris that was reburied during the Ka‘a‘awa Fire Station construction. Abandoned and active utility lines, including a fiber-optic cable in the north portion of the project area, were associated with Stratum Ib. The abandoned lines were likely from the 1950s residence. Stratum Ib was absent from T-4, located on the south boundary of the project area, where less historic and recent development apparently occurred.

Intact alluvium (Stratum II), composed of an unconsolidated, gravelly sandy loam, was observed across the project area. In the north, Stratum II was observed beneath Stratum Ib at 50 cmbs within T-1 and 75 cmbs within T-2. Along the south boundary Stratum II was observed beneath Stratum I at a depth of 14 cmbs within T-4. The shallow depth of Stratum II along the south boundary reflects a more intact stratigraphy that was potentially less disturbed by development on the property. All of the project soils and sediment are terrestrial deposits consistent with the USDA soil series Lolekaa silty clay specified in the project area (Foote et al. 1972:83). This soil series is characterized by well-drained soils developing on fans and terraces in gravelly colluvium and alluvium. Mokuleia Loam, which contains calcareous sand below shallow alluvium, is indicated by Foote et al. (1972:95) immediately north of the project area. No evidence of calcareous sand was identified in the project area, including the northernmost test trenches (T-1 and T-2).

No historic properties or human burials were identified in the project area, which was intensively impacted by construction of the Ka‘a‘awa Fire Station and former residential dwelling. As no historic properties were identified within the project area, this investigation is termed an archaeological assessment per HAR §13-275-5.

Section 8 Project Effect and Recommendations

8.1 Project Effect

Under Hawai‘i State historic preservation review legislation, CSH’s project specific effect recommendation is “no historic properties affected.” No cultural resources were identified in the project area.

8.2 Mitigation Recommendations

This AA reports negative historic properties findings. Based on the results of the current testing, no further archaeological work is recommended. A low probability for encountering human burials in the project area is supported by an absence of calcareous sand and a cultural layer—both common contexts for indigenous Hawaiian burials reported in Ka‘a‘awa Ahupua‘a. Given the presence of calcareous sands reported by Foote et al. (1972:95) immediately north of the project area, ground disturbing activities associated with the proposed Ka‘a‘awa Fire Station Communications project, we recommend any future ground disturbing activities adhere to the project area boundaries specified in this investigation.

In the event that any potential historic properties or non-human remains are identified during construction activities, all activities will cease and the SHPD will be notified pursuant to HAR §13-280-3. In the event that human remains are identified, all earth moving activities in the area will stop, the area will be cordoned off, and the SHPD and Police Department will be notified pursuant to HAR §13-300-40.

Section 9 References Cited

Armstrong, R. Warwick (editor)
1983 *Atlas of Hawai‘i*. University of Hawaii Press, Honolulu.

Clark, John R.K.
1977 *The Beaches of O‘ahu.* University of Hawaii Press, Honolulu.
2002 *Hawaii Place Names.* University of Hawai‘i Press, Honolulu.

Collins, Sara
2002 *Report on the Inadvertent Discovery of Human Remains found at 51-338 Kamehameha Highway, Ka‘a‘awa, Ko‘olaupoko, O‘ahu*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai‘i.

Cordle, Shayna, Trisha M. Drennan, and Robert L. Spear
2009 *An Archaeological Inventory Survey for the DLNR Makaua Stream Restoration Project in Ka‘a‘awa, Ka‘a‘awa (Makaua) Ahupua‘a, Ko‘olauloa District, Island of O’ahu, Hawai‘i [TMK (1) 5-01-003; 5-1-007:001; 5-1-011:052; 5-1-012:014, 017; and 5-1-014:034-042 por.]* Scientific Consulting Services Inc. Honolulu.

Cordy, Ross
2002 *Rise and Fall of the O’ahu Kingdom*. Mutual Publishing, Honolulu

Covington, R.
1881 Hawaiian Government Survey map of O‘ahu, Hawaiian Islands. Registered Map 1381. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Crozier, Neal
1971 *Report on Survey of Makaua Property (Crouching Lion, Oahu). TMK 5-1-05.* Bernice Pauahi Bishop Museum, Honolulu.

Denison, David
1975 *Archaeological Investigations at Site 50-80-06-514, Ka‘a‘awa, Oahu, TMK 5-1-03.* Windward Community College, Kāne‘ohe, Hawai‘i.

Emerson, Nathaniel B.
1978 *Pele and Hiiaka. A Myth from Hawaii*. Charles E. Tuttle Company, Rutland, Vermont.

Foote, Donald E., Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens
1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.* U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the University of Hawai‘i Agricultural Experiment Station. U.S. Government Printing Office, Washington, D.C.

Fornander, Abraham
1917 *Fornander’s Collection of Hawaiian Antiquities and Folklore.* Volume IV, Part II. Bishop Museum Press, Honolulu.
1919 *Fornander’s Collection of Hawaiian Antiquities and Folklore.* Volume V, Part II. Bishop Museum Press, Honolulu.

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

2016 Online Rainfall Atlas of Hawai‘i. *Bulletin of the American Meteorological Society volume 94, pp. 313-316, doi: 10.1175/BAMS-D-11-00228.1.* Electronic document, http://rainfall.geography.hawaii.edu (accessed 26 April 2016).

Google Earth

2013 Aerial photographs of Hawai‘i. Google Inc., Mountain View, California. Available online at www.google.com/earth.html.

Groza, Randy and Hallett H. Hammatt

2010 *Archaeological Monitoring Report for Ka‘a‘awa Elementary School, Ka‘a‘awa Ahupua‘a, Ko‘olauloa District, O‘ahu Island.* Cultural Surveys Hawai‘i, Inc. Kailua, Hawai‘i.

Guerriero, Diane and Joseph Kennedy

2005 (Draft) *A Report Concerning the Inadvertent Discovery of Human Remains at Ka‘a‘awa Elementary School TMK: [1] 5-1-02:18 in Ka‘a‘awa Ahupua‘a, Ko‘olauloa District, Island of O‘ahu,* Archaeological Consultants of Hawaii, Hale‘iwa, Hawai‘i.

Handy, E.S. Craighill

1940 *The Hawaiian Planter, Volume 1.* Bishop Museum Bulletin No. 161. Bernice Pauahi Bishop Museum, Honolulu.

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

1972 *Native Planters in Old Hawaii: Their Life, Lore, and Environment.* Bishop Museum Bulletin 233. Bernice Pauahi Bishop Museum, Honolulu.

Hawai‘i TMK Service

2014 Portion of TMK: 5-1-011. Hawai‘i TMK Service, Honolulu.

Hawaiian Ethnological Notes

n.d. *Hawaiian Ethnological Notes,* Vol. 1:261. Bishop Museum Archives, Honolulu.

Joesting, Edward

1984 *Kaua‘i: The Separate Kingdom.* University of Hawaii Press and Kauai Museum Association, Ltd., Honolulu.

Jourdane, Elaine

1994 *Inadvertent Discovery of Human Remains at 57-471 Kamehameha Highway, Ka‘a‘awa, O‘ahu (Paul Nahoa Lucas Home).* Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai‘i.

Judd, House of

1930 Fragments V: Family Records, House of Judd. Unpublished manuscript. Hawaiian Mission Children’s Society Library, Honolulu.

Juvik, Sonia P. and James O. Juvik (editors)

1998 *Atlas of Hawai‘i.* Third edition. University of Hawai‘i Press, Honolulu.

Kam, Wendall

1985 *Ka‘a‘awa Burial Cave Field Inspection: Waiahole Forest Reserve, Ko‘olauloa, O‘ahu. TMK: 5-1-007:por. 001.* Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai‘i.

1987 *Burial Report: O’Connor/Fernandez (51-416 Kamehameha Highway), Kaaawa, Ko‘olauloa, O‘ahu, TMK 5-1-10:17.* Department of Land and Natural Resources, Division of State Parks, Honolulu.

Kamakau, Samuel Manaiakalani

1991 *Ka Pō‘e Kahiko. The People of Old.* Bishop Museum Press, Honolulu.

Kame‘eleihiwa, Lilikalā

1996 *A Legendary Tradition of Kamapua‘a, The Hawaiian Pig-God.* Bishop Museum Press, Honolulu.

Kuykendall, Ralph S.

1968 *The Hawaiian Kingdom: 1778-1854, Foundation and Transformation.* Vol. I. University of Hawaii Press, Honolulu.

Manu, Moke and Others

1992 *Hawaiian Fishing Traditions.* Dennis Kawaharada, editor. Kalamakū Press, Honolulu.

Matsushita Saito Associates and Gerald Park, Planner

1995 *Kaaawa Fire Station Replacement and Construction of a Temporary Fire Station at Swanzy Beach Park.* Prepared for Building Dept., City and County of Honolulu.

McAllister, J. Gilbert

1933 *Archaeology of O‘ahu.* Bernice Pauahi Bishop Museum, Honolulu.

Mooney, Kimberly M. and Paul L. Cleghorn

2003 *Archaeological Monitoring for the Proposed Ka‘a‘awa Beach Park Comfort Station and Parking Area Improvements, Ka‘a‘awa, Ko‘olauloa District, Island of O‘ahu (TMK 5-1-002:025).* Pacific Legacy, Inc., Kailua, Hawai‘i.

North Shore Photography/Bill Romerhaus

2017 Photograph of Hawaiian hale, possibly 1880s Ka`a`awa

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

2006 *Archaeological Inventory Survey for a Private Residence Construction Ka‘a‘awa (Makaua) Ahupua‘a, Ko‘olauloa District, O‘ahu TMK (1) 5-1-005:002.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Pratt, John Scott Boyd, Jr.

1978 A record of the descendants of Gerrit and Laura Judd, 1829-1977: a record from March 8, 1929 to April 16, 1922 . . . and the record from April 16, 1922 to May 6, 1977. Unpublished manuscript. Hawaiian Mission Children’s Society Library, Honolulu.

Pukui, Mary Kawena and Samuel H. Elbert

1986 *Hawaiian Dictionary*. Second edition. University of Hawaii Press, Honolulu.

Pukui, Mary K., Samuel H. Elbert, and Esther T. Mookini
1974 *Place Names of Hawaii.* University of Hawaii Press, Honolulu.

Rosendahl, Paul
1988 Subsurface Archaeological Reconnaissance Survey: Proposed Ka‘a‘awa Post Office Site, Land of Ka‘a‘awa, Ko‘olauloa District, Island of O‘ahu. Paul H. Rosendahl, Ph.D., Inc, Hilo, Hawai‘i.

Schmitt, Robert C.
1973 *The Missionary Censuses of Hawaii.* Pacific Anthropological Records No. 20. Bernice Pauahi Bishop Museum, Department of Anthropology, Honolulu.

1977 *Historical Statistics of Hawaii.* University of Hawaii Press, Honolulu.

Scott, Edward B.
1968 *The Saga of the Sandwich Islands. Volume I.* Sierra-Tahoe Publishing Company, Lake Tahoe, Nevada.

Sterling, Elspeth P. and Catherine C. Summers
1978 *Sites of Oahu.* Bishop Museum Press, Honolulu.

Taylor, Emma A.D.
1930 The Burial Caves of Pahukaina. *Hawaiian Historical Society Papers* 17:34–38.

Tulchin, Jon and Hallett H. Hammatt
2009 *Archaeological Assessment for Ka‘a‘awa Elementary School, Ka‘a‘awa Ahupua‘a, Ko‘olauloa District, O‘ahu Island*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

U.S. Army War Department
1919 U.S. Army War Department fire control map, Kahana quadrangle. USGS Information Services, Denver, Colorado.

1936 U.S. Army War Department terrain map, Kahana and Waikane quadrangles. USGS Information Services, Denver, Colorado. 1943

1943 U.S. Army War Department terrain map, Kahana quadrangle. USGS Information Services, Denver, Colorado.

U.S. Department of Agriculture
2001 Soil Survey Geographic (SSURGO) database. U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. http://www.ncgc.nrcs.usda.gov/products/datasets/ssurgo/ (accessed March 2005).

USGS (U.S. Geological Survey)
1928/1930 Waikane USGS topographic quadrangle

1954 Kahana USGS 7.5-minute series topographic quadrangle. USGS Information Services, Denver, Colorado.

1967 Kahana USGS 7.5-minute series topographic quadrangle. USGS Information Services, Denver, Colorado.

1978 USGS Orthophotoquad aerial photograph, Kahana quadrangle. USGS Information Services, Denver, Colorado.

1992 Kahana USGS 7.5-minute series topographic quadrangle. USGS Information Services, Denver, Colorado.

1998 Kahana USGS 7.5-minute series topographic quadrangle. USGS Information Services, Denver, Colorado.

Waihona ‘Aina

2000 *The Māhele Database*. Electronic document, http://waihona.com (accessed 10 April 2014).

Whitehead, Bonnie and Paul L. Cleghorn

2003 *Archaeological Inventory Survey for the Proposed Ka‘a‘awa Beach Park Comfort Station and Parking Area Improvements, Ka‘a‘awa, Ko‘olauloa District, Island of O‘ahu.* Pacific Legacy, Inc., Kailua, Hawai‘i.

Winburn, Mark J. and Michael Desilets

2009 *Archaeological Assessment Report for Proposed Footing Locations at Property of James Oellien, Ka‘a‘awa Ahupua‘a, Waialua District, O‘ahu*. Garcia and Associates, Kailua, Hawai‘i.

Winieski, John and Hallett H. Hammatt

1996 *Archaeological Subsurface Testing for the Proposed Ka‘a‘awa fire Station, Temporary Replacement at Swanzy Beach Park, Ka‘a‘awa O‘ahu (TMK 5-1-11:51; 5-1-12:11)*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Appendix A LCA 3954 to Newa

No. 3954, Newa

N.R. 198-199v4

To the Land Commissioners, Greetings: I hereby state my claim for land in the `ili at Kaiaka, Ahupua`a of Kaaawa, Island of Oahu. There are two taro lo`i. However, the second lo`i jumps and adjoins Kaehu's. Also there is the kai of Uki /a shore area or fishery/, a kula, and a wooded upland. My house is at Kaaawa. My right of occupancy is from the reign of Kamehameha III.

January 17, 1848

NEWA X, his mark

N.T. 37v10

No. 3954, Newa, 14 August 1851

Kapu, sworn, I have seen this interest in Kaaawa, Koolauloa, 3 sections.

Section 1 - 6 patches in Kaaawa, Koolauloa.
Section 2 - 1 house site in Kaaawa, Koolauloa.
Section 3 - 1 pasture in Kaawa, Koolauloa.

The boundaries are:
Section 1:
Mauka by Noi's land
Koolauloa by Niho and Kaehu's land
Makai by Kenuikapaole and Kapu's land
Koolaupoko by konohiki's land.

Section 2:
Mauka by konohiki's land
Koolauloa by John Ii's land
Makai by beach
Koolaupoko by konohiki's land.

Section 3:
Mauka by a pali
Koolauloa by John Ii's land
Makai by Konohiki's land
Ewa by konohiki's land.

Newa's land from Kamaikau in 1831, once it had been opposed by the konohiki.

Kaehu, sworn, I have known in the same way as Kapu has related.

[Award 3954; R.P. 1324; Kaaawa Koolauloa; 3 ap.; 1.59 Acs]

187

Uku pau loa $7.—

G. M. Robertson
J. K. Smith
Joseph Ii
J. Kekauonohi
W. Lee

Honolulu Novemaba 19, 1851

Helu 3954 Nowa. Kaaawa, Koolauloa, Oahu.

Apana 1 Aina Kula.

E hoomaka ana ma ke kihi Akau a e holo ana Ke. 2° Ki: 320 pauku e pili ana i ke ke Konohiki Ak. 89° Ki: 395 pauku e pili ana i ke ke Konohiki; Ak 12° Ko 118 pauku e pili ana i ke ke Konohiki Ak 63° Ko. 430 pauku e pili ana i ke ke Konohiki i ke kihi mua 0. 816 Eka.

Apana 2. O Loi.

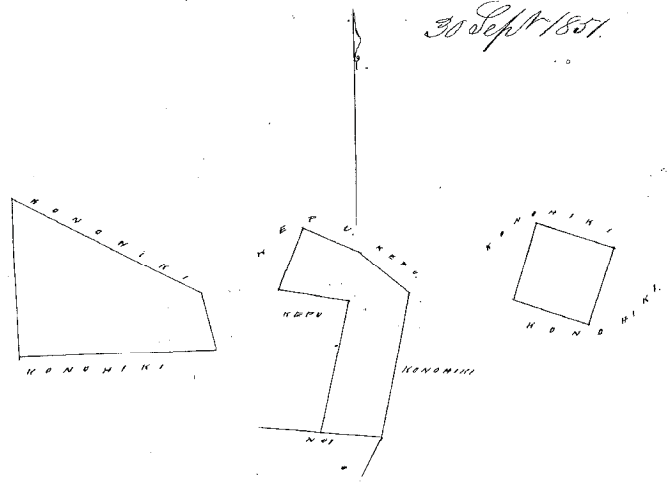
E hoomaka ana ma ke kihi Akau, a e holo ana Ke. 22° Ko. 131 pauku e pili ana i ke Kepu; Ke. 80° Ki: 140 pauku e pili ana i ke Kepu; Ka 3° Ko. 270 pauku e pili ana i ke Kepu; Ke. 85° Ki: 120 pauku e pili ana i ke Koi; Ak. 15° Ki: 300 pauku e pili ana i ke Konohiki; Ak. 57° Ko. 130 pauku e pili ana i ke Kepu; Ak. 55° Ko. 120 pauku e pili ana i ke Kepu i ke kihi mua 0. 524 Eka.

Apana 3 Pahale.

E hoomaka ana ma ke kihi Akau, a e holo ana Ke. 73° Ki: 160 pauku e pili ana i ke ke Konohiki; Ke. 18° Ko. 160 pauku e pili ana i ke ke Konohiki; Ak 73° Ko. 160 pauku e pili ana i ke ke Konohiki; Ak. 18° Ki: 160 pauku e pili ana i ke ke Konohiki i ke kihi mua 1/4 Eka

30 Sept 1851. A. F. Turner
Luna Ana Aina

816
524
250
590



Uku pau loa $6.—

G. M. Robertson
J. K. Smith
J. Kekaulahao
Joseph Ii
W. Lee

Honolulu Novemaba 19, 1851

Helu 3954 Newa Kaaawa, Koolauloa, Oahu

Apana 1 Aina Kula
E hoomaka ana ma ke kihi Akau a e holo ana He. 2º Hi. 320 pauku e pili ana i ko ke Konohiki Ak. 89º Hi. 395 pauku e pili ana i ko ke Konohiki; Ak. 12º Ko. 118 pauku e pili ana i ko ke Konohiki Ak. 63º Ko. 430 pauku e pili ana i ko ke Konohiki i ke kihi mua 0.816 Eka.

Apana 2. Loi.
E hoomaka ana ma ke kihi Akau a e holo ana He. 22º Ko. 130 pauku e pili ana i ko Kepu; He. 80º Hi. 140 pauku e pili ana i ko Kepu; He. 13º Ko. 270 pauku e pili ana i ko Kepu; He. 85º Hi. 120 pauku e pili ana i ko Noi; Ak. 15º Hi. 300 pauku e pili ana i ko Konohiki; Ak. 51º Ko. 130 pauku e pili ana i ko Kepu; Ak. 66º Ko. 120 pauku e pili ana i ko Kepu i ke kihi mua 0.524 Eka.

Apana 3. Pahale.
E hoomaka ana ma ke kihi Akau a e holo ana He. 73º Hi. 160 pauku e pili ana i ko ke Konohiki; He. 18º Ko. 160 pauku e pili ana i ko ke Konohiki; Ak. 73º Ko. 160 pauku e pili ana ii ko ke Konohiki; Ak. 18º Hi. 160 pauku e pili ana i ko ke Konohiki i ke kihi mua ¼ Eka.

30 Sept. 1851. A. T. Turner
Luna Ana Aina
[Diagram in Original]
[Text in Original: Konohiki, Konohiki]
[Text in Original: Kepu, Kepu, Konohiki, Noi, Kepu]
Text in Original: Konohiki, Konohiki]

Uku pau loa $6.-

G. M. Robertson
J. H. Smith
J. Kekaulahao
Ioane Ii
W. L. Lee
Honolulu November 19, 1851

APPENDIX C

Letter from State Historic Preservation Division Accepting Archaeological Assessment Study September 11, 2017

DAVID Y. IGE
GOVERNOR OF
HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

September 11, 2017

IN REPLY REFER TO:
Log No.: 2017.01942
Doc. No.: 1709SH07
Archaeology

Tony Velasco, Division Chief
Department of Information Technology
City and County of Honolulu
650 S. King Street, 5th Floor
Honolulu, Hawaii 96813
Email: tvelasco@honolulu.gov

Loy Kuo
Department of Design and Construction
City and County of Honolulu
650 S. King Street, 11th Floor
Honolulu, Hawaii 96813
Email: lkuo@honolulu.gov

Dear Tony Velasco and Loy Kuo:

SUBJECT: **Chapter 6E-8 Historic Preservation Review –**
Draft Archaeological Assessment Study for the Kaʻaʻawa Fire Station Facility Improvements and Tower Replacement Project
Kaʻaʻawa Ahupuaʻa, Koʻolauloa District, Island of Oʻahu
TMK: (1) 5-1-011:051 por.

Thank you for the opportunity to review the report titled, *Draft Archaeological Assessment Study for the Kaʻaʻawa Fire Station Facility Improvements and Tower Replacement Project, Kaʻaʻawa Ahupuaʻa, Koʻolauloa District, Oʻahu TMK: [1] 5-1-011:051 por.* (Robins and Hammatt, August 2017). The State Historic Preservation Division (SHPD) received this submittal on August 30, 2017. An earlier version of this report was submitted on September 30, 2016; our office requested revisions to the original draft report on May 2, 2017 (Log No. 2016.02361, Doc. No 1704SH06).

The archaeological inventory survey (AIS) was conducted by Cultural Surveys Hawaiʻi, Inc. at the request of R.M. Towill Corporation and on behalf of the City and County of Honolulu, Department of Information Technology and Department of Design and Construction for the proposed Kaʻaʻawa Fire Station Facility Improvements and Tower replacement project. The project area is on land owned by the City and County of Honolulu and has been defined as a 3,180 square ft. area (0.07 acres) located on the west side of the current Kaʻaʻawa fire station.

The proposed project includes the removal of the 100-ft telecommunications tower and generator located in the southeast portion of the project area, construction of a new one-story generator building (CMU building) at the site of the former 100-ft tower, and construction of a new 120-ft telecommunications tower in the north portion of the project area. Ground disturbing activities associated with the CMU building will include excavations for a foundation measuring 16 feet (4.9 meters) by 24 feet (7.32 meters) to the depth of 1.5 feet (0.46 meters) below surface with footings extending to approximately 2.5 feet (0.77 meters) below the surface. Ground disturbance for

the new tower will include excavations to a depth of approximately 5 feet (1.5 meters) below surface for four micropile caps, each measuring 9 square feet (2.75 $m^{2)}$ with four connecting grade beams. Each of the four pile caps will include 12 micropiles drilled to a depth of approximately 35 feet (10.7 meters) below surface. Additionally, concrete footings for a chain link fence and concrete wall will extend approximately 3 feet (0.91 meters) below surface.

An archaeological inventory survey testing strategy was developed through consultation with the SHPD Archaeology Branch to identify, document, assess, and make mitigation recommendations for archaeological historic properties that may exist on the subject parcel in advance of the proposed project. The testing strategy involved the excavation of four test trenches, however excavation of one of the trenches was abandoned when subsurface utilities were encountered. Due to negative findings during the AIS, the results are reported as an archaeological assessment (AA) per Hawaii Administrative Rules (HAR) §13-275-5. The report indicates that given the results of the AIS, and the low potential for any significant archaeological sites in the project area, no further archaeological work is recommended. **SHPD concurs** with the report's project effect determination and recommendation of no further archaeological work for the proposed project.

Please note that in the unlikely event that subsurface historic resources, including human skeletal remains, structural remains, cultural deposits, artifacts, sand deposits, or sink holes are identified during the demolition and/or construction work, cease work in the immediate vicinity of the find, protect the find from additional disturbance, and contact the State Historic Preservation Division, at (808) 692-8015.

The archaeological assessment satisfies the requirements stipulated in (HAR) §13-276-5. **The report is accepted**. Please send one hardcopy of the document, clearly marked FINAL, along with a text-searchable PDF version to the Kapolei SHPD office, attention SHPD Library.

Please contact Stephanie Hacker at (808) 692-8046 or at Stephanie.Hacker@hawaii.gov for matters regarding archaeological resources or this letter.

Aloha,

Susan A. Lebo

Susan A. Lebo, PhD
Archaeology Branch Chief

cc: Laura Mau, R.M. Towill (lauram@rmtowill.com)
Doug Borthwick, Cultural Surveys Hawaii (dborthwick@culturalsurveys.com)

APPENDIX D

Certificate of Categorical Exclusion for Antenna Installations Approved June 29, 2017

CERTIFICATION OF CATEGORICAL EXCLUSION FOR ANTENNA INSTALLATIONS

This certification shall be submitted with all Land Use Permit applications for antenna-related *utility installations* (see LUO Sec. 21-10.1). It shall be signed by the applicant who shall be responsible for the veracity of the information submitted, herein.

Tax Map Key: 5-1-011:051

Applicant: City and County of Honolulu
(If company, list company name)

Signature: _____ 06/29/2017
Applicant Date

PART I.

The proposed utility installation will be operated in the Multi-point Distribution Service, Paging and Radiotelephone Service, Cellular Radiotelephone Service, Narrowband or Broadband Personal Communications Service, Private Land Mobile Radio Services Paging Operations, Private Land Mobile Radio Service Specialized Mobile Radio, Local Multi-point Distribution Service, or service regulated under CFR Part 74, Subpart I:

☑ Yes (Circle the applicable service, above) ☐ No _____
Indicate the type of service

The proposed antenna will be a *freestanding antenna structure* (see LUO Sec. 21-10.1): ☑ Yes ☐ No

The lowest point of any antenna associated with the proposed utility installation will be at least 10 meters (~33 feet) above the ground: ☑ Yes ☐ No

If the response to **ALL** three of these questions is "Yes", then the proposed utility installation **IS** categorically excluded. It is unlikely to cause exposure in excess of the FCC's guidelines. You do not need to complete Parts II, III or IV of the certification.

If the response to **ANY** of the three questions is "No", then you must complete Part II of the certification.

Part II.

The *transmitting antennas* (see LUO Sec. 21-10.1) associated with the proposed utility installation will be inaccessible to the public:
☐ Yes ☐ No

_____

_____
Briefly describe how the antennas will be rendered inaccessible to the public

If the response is "Yes", then the proposed utility installation **IS** categorically excluded. It is unlikely to cause exposure in excess of the FCC's guidelines. You do not need to complete Parts III or IV of the certification.

If the response is "No", then you must complete Part III of the certification.

PART III.

This is a:
- ☐ Single facility site (the site contains ONLY ONE antenna array). Please complete Part III of the certification.
- ☐ Multiple facility site (the site contains MORE THAN ONE antenna array). Please skip the remainder of Part III of the certification and proceed to Part IV.

Please provide the following information and calculations.

A. Enter the power threshold for categorical exclusion for this service from the attached Table 1 in watts ERP or EIRP [note: EIRP = (1.64) x ERP]:
_____

B. Enter the total number of channels if this will be an omnidirectional antenna(s), or the maximum number of channels in any sector if this will be a sectored antenna:
_____

C. Enter the ERP or EIRP per channel using the same units as in "A":
_____

D. Multiply the answer from "B" by the answer from "C":
_____

The response to "D" is less than or equal to the value for "A": ☐ Yes ☐ No

If the response is "Yes", then the utility installation **IS** categorically excluded. It is unlikely to cause exposure in excess of the FCC's guidelines. You do not need to complete Part IV of the certification.

If the response is "No", the utility installation is **NOT** categorically excluded and you must complete Part IV of the certification.

PART IV.

Estimate the "worst case" horizontal distance which must be maintained.

A. This is a:
- ☐ Single facility site (the site contains ONLY ONE antenna array). Enter the ERP or EIRP for the proposed antenna array:
_____
- ☐ Multiple facility site (the site contains MORE THAN ONE antenna array). Enter the **TOTAL** ERP or EIRP for **ALL** antenna arrays at the site, including the proposed antenna installation:
_____

B. Based on the ERP or EIRP from "A", enter the estimated "worst case" horizontal distance (in feet) that should be maintained for the service from the attached Appendix B:
_____

The estimated "worst case" horizontal distance **MUST** be indicated on the plans submitted with your Land Use Permit application. The plans **MUST** also indicate how public access will be prevented within this distance.

If the estimated "worst case" horizontal distance cannot or will not be maintained, then your application **MUST** include adequate documentation demonstrating how the proposed antenna installation has otherwise complied with the FCC's exposure guidelines, or the application will not be accepted as "complete" for processing purposes.

APPENDIX E

Record of Consultations

Kaaawa Community Association Meeting
December 13, 2016

Ko‘olauloa Neighborhood Board No. 28
January 12, 2017

Ka‘a‘awa Community Association Meeting
March 14, 2017

Discussion of Kaaawa Fire Station Communications Facility Improvements and Tower Replacement Project highlighted in yellow below in Item 4(c)

KA`A`AWA COMMUNITY ASSOCIATION MEETING
DATE: Tuesday December 13, 2016
TIME: (7:00 – 8:30 P.M.)
LOCATION: KA`A`AWA ELEMENTARY SCHOOL

MINUTES – APPROVED on March 14, 2017

1) Welcome
   a) Minutes of the last meeting – not available, will approve next meeting
   b) Treasurer's Report
      i) Current balance: $1079.35.
      ii) Several people provided their dues checks for 2017 ($12 per person)
2) Community Reports
   a) Ka`a`awa Elementary School – Principal Jennifer Luke-Payne reporting
      i) 5k Fun run will be on 4/8/17 https://www.facebook.com/Kaaawa5K/
      ii) 2nd annual Makahiki festival will be at the Ranch on Jan 20 for 4th grade, Jan 21 (Saturday) for the public
      iii) PCNC (Marie Sack: http://kaaawaelementary.weebly.com/, pcnckaaawa@gmail.com)
         (1) School PCNC is planning a fundraiser. Public will be able to order food parcels for $25 to be picked up at school, part of proceeds go to school. Mostly fresh fruit & veggies. Run by the Kokua Hawaii Foundation.
         (2) Contact Marie if you are interested. She will send out fliers with more info soon.
   b) Neighborhood Board – Dee Dee Letts reporting
      i) Hauula fire station design was presented – some concern from the public about possibly adding a traffic light
      ii) Neighbourhood board elections will be in April 2017 - Dee Dee has represented Kaaawa for many years and is keen to pass on the torch and mentor anyone wanting to run for election to represent us. Deadline to register as candidate is Feb 17, 2017 (http://www.honolulu.gov/nco/nbelections.html).
   c) HPD – Corporal Ofeina Unga (ounga@honolulu.gov) of HPD Community Policing Team reporting
      i) Kaaawa Beach Park complaints about camping/noise/mess
         (1) Can enforce camping laws: if tent has at least one side so popup is not a tent. 30 or more people requires a permit. Could request Parks Dept to close park 10pm to 5am if community wants, but fishing still allowed.
         (2) Please report all disturbances to 911 – this creates a record that can help CPT get more resources.
         (3) Abandoned car towing gets batched – next towing for Kaaawa is in January. There has been difficulty getting room at impound lot. Report here: http://www3.honolulu.gov/csdavcomplaints/
         (4) Beware some social media falsely reporting and using HPD emblem. Stolen Stuff Hawaii facebook is OK.
   d) Kualoa Ranch Report – no report
3) Old Business
   a) Andrea: update on Oahu Metropolitan Planning Organization (OMPO)
4) New Business
   a) Kaaawa Magazine – this interesting magazine was published for many years in the 1980s when Kaaawa had a very active community - copies provided by Andrea for people to see
   b) KC Connors reported:
      i) New bus schedule improved bus to 35 minutes during busy times
      ii) Homeless – in order to get more money to deal with problem we need a better count of how many homeless are in our area. Training is being offered for anyone who wants to help the Point in Time Count in January: http://www.partnersincareoahu.org/2017-point-time-count-oahu
   c) Presentation about replacement of communication tower at Fire Station – RM Towill: Laura Mau, City Dept of Design & Construction: Curtis Kushimaejo, AAI Architects: Edmund Chang

i) Tower is used for HPD & HFD emergency communications as part of island wide network. Tower is badly corroded and was repaired but needs replacement.

ii) Replacement tower is a bit taller (120ft vs 100ft), square vs existing triangular. Replacement tower would be built makai of existing tower and then existing tower removed. Slight renovation to existing equipment building to support new generator. No change to fire station. New tower will be fenced.

iii) It is believed that there will be minimal effect on view planes, however residential views along Huamalani Rd near Kamehameha Hwy will change.

iv) KCA passed a motion in support of the replacement of the communication tower. Proposed by Kaye Walsh, seconded by Starr Domingo, no Nay's

v) Comment period open – contact KCA or Curtis Kushimaejo ckushimaejo@honolulu.gov

vi) The project will be presented to the Koolauloa Neighborhood Board and then back to KCA on March 14th.

vii) Assuming approvals, the project will probably start in late 2017 or early 2018 and last approx 10 to 12 Months

5) Announcements

a) Next regular meeting: March 14, 2017

Discussion of Kaaawa Fire Station Communications Facility Improvements and Tower Replacement Project highlighted in red below on Pages 4 and 5.

KO'OLAULOA NEIGHBORHOOD BOARD NO. 28

NEIGHBORHOOD COMMISSION • 925 DILLINGHAM BOULEVARD, SUITE 160 • HONOLULU, HAWAII, 96817
PHONE (808) 768-3710 • FAX (808) 768-3711 • INTERNET http:///www.honolulu.gov/nco

DRAFT REGULAR MEETING MINUTES
THURSDAY, JANUARY 12, 2017
KAHUKU COMMUNITY CENTER

CALL TO ORDER – Chair Verla Moore called the meeting to order at 6:11 p.m. **Quorum was established with nine (9) members present.** Note – This 11-member Board requires six (6) members to establish quorum and take official Board action.

Members Present – Hannah Anae, Randall Au, Vanley Auna, Kent Fonoimoana, Dee Dee Letts, Kela Miller, Verla Moore, Jacob Nihipali, and Diane Tafua.

Members Absent – John Elkington and Louis Prescott.

Guests – Captain Brendan O'Connor and Fire Fighter III Cade Oyadomari (Honolulu Fire Department); Lieutenant John Asing and Sergeant Andre Carreira (Honolulu Police Department); Major Jeremy Pitaniello (United States Army); Michael Sakata (Councilmember Ernie Martin); 'Aukai Walk (Representative Sean Quinlan); Tony Velasco and Alvin Sunahara (Department of Information Technology); Russell Kaneakua (Honolulu Fire Department); Laura Mau (RM Towill); Edmund Chang (Anbe, Aruga and Ishizu Architects, Inc.); Joey Char (Kamehameha Schools); Andrea Renaud, Buddy Ako, KC Connors, Marvin Iseke David Mitchell and Zeni Iese; Videographer ('Olelo); and Sharon Baillie (Neighborhood Commission Office).

Honolulu Fire Department (HFD) – Firefighter III Cade Oyadomari reported the following:

- December 2016 Fire Statistics – There were 2 wildland/brush fires and 5 activated alarms. There were 48 medical emergencies, 1 motor vehicle collision with pedestrian, 6 motor vehicle crashes/collisions, 3 mountain rescues and 1 ocean rescue.
- Fire Safety Tip – Fall Prevention for Seniors:
    - Regular exercise will help build strength, improve balance, and enhance coordination.
    - Take your time when getting out of chairs and be aware of your surroundings.
    - Keep stairs and walkways clear.
    - Improve lighting inside and outside of your home.
    - Use nonslip mats – this increases safety in the bathtub and on shower floors.
    - Be aware of uneven surfaces.
    - Wear Sturdy, well-fitting shoes.

Questions, comments, and concerns that followed:

1. Mountain Rescue – Tafua inquired and Firefighter III Oyadomari answered that the mountain rescues took place in Ka'a'awa at Crouching Lion, which resulted in one (1) death.
2. Thanks – Miller thanked HFD for their response regarding an accident at 55-666 Kamehameha Highway.
3. Fire Hydrants – Au asked and Firefighter III Oyadomari responded that the City and County owned fire hydrants are tested on a yearly basis for pressure and water flow by the Board of Water Supply (BWS).

Honolulu Police Department (HPD) – Lieutenant John Asing reported the following:

- December 2016 Crime Statistics – There were 3 motor vehicle thefts, 6 burglaries, 16 thefts, and 9 unauthorized entries into motor vehicles (UEMV's).
- Crime Mapping – To see specific crimes and where they took place, please go to www.honolulupd.org for more information.
- Neighborhood Watch – For more information on how to get involved with a neighborhood watch program, please contact 723-8613.
- Abandoned Boat – The abandoned boat in Hau'ula is still there and is with the Abandoned Vehicle (AV) section. For any concerns about abandoned vehicles and boats please call the AV section at 768-2530.

Questions, comments, and concerns that followed:

1. Concerns – Chair Moore noted that the number one (1) concern in the area is abandoned vehicles crowding Kamehameha Highway and communities. Chair Moore stated that the issue has gotten so bad it is hard to

drive on the streets in La'ie, Kahuku, and Hau'ula. Chair Moore added that some vehicles near her home have five (5) or six (6) tickets and have not been towed. Lieutenant Asing suggested to anyone with this issue to call HPD and have a supervisor come out to assess the situation. If the vehicle has expired registration or safety check, it can be towed. If the vehicle has been marked as abandoned then it is in the hands of the AV section.

2. Abandoned Vehicles – Auna inquired and Lieutenant Asing noted that cars can be ticketed and towed away immediately if the safety check or registration is expired and on a public roadway. Auna asked and Lieutenant Asing answered that vehicles go to the AV section 24 hours after a vehicle has been marked as abandoned and has not moved.
3. Illegal Activities – Tafua asked and Lieutenant Asing answered to call HPD if someone suspects there is illegal activities taking place out of the abandoned vehicles. Anyone can call, leave an anonymous tip or leave their name, and an officer will be dispatched out to the location to assess the situation.
4. Community Policing – Letts noted that the community policing team came to the Ka'a'awa Community Association (KCA) meeting and were very helpful in suggesting that if there are problems with people in parks after hours, that putting up closure signs may be a solution.

US ARMY REPRESENTATIVE – Major Jeremy Pitaniello reported the following: Tour – The Kahuku Training Area (KTA) tour was originally scheduled for the end of the month in January 2017. However due to scheduling conflicts with military training taking place, the tour has been moved to February 2017. If anyone is interested in going on the KTA tour please get in contact with Major Pitaniello or the board.

APPROVAL OF THE NOVEMBER 10, 2016 REGULAR MEETING MINUTES – **Without any objections, The November 10, 2016 regular meeting minutes were APPROVED BY UNANIMOUS CONSENT, as amended 9-0-0 (AYE:** Anae, Au, Auna, Fonoimoana, Letts, Miller, Moore, Nihipali, and Tafua; **NAY:** None; **ABSTAIN:** None**).**

1. **PAGE 4:** Under Trucks change "fire ladder" to "**ladder truck**".

Treasurers Report – Treasurer Miller reported that $23.91 was spent in the month of December 2016 and that there is a remaining balance of $259.81. The report was filed.

COMMUNITY REPORTS

Kahuku – Fonoimoana reported the following:

- Holiday Party – The Kahuku Community Association (KCA) held a wonderful holiday party at the Kahuku Community Center, and thanked everyone that made donations.
- Hearing – On Friday, February 2, 2017 at 6:30 p.m. at Kahuku High School, the Public Utilities Commission (PUC) will be holding a hearing on the proposed Na Pua Makani wind turbines.
- Contested Case – The KCA filed a contested case hearing against the Department of Land and Natural Resources (DLNR) habitat conservation plan, which will be heard tomorrow, Friday, January 13, 2017 at 9:00 a.m. at the Kalanimoku Building.

Hau'ula – Nihipali reported the following:

- Events
    - Saturday, March 25, 2017. 9:00 a.m. – 5:00 p.m. Ho'olaule'a at the community park next to Hau'ula Elementary School.
    - Every 1st Monday of the month there are security walks.
    - Every 2nd Monday of the month there is sign waving to promote for safer driving and drug awareness.
    - Saturday, January 14, 2017. Red Cross Training on Shelter Fundamentals.
    - Saturday, January 21, 2017. There will be an amateur radio class held at the civic center from 9:00 a.m. to 11:00 a.m.
    - The Oceanfest will take place in June 2017.
- North Shore Tacos – Chair Moore introduced North Shore Tacos owner Joseph Fullmer who reported the following:
    - Fullmer is looking to expand his business by applying for a liquor license. The revenue would help make improvements to the parking lot. The restaurant would close around 10:00 p.m. with a possibility of having local acoustic artists on occasion. Customers would be required to order food along with any alcoholic beverage purchase made. The public hearing for the liquor license application will be held on, Thursday, February 9, 2017, at 4:00 p.m. at Pacific Park Plaza.

Questions, comments, and concerns that followed:

1. Security – Fonoimoana inquired and Fullmer answered that he does not anticipate a need to hire a security guard, but if one (1) was needed he would look into it.
2. Why – Letts asked and Fullmer responded that he was unable to afford a liquor license in previous years, and that the revenue would help make improvements to the property, and allow him to eventually own a home for his expanding family.
3. Alcohol – Nihipali asked and Fullmer stated that the alcohol menu would be simple, with a possibility of a few beers on tap, a few choices of bottled beer, and a couple of mixed drink options.

- Hau'ula Continued – Auna reported the following:
  - Hau'ula is in the process of setting up a Crafting Committee.
  - Maunawila Heiau of the Hawaii Land Trust is vibrant and active.
  - The Ko'olauloa Kupuna Club services adults of 60 years of age and older. Oceanside Assisted Living provides meals for these seniors.
  - The annual sidewalk sale in Hau'ula took place next to Hau'ula Elementary School with was a tremendous success.
  - Thank you to all people providing services to the community, to make it a safer place for all.

Punalu'u – Anae introduced Joey Char from Kamehameha Schools who reported the following:

- An 11 week Board and Stone Class which will take place every Saturday from 9:00 a.m. to 11:00 a.m. and will begin on Saturday, February 11, 2017. To register go to www.ksbe.edu/punaluu.
- Starting in April 2017, people will have a chance to buy farm fresh produce, and receive a weekly allotment of fruits and vegetables. For more information on how to sign up go to www.ksbe.edu/punaluu.

Ka'a'awa – Letts reported the following:

- The Ka'a'awa Community Association had a great meeting with the local community policing team and will be looking into getting support from the Neighborhood Board to request park closure signs.

La'ie – Miller report the following:

- La'ie celebrated a wonderful Christmas Tree Light display.
- Junior Ah You will be inducted into the 2017 Polynesian Football Hall of Fame class.
- Chair Moore noted that La'ie Elementary School is running a similar program to the one (1) in Punalu'u, which provides people who sign up with fresh produce every week. If 25 people sign up at the school then $5 of every person who signs up will go back to the school.

NEW BUSINESS

Ka'a'awa Fire Station Communication Facility Improvements and Tower Replacement – Tony Velasco, Edmund Change and Laura Mau reported the following:

- Tower Replacement – The tower is owned by and sits on City and County of Honolulu land. The City may issue an environmental assessment (EA) exemption as the tower is a replacement and not a new tower. Once this is issued then a special management area (SMA) permit will be sought to continue the project. The current tower is in advance deterioration. A new tower will provide a critical piece to the City's public safety communication system which is utilized by HFD and HPD. The current tower sits at a height on 100 feet with a triangle base, which holds three (3) microwave dishes and multiple antennas. The new tower would be 120 feet and have a quad system base. An archaeological assessment has shown no cultural impact to where the new tower would be placed. Once everything is approved, the construction process would take 10 to 12 months with a cost of $3.8 million dollars.

Questions, comments, and concerns that followed:

1. Tower – Au inquired and Alvin Sunahara from the Department of Information Technology (DIT) responded that the life cycle of towers is around 30 years, and the current deteriorating tower has been in place since 1978. Furthermore Sunahara answered that any additional dishes would be placed at the Hau'ula Fire Station to help maintain communication during a disaster and that there are ongoing discussions with the state whom may use space on the upgraded tower.
2. Sustainment – Tafua asked and Sunahara answered that the new tower has been designed to withstand winds of up to a Category Four (4) hurricane.

3. Set Back – Fonoimoana raised concerns about how close the tower is to a main thoroughfare, noting that in a case of a weather event and the tower were to go down, residents would be stuck in the area without means to get the tower off the road. Sunahara noted that they will ask the Department of Planning and Permitting (DPP) of any required setbacks from the road with communication towers and antennas. Sunahara answered that if the communication tower were to go down during a storm, Kahuku to Kaneohe would not be able to communicate with each other due to the break in communication loop.
4. Tower – Letts noted that the KCA approved the project for a replacement of existing tower, not for additional dishes. Sunahara noted that the tower has a capability to hold up to five (5) dishes but there are only plans to place three (3) dishes at the replacement tower.
5. Tower – Chair Moore asked and Sunahara answered that the tower would be heavy, and that the steel would be painted like the old tower with an off green color.
6. Cars – Iseke inquired and Sunahara answered that the tower would still stand if a car were to crash into it.
7. Clearing The Road – Kaneaukua with HFD communications noted in response to Fonoimoana that people at the Ka'a'awa Fire Station to the Kahuku Fire Station are outfitted with gas saw blades which could quickly cut up and remove a communication tower if fallen on the road after it was desensitized.
8. Safety – Lieutenant Asing noted the importance of getting a replacement communication tower placed in Ka'a'awa to help the first responders better help the community at large. Lieutenant Asing stated that HPD is 100% behind this project.
9. Timing – Chair Moore inquired and Mau answered that there is quite a long process ahead before the tower gets built, noting that bidding of the project needs to take place after the SMA is issued.
10. Notification – Fonoimoana asked and Mau noted that they are required to notify residents that are within 500 feet of the project.
11. Fence – Nihipali asked and Mau answered that there will be a chain length fence around the communication tower.
12. Additional Dishes – Miller inquired and Mau responded that she will make a note to the City requesting if any additional dishes are to be placed at the communication tower to please inform the community beforehand. Velasco noted that he will inform the community.

Letts moved, and Fonoimoana seconded to support the replacement of the Ka'a'awa Communication Tower as it stands with the three (3) microwave dishes. The motion passed UNANIMOUSLY by a voice vote, 9-0-0 (AYE: Anae, Au, Auna, Fonoimoana, Letts, Miller, Moore, Nihipali, and Tafua; **NAY:** None; **ABSTAIN:** None**).**

GOVERNMENT REPORTS

Mayor Kirk Caldwell – Adam Lefebvre was unable to attend the meeting, a memo for the record was provided. Letts read the following:

- Preparedness – The Department of Emergency Management (DEM) reports that the island of Oahu has many vulnerabilities from natural hazards, particularly in the coastal areas with limited options for access. While the City and the State will make every effort to quickly reopen roads after a disaster, DEM also count on individuals and communities to prepare themselves for the possibility of extended periods of disruption. DEM encourages everyone to make a plan and make an emergency supply kit to enable themselves to survive for at least seven (7) days. Keep in mind that roadway access into the community may only be part of the problem. Much of our supply-chain infrastructure is coastal areas that could also get affected by the same hazards. Emergency preparedness is not only a government responsibility but also an individual responsibility. There are opportunities for Oahu residents to work with community based groups in this effort. Specifically the Ko'olauloa area, has the following group: Hau`ula Emergency Leadership Preparedness (HELP) Committee, point of contact (POC) Burt Greene; 778-6864; greeneb002@hawaii.rr.com
- Homeless At Bus Stops – The Department of Transportation Services (DTS) notes that there are no formal plans in place "to stop homeless from sleeping at bus stops". However, DTS continues to work with the Department of Facilities Maintenance (DFM) to relocate persons found to pose adverse health and safety impacts on the public by occupying bus shelters and bus stops. DTS has found that the installation of certain types of seating can be used to discourage people from sleeping at bus stops. For example, replacing open bench seating with individual stools or benches with built-in dividers discourages people from reclining across the length of the bench. However, the types of seating installed by DTS at bus stops will depend on a range of factors, including site conditions, ridership trends, and bus riders' needs.
- Illegal Vacation Rentals – The DPP responded that in the Ko'olauloa area, the Residential Code Enforcement Branch has one (1) assigned inspector to investigate Housing and Zoning Code complaints,

which include illegal Transient Vacation Units (TVUs) on residential-zoned properties. There is one (1) inspector to investigate apartment/condominium complaints of illegal TVUs.

- Point In Time (PIT) Count – The Office of Housing (HOU) states that the annual homeless PIT count is organized by Partners In Care. They are proactively planning for the surveying of the North Shore and Windward communities, especially due to the notice that the 2016 PIT count may not have been conducted as effectively. If you would like to participate in this year's PIT count, please check the PIT website at: http://www.partnersincareoahu.org/2017-point-time-count-oahu or email or call Jen Stasch at 808-543-2282 (Direct Line) jstasch@auw.org.
- Signage – DPP noted that the variance application for a wall sign that exceeded the maximum height and area was withdrawn by the applicant on Thursday, July 2, 2015. An eight (8)-foot square garden sign at a maximum height of five (5) feet three (3)-1/2 inches has been approved and completed. To date, there has been no other discussion for a taller sign at the Marriott.
- Hau'ula Fire Station
    - The HFD noted that the current Hau'ula Fire Station does not have a facility to house an Emergency Medical Services (EMS) unit. The design of the new Hau'ula Fire Station does not include a facility for an EMS unit. The decision for determining where EMS units are strategically placed around the island rests with the Honolulu Emergency Services Department (HESD).
    - The Department of Design and Construction (DDC) reports that: An EMS unit at the site is not being considered at this time. That would be a matter for future consideration by the HFD and the HESD based on operational requirements, resource allocation, and funding. Walkability Issues on street frontages: Other than standard driveway improvements, the current plans for the fire station do not include any improvements in the State of Hawaii right-of-way along Kamehameha Highway and the City right-of-way along Kawaipuna Street. Traffic Light at Kawaipuna Street: A traffic light is not included in the scope of work for the new Hau'ula Fire Station project. But that does not preclude one (1) from being installed in the future. The decision to install a traffic light will be made based on further evaluation of need and impacts to the local and through traffic at that location.
- Neighborhood Board Elections – Candidate registration for the 2017 Neighborhood Board Elections has begun and the deadline to apply is Friday, February 17, 2017. Paper applications are available at the meeting or you may apply online at www.honolulu.gov/nco or at the Neighborhood Commission Office (NCO), located at 925 Dillingham Boulevard, Suite 160. More information on the boards and the election are also available on that site or by calling 768-3781.

Councilmember Ernie Martin – Mike Sakata reported the following: Point In Time (PIT) Count – Training took place yesterday, Wednesday, January 11, 2017 at the Queen Lili'uokalani Children's Center (QLCC) for the upcoming PIT count to take place, Monday, January 23 to Friday, January 27, 2017.

Questions, comments, and concerns that followed:

1. Bus – Connors asked if the bus could run every 30 minutes on the weekend. Sakata will look into this.
2. Assistant – Connors requested that money be appropriated for an assistant to Wailea Constantinau of the Honolulu Film Office.

State Senator Gil Riviere – Senator Riviere was unable to attend the meeting. Letts reported the following: Hearing – There will be a PUC hearing on Friday, February 2, 2017 at 6:30 p.m. at Kahuku High School regarding the Na Pua Makani wind turbines.

House Representative Sean Quinlan – 'Aukai Walk reported the following:

- Bills – Representative Quinlan is backing two (2) important bills. One (1) has to do with automatic voter registration, and the other is for a ban on oxybenzone found in sunscreen. If anyone has potential ideas/requests for bills please contact the office.
- La'ie Water Company – Walk provided a copy of the PUC Division of Consumer Advocacy's report on the La'ie Water Company, Inc. proposal for customer's water bill increases.
- Veteran's Memorial – Representative Quinlan will work closely with Councilmember Martin in finding an appropriate place for a veteran's memorial in the Ko'olauloa area.

Questions, comments, and concerns that followed:

1. Requests – Connors requests that Representative Quinlan looks towards a complete transportation system for the island with buses and the road system. Connors asked that if the film industry films out in the Ko'olauloa area that the money goes back to the local schools in the area.

2. Consumer Advocacy Report – Letts inquired as to who redacts the PUC consumer advocacy reports and what Protective Order No.33912 is on page 13 of the report provided. Walk will apprise the board of these answers at a later date.
3. Sidewalks – Anae noted that from Taco Bell to Windward Community College (WCC) there are no sidewalks for pedestrians to safely walk on, noting the importance of having a bus that goes all the way to the local college.
4. Infrastructure – Auna inquired and Walk answered that Representative Quinlan is on the Finance Committee and is looking for ways to redistribute money towards the Ko'olauloa side of the island for improvements, noting that Representative Quinlan does not have an official stance on Councilmember Anderson's position against the Malaekahana development.
5. Fees – Fonoimoana encouraged Representative Quinlan to look at ways to raises funds for this side of the island, with the possibility of charging a fee every time a rental car passes over sensors placed in the road. Walk will take these suggestions back.

Governor David Ige's Representative – No representative was present; a report was provided.

PUBLIC INPUT/COMMUNITY ANNOUNCEMENTS

1. Meeting Locations – Iseke inquired and Chair Moore and Letts answered that they are working out meetings to be held on the Ka'a'awa area.
2. Point In Time (PIT) Count – Connors encouraged everyone to participate in the PIT count, with training to take place on Wednesday, January 18, 2017 from 6:30 p.m. to 8:00 p.m. at the Hawaii Jisso Center.

ANNOUNCEMENTS

- Next Meeting – The next regular Ko'olauloa Neighborhood Board No. 28 meeting is scheduled for Thursday, February 9, 2017, 6:00 p.m. at the Kahuku Community Center, 56-576 Kamehameha Highway, Kahuku.
- 'Olelo Broadcasting – The regular Board meetings air on the 4th Friday at 9:00 p.m., and on the 2nd and 4th Sunday at 12:00 p.m. on Channel 49.

ADJOURNMENT: The meeting was adjourned at 7:49 p.m.

Submitted by: Sharon Baillie, Neighborhood Assistant I
Reviewed by: James Skizewski, Neighborhood Assistant I
Reviewed and Approved by: Verla Moore, Chair

Discussion of Kaaawa Fire Station Communications Facility Improvements and Tower Replacement Project highlighted in yellow below in Item 3(b)

KA`A`AWA COMMUNITY ASSOCIATION MEETING
DATE: Tuesday March 14, 2017
TIME: (7:00 – 8:30 P.M.)
LOCATION: KA`A`AWA ELEMENTARY SCHOOL

MINUTES - UNAPPROVED

1) Welcome
   a) Minutes of the Dec 13th meeting – reviewed and approved
   b) Treasurer's Report
      i) Current balance: $1113.35.
2) Community Reports
   a) Ka`a`awa Elementary School – Principal Jennifer Luke-Payne reporting
      i) 2nd annual Makahiki festival at the Ranch on Jan 20/21 went very well but very windy on the second day
      ii) 5k Fun run registration was closed because of too many entries (1700) – this is a very good thing!
   b) Neighborhood Board –no report
   c) HPD – no report
   d) Kualoa Ranch – Thor Kamakaala reporting
      i) The ranch is doing very well, now selling their own beef, oysters, fruit and veggies
      ii) They recently offered a gourmet meal at the ranch which was very successful
   e) Representative - Sean Quinlan's legislative Aide, Aukai Walk gave an update from Sean.
3) Old Business
   a) Andrea: update on Oahu Metropolitan Planning Organization (OMPO)
      i) There is a new hole in the Kam Hwy near Crouching Lion Inn
      ii) There will be upgrades to the rumble strip and striping starting in June
      iii) The Army Corps of Engineers did an inspection along Kam Hwy from Kaaawa to Hauula and identified several areas needing repairs.
   b) Proposed new communication tower at Fire Station – RM Towill: Laura Mau
      i) Discussed minor changes requested by the Koolauloa Neighborhood Board
      ii) Showed several minor changes to the plan such as a reduction of the number of dishes on the tower
      iii) KCA Board members reaffirmed their support for their plans
4) New Business
   a) Dotty Kelly-Paddock - Ko`olauloa Community Center
      i) Hauula is in the planning stage for a new Ko`olauloa Community Center in Hauula. It would have parking, perhaps a pool and would serve as a disaster shelter in the case of a hurricane or tsunami. She showed concept drawings and invited interested Ka`a`awa community members to join an Advisory Council composed of members from all Ko`olauloa communities.
      ii) They are writing a grant for doing an EA (Environmental Assessment)
   b) Announcement that Ocean Fest will be having their 6th annual event at Turtle Bay on Sat June 3rd – this time on the West lawn (near the stables)
   c) KBOA – Socrates Bratakos
      i) Gave an update on the status, responsibilities and activities of the KBOA, sometimes called the "beachowners association" whose members are primarily all property owners mauka of Kam Hwy and Kaneohe side of the fire station.
5) Announcements
   a) Next regular meeting: June 13, 2017

Meeting adjourned at 9:00pm

Laura Mau

From: Robert Domingo <hawaiianstyle@rocketmail.com>
Sent: Saturday, May 06, 2017 3:11 PM
To: Laura Mau
Subject: Re: Meeting Notes

Aloha Laura,

My apologies for missing your call today as I was in a meeting. In response to your clarification, I called Brian Walsh who took the minutes at the last meeting and he is out of town and won't be able to provide the minutes till he returns since they are hand written and at home.

Therefore, I am emailing to confirm with you that the Ka'a'awa Community Association approves the construction design of the Ka'a'awa Fire Station communication tower as presented and approved, as well as approve with minor design changes as you described at our last quarterly meeting.

Please let me know if this email is not sufficient for you to move forward as I hope that we do not hamper the process. Again mahalo for taking the time to discuss and disclose the plans with us.

Mahalo,
Robert Kealoha Domingo
KCA Chairman
(808)753-3132

On May 2, 2017, at 8:10 AM, Laura Mau <lauram@rmtowill.com> wrote:

> Mahalo Kealoha. I'll standby for the notes.
>
> Laura Mau, AICP
> Planning Project Coordinator
> mailto:lauram@rmtowill.com
>
> R. M. Towill Corporation
> 2024 North King Street Suite 200
> Honolulu, Hawaii 96819
> voice: 808 842 1133 fax: 808 842 1937 web: www.rmtowill.com
>
> ---
>
> **From:** Robert Domingo [mailto:hawaiianstyle@rocketmail.com]
> **Sent:** Monday, May 01, 2017 7:41 PM
> **To:** Laura Mau
> **Cc:** Brian Walsh
> **Subject:** Re: Meeting Notes
>
> Aloha Laura,
>
> I'm adding Brian to the email thread, I believe either he or his wife Kaye may have been taking minutes.
>
> Kealoha
>
> On May 1, 2017, at 6:36 PM, Laura Mau <lauram@rmtowill.com> wrote:

Aloha Kealoha,
Can you please forward the meeting minutes for Dec. 13, 2016 and Mar. 14, 2017?
Mahalo,
Laura

Laura Mau, AICP
Planning Project Coordinator
mailto:lauram@rmtowill.com

R. M. Towill Corporation
2024 North King Street Suite 200
Honolulu, Hawaii 96819
voice: 808 842 1133 fax: 808 842 1937 web: www.rmtowill.com

Laura Mau

From: Verla K. Moore <verlamoore@hawaii.rr.com>
Sent: Saturday, May 06, 2017 6:33 PM
To: Laura Mau
Subject: Re: Kaaawa Fire Station Communication Tower Replacement Project - CUP Minor

Aloha Laura,

I got your voicemail and tried calling you right back but I couldn't get through to your voicemail.

In response to your earlier email, which I thought I had answered, there is no need to comeback before our Ko'olauloa Neighborhood board because there was no opposition to the proposed Ka'a'awa Communication Tower and your team has adequately addressed any concerns/questions related to the project.

I hope this email will suffice for the now required CUP-Minor. Please call me if I can be of further assistance.

Verla Moore
Chair, Ko'olauloa NB
(808) 783-3743

Sent from my iPhone

On May 6, 2017, at 12:20 PM, Laura Mau <lauram@rmtowill.com> wrote:

> Hi Verla,
> I left a voice message on your cell to follow-up on the Kaaawa Fire Station Communication Tower Replacement Project. When you have a chance, can you please reply to my email below dated 4.29.17 confirming that a separate meeting before the Koolauloa Neighborhood Board will not be required for the Conditional Use Minor Permit?
> Please let me know if you have any questions.
> Mahalo,
> Laura
>
> Laura Mau, AICP
> Planning Project Coordinator
> mailto:lauram@rmtowill.com
>
> R. M. Towill Corporation
> 2024 North King Street Suite 200
> Honolulu, Hawaii 96819
> voice: 808 842 1133 fax: 808 842 1937 web: www.rmtowill.com
>
> ---
>
> **From:** Laura Mau
> **Sent:** Saturday, April 29, 2017 2:36 PM
> **To:** Verla Moore (verlamoore@hawaii.rr.com)
> **Subject:** Kaaawa Fire Station Communication Tower Replacement Project - CUP Minor
>
> Dear Verla,

On behalf of the City and County of Honolulu, Department of Information Technology (DIT), thank you again for the telephone call this week regarding the Kaaawa Fire Station Communication Tower Replacement project. Per our discussion, the project will require the approval of a Conditional Use Permit (Minor) by the City and County of Honolulu, Department of Planning and Permitting (DPP). As part of the CUP Minor pre-application preparation for transmitting antennas, DPP requires that the Applicant present the project to the neighborhood board of the district where the site is located, or community association if no such neighborhood board exists. This requirement is deemed to have been satisfied, however, if the neighborhood board (or community association, if applicable) confirms that a presentation was made and describing the position of the Board, or stating that such a presentation is not necessary.

This is to confirm our conversation that a separate presentation to the Koolauloa Neighborhood Board will not be necessary, given that the project was previously presented to the Board on January 12, 2017, as well as the Kaaawa Community Association on December 13, 2016 and March 14, 2017. The purpose of the presentations was to support the anticipated environmental assessment exemption. Following these presentations, the project remains the same with the exception of minor changes to address concerns expressed during the presentations.

As recommended, I contacted Mr. Kealoha Domingo, president of the Kaaawa Community Association to ask if a separate presentation would be needed for the CUP. Mr. Domingo responded that such a presentation was unnecessary.

Respectfully, on behalf of DIT I'm requesting your response to this email affirming our conversation.

Please let me know if you have any questions or require more information.

Mahalo,
Laura

Laura Mau, AICP
Planning Project Coordinator
mailto:lauram@rmtowill.com

R. M. Towill Corporation
2024 North King Street Suite 200
Honolulu, Hawaii 96819
voice: 808 842 1133 fax: 808 842 1937 web: www.rmtowill.com

APPENDIX F

Declaration of Exemption
by City and County of Honolulu
Department of Information Technology and
Department of Design and Construction
Approved October 12, 2017

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
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June 28, 2017

MEMORANDUM

TO: RECORD

FROM: DEPARTMENT OF INFORMATION AND TECHNOLOGY
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: **DECLARATION OF EXEMPTION** from the preparation of an Environmental Assessment under Hawaii Revised Statutes, CHAPTER 343

PROJECT: Kaaawa Fire Station Communication Facility Improvements and Tower Replacement

PROJECT NO.: II-22-15-C

A. PROJECT DESCRIPTION

The City and County of Honolulu (City) Department of Information and Technology (DIT) and the Department of Design and Construction (DDC) are proposing to replace the existing 100-foot (ft.) tall three-sided, self-supporting lattice communications tower in Kaaawa. The project site is located adjacent to the Kaaawa Fire Station (No. 21) at 51-518 Kamehameha Highway in Kaaawa, and is identified by Tax Map Key (1) 5-1-011: 051. A new 120-ft. tall, four-sided, self-supporting tower will replace the existing tower, and will be located on the same project site, immediately makai of the existing tower. In addition, to support the functions of the new communications tower, the existing equipment building will be renovated and the existing shed that houses the emergency generator will be replaced with a new building.

The tower is one of 15 tower sites that comprise the City's communications infrastructure, which provides the island-wide land mobile radio (LMR) communications for critical emergency and public service providers, including the Honolulu Fire Department, Honolulu Police Department, and TheBus. In addition, the existing communications tower provides the only radio communications connection between Kahuku and Aikahi. Therefore, implementation of the proposed improvements is critical to ensuring the continued reliability of the communication system for the community.

In November 2014, a tower repair report was conducted by Tower Engineering Company to evaluate the structural integrity of the existing tower (see enclosed Record of Supporting Documents Exhibit A). The evaluation indicated that structural members

throughout the tower were at advanced stages of deterioration. Short-term, temporary repairs have since been performed on the tower, however, the tower is recommended for replacement as a long-term solution.

Construction is anticipated to begin late 2017, contingent on the receipt of all permits and approvals, and will take approximately 10 months to complete. The estimated project cost is $3.8 million, which will be funded by the City. No federal funds will be used for the improvements.

B. HAWAI'I REVISED STATUTES CHAPTER 343 TRIGGER

HAR, Section 343-5(a)(1): Use of public lands and funds.

C. QUALIFYING STATEMENT FOR EXEMPTION

The DIT and DDC have determined that the Kaaawa Fire Station Communication Facility Improvements and Tower Replacement Project No. II-22-15 is consistent with the following classes of action in the DDC Comprehensive Exemption List, reviewed and concurred to by the Environmental Council on May 10, 2016. The following provides the rationale based on the Comprehensive Exemption List for the exclusion of the subject project from the applicability of HRS, Section 343-5(a)(1), and HAR, Section 11-200-5(c):

- *Exemption Class #1: Operations, repairs or maintenance of existing structures, facilities, equipment or topographical features involving negligible or no expansion or change of use beyond that previously existing.*

  - *Item 17. Construction staging areas, temporary*

  - *Item 21. Essential utilities, including but not limited to, wastewater systems, drainage systems, water systems, electrical systems, communication systems, SCADA systems, and fuel systems, except where a State Department of Health permit is required*

  Comment:
  The proposed project involves the replacement or renovation of existing facilities and will not result in the expansion or change of use beyond the existing use. The construction work to implement the project will require temporary on-site construction staging areas.

- *Exemption Class #2: Replacement or reconstruction of existing structures and facilities where the new structure will be located generally on the same site and will have substantially the same purpose, capacity, density, height, and dimensions as the structure replaced.*

  - *Item 22. Essential utilities, including but not limited to, wastewater systems, drainage systems, water systems, electrical systems, communication*

    systems, irrigation systems, and fuel systems except where a State Department of Health permit is required

  Comment:
  The existing tower is an essential to Oahu's emergency communications infrastructure. The replacement tower will be located immediately makai of the existing tower, and will have the same purpose and capacity, height, and dimensions as the structure replaced. The new tower will be slightly larger than the existing tower to meet current design and operational standards.

- *Exemption Class #3: Construction and location of single, new, small facilities or structures and the alteration and modification of the same and installation of new, small, equipment and facilities and the alteration and modification of same, including but not limited to:*

  d. Water, sewage, electrical, gas, telephone, and other essential public utility services extensions to serve such structures or facilities; accessory or appurtenant structures, including garages, carports, patios, swimming pools, and fences; and acquisition of utility easements.

  - *Item 28. Equipment installations, including but not limited to pumps; motors; electrical transformers, cabinets, panels, and vaults; power, light, and telephone pole systems; heating, ventilation, and air conditioning (HVAC); irrigation controllers; telephone stations; emergency electrical generators; elevators; and lifts provided for handicapped accessibility*

  - *Item 22. Essential utilities and new, small equipment, including but not limited to wastewater systems, drainage systems, water systems, electrical systems, communication systems, and irrigation systems*

  Comment: The renovation of the existing equipment building, replacement of the existing shed which houses the emergency electrical generator, replacement of security chain link fencing and integration of a new, 27-inch concrete wall, construction of a new concrete pad to support the existing propane tank, and replacement of existing fuel lines. These appurtenant improvements are considered to be minor, yet essential for the operation of the tower.

D. CONSULTED PARTIES

The State of Hawaii, Department of Land and Natural Resources, State Historic Preservation Division (SHPD) was consulted on May 5, 2015 during a meeting with Cultural Surveys Hawaii, to determine the appropriate level of archaeological research required for the project. During the meeting, the SHPD indicated that an archaeological inventory survey (AIS) would be required and an AIS was subsequently prepared in August 2016 (see Exhibit B). No subsurface historic properties or cultural resources were identified on the project site and no further archaeological mitigation is

recommended. Because no historic properties were identified, the investigation was termed an archaeological assessment (AA), per HAR §13-13-275-5(b)(5)(A), which states, "*Results of the survey shall be reported either through an archaeological assessment, if no sites were found, or an archaeological survey report which meets the minimum standards set forth in chapter 13-276-5.*" The AA was submitted to SHPD on September 28, 2016 and is currently under review.

On September 19, 2016, DIT consulted with the City Department of Planning and Permitting (DPP) regarding the proposed project. The DPP confirmed that the project is subject to a Special Management Area (SMA) Major Permit, pursuant to Hawaii Revised Statutes Chapter 205(A) and Revised Ordinances of Honolulu, Chapter 25. Thus, a SMA Major Permit will be sought for the project. Notably, no adverse impacts are anticipated upon the area defined within the SMA as a result of the proposed project. In addition, the proposed project is deemed herein to be eligible for exemption under HRS 343 and, as such, this exemption will be used to support the SMA application.

In addition, presentations of the proposed project were made at regularly scheduled meetings of the Kaaawa Community Association (KCA) and Koolauloa Neighborhood Board No. 28 (KNB) as follows:

a. December 13, 2016 - Presentation to the KCA. No significant comments were received, and a motion to support the project was passed. See meeting minutes in Exhibit C.

b. January 12, 2017 - Presentation to the KNB. Several questions were asked by the board members and addressed by the project team, however, none were in opposition to the project. Concern was expressed about the possibility of an accidental vehicular impact to the tower, and whether the structural design could sustain such impact. In response to the concern, following the meeting, the design plans were modified to incorporate a 27-inch concrete wall with the chain link fence around the perimeter of the new tower to provide added protection against an inadvertent vehicular accident. In addition, the Honolulu Police Department expressed strong support for the project. The DIT committed to

informing the community prior to the installation of additional microwave dishes. The KNB voted unanimously in support of the project. See meeting minutes in Exhibit D.

c. March 14, 2017 – Presentation to KCA. A second presentation was provided as a follow-up to the KNB meeting. Design modifications were presented, including the 27-inch concrete wall integrated with the perimeter chain link fence surrounding the new tower. Additional photographic simulations of the existing and proposed towers were also presented. The KCA had no significant comments and reaffirmed their support for the project. See meeting minutes in Exhibit E.

E. EXEMPTION DECLARATION

The direct, cumulative, and potential impacts of the action described above have been considered pursuant to HRS, Chapter 343 and HAR, Chapter 11-200. I declare that the action described above will leave minimal or no significant impact on the environment and is therefore exempt from the preparation of an environmental assessment.

Mark D. Wong, Director
Department of Information Technology
City and County of Honolulu

10/12/2017
Date

Robert J. Kroning, Director
Department of Design and Construction
City and County of Honolulu

7/5/17
Date

RJK:ln

Enclosure