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OCT 08 2018

DAVID Y. IGE
GOVERNOR

CRAIG K. HIRAI
EXECUTIVE DIRECTOR

In reply, refer to:

18:DEV/140

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
HAWAII HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
FAX (808) 587-0600

September 24, 2018

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

Dear Director Glenn:

Re: Second Draft Environmental Assessment for Ililani at Kakaako, Oahu, Hawaii (Tax Map Key: 2-1-051:011 and 012)

With this letter, the Hawaii Housing Finance and Development Corporation (HHFDC) hereby transmits the second draft environmental assessment and anticipated finding of no significant impact (Second DEA-AFNSI) for the Ililani condominium project situated at Kakaako, Tax Map Keys: (1) 2-1-051: 011 and 012, in the Honolulu District on the island of O'ahu for publication in the next available edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form, two copies of the Second DEA-AFNSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

Please contact Genoa Ward (HHFDC) at (808) 587-0546, or our consultant, Mr. Keola Cheng at (808) 946-2277 or kcheng@wilsonokamoto.com if you have any questions.

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'18 SEP 35 P10:48
OFC. OF ENVIRONMENTAL QUALITY CONTROL

Sincerely,

Craig K. Hirai
Executive Director

Enclosures

19-098

APPLICANT
PUBLICATION FORM

Project Name:	Ililani
Project Short Name:	Ililani
HRS §343-5 Trigger(s):	Use of State Lands/Funds
Island(s):	Oahu
Judicial District(s):	Honolulu
TMK(s):	2-1-051: 011 and 012
Permit(s)/Approval(s):	Hawai'i Revised Statutes §201H-38
Approving Agency:	Hawai'i Housing Finance & Development Corporation
Contact Name, Email, Telephone, Address	Genoa Ward, genoa.j.ward@hawaii.gov, (808) 587-0546, 677 Queen Street Honolulu, Hawaii 96813
Applicant:	Ililani LLC
Contact Name, Email, Telephone, Address	Henry Chang, changh11@gmail.com, 1860 Ala Moana Blvd #1000 Honolulu, Hawai'i 96822
Consultant:	Wilson Okamoto Corporation
Contact Name, Email, Telephone, Address	Keola Cheng, kcheng@wilsonokamoto.com, 808-946-2277, 1907 South Beretania Street, Suite 400 Honolulu, Hawaii 96826

Status (select one)	**Submittal Requirements**
____ DEA-AFNSI	Submit 1) the approving agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.
____ FEA-FONSI	Submit 1) the approving agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.
____ FEA-EISPN	Submit 1) the approving agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.
____ Act 172-12 EISPN ("Direct to EIS")	Submit 1) the approving agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.
____ DEIS	Submit 1) a transmittal letter to the OEQC and to the approving agency, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.
____ FEIS	Submit 1) a transmittal letter to the OEQC and to the approving agency, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.
___ FEIS Acceptance Determination	The approving agency simultaneously transmits to both the OEQC and the applicant a letter of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS; no comment period ensues upon publication in the Notice.
____ FEIS Statutory Acceptance	The approving agency simultaneously transmits to both the OEQC and the applicant a notice that it did not make a timely determination on the acceptance or nonacceptance of the applicant's FEIS under Section 343-5(c), HRS, and therefore the applicant's FEIS is deemed accepted as a matter of law.

____ Supplemental EIS Determination	The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.
____ Withdrawal	Identify the specific document(s) to withdraw and explain in the project summary section.
__X_ Other	Second DEA-AFNSI

Project Summary
Provide a description of the proposed action and purpose and need in 200 words or less.

Ililani is envisioned as a mixed-use development offering approximately 328 affordable and market-rate for sale residential units in a 41 story tower with retail space on the 1st floor (42-stories total). The project, located in Kakaako, includes an eight-story parking structure plus a recreational deck on the 9th floor. One of the rail transit stations proposed by the Honolulu Authority for Rapid Transportation (HART) will be located on the 'Ewa side of the building along Halekauwila Street within 130 yards of the site.

During the preparation of the Draft Environmental Assessment, which was published on February 8, 2018, several underground storage tanks were discovered by project archeologists. An environmental consultant (Masa Fujioka and Associates) was contracted and instructed to remove the subject tanks to allow the archeologists to continue their work. No holes or leaks were found in the tanks. However, the presence of lead was found in the soils in the vicinity of the tank during standard required soil testing. These findings were documented in a January 15, 2018 UST closure report which was not available during the preparation of the original Draft EA document. Pursuant to the findings of this UST closure report, Masa Fujioka and Associates was tasked with the preparation of an Environmental Hazard Evaluation and Environmental Hazard Management Plan, which is included herein as an appendix to the Second Draft EA. Disclosure of these Environmental Hazard documentation efforts necessitated the preparation of this Second Draft EA document.

19-098

Ililani
Second Draft Environmental Assessment

October 2018

Prepared For:

Ililani LLC

Prepared By:

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

DAVID Y. IGE
GOVERNOR

CRAIG K. HIRAI
EXECUTIVE DIRECTOR

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STATE OF HAWAII
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Sincerely,

Craig K. Hirai
Executive Director

Enclosures

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Appendix B Pre-Assessment Consultation Comment Letters, List of Consulted Cultural Descendants and Responses, & Draft EA/201H Comments

Appendix C Pedestrian Wind Consultation Study

Appendix D Environmental Hazard Evaluation (EHE) and Environmental Hazard Management Plan (EHMP) Ililani LLC Revised July 10, 2018, Version 2: Final

Appendix E State of Hawai‘i Department of Health No Further Work Authorization Letter

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PREFACE

This Second Draft Environmental Assessment (EA) / Anticipated Finding of No Significant Impact (AFNSI) has been prepared pursuant to Chapter 343, Hawaiʻi Revised Statutes (HRS), and Title 11, Chapter 200, Hawaiʻi Administrative Rules (HAR), Department of Health, State of Hawaiʻi.

This EA is required because of the proposed use of state funds and possible use of state land. The applicant is Ililani LLC, and the document will be processed for acceptance as a Final EA/Finding of No Significant Impact (FONSI) by the Approving Agency, the State of Hawaiʻi Department of Business, Economic Development and Tourism's (DBEDT), Hawaiʻi Housing Finance and Development Corporation (HHFDC), which will also be responsible for determining if the Final EA can be filed as a Finding of No Significant Impact (FONSI).

During the preparation of the Draft Environmental Assessment, which was published on February 8, 2018, two underground storage tanks were discovered by project archeologists. An environmental consultant (Masa Fujioka and Associates) was contracted and instructed to remove the subject tanks to allow the archeologists to continue their work. No holes or leaks were found in the tanks. However, the presence of lead was found in the soils in the vicinity of the tank during standard required soil testing. These findings were documented in a January 15, 2018 UST closure report which was not available during the preparation of the original Draft EA document. Pursuant to the findings of this UST closure report, Masa Fujioka and Associates was tasked with the preparation of an Environmental Hazard Evaluation and Environmental Hazard Management Plan, which is included herein as an appendix to the Second Draft EA (see Appendix D). Disclosure of these Environmental Hazard documentation efforts necessitated the preparation of this Second Draft EA document.

A Traffic Impact Report and Pedestrian Wind Consultation Study have been prepared in conjunction with this EA and are included herein as appendices.

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SUMMARY

Applicant:	Ililani LLC
Approving Agency:	State of Hawai‘i Department of Business, Economic Development, and Tourism – Hawai‘i Housing Finance and Development Corporation
Location:	Kaka‘ako, O‘ahu, Hawai‘i
Tax Map Keys (TMK):	2-1-051: 011 and 012
Recorded Fee Owner:	Kam Development LLC
Existing Use:	Single-Story Commercial Building
State Land Use Classification:	Urban
Zoning:	Administered by HCDA as part of the Kaka‘ako Community Development District. The project site is located in the Mauka Area Plan’s “Pauahi Neighborhood” and designated “mixed-use urban village.”
Proposed Action:	Ililani is envisioned as a mixed-use development consisting of approximately 328 affordable and market-rate for sale residential units in a 41 story tower with retail space on the 1st floor (42-stories total). The project includes an eight-story parking structure plus a recreational deck on the 9th floor. One of the rail transit stations proposed by the Honolulu Authority for Rapid Transportation (HART) will be located on the ‘Ewa side of the building along Halekauwila Street within 130 yards of the site.
Impacts:	Potential soil erosion and associated water quality impacts will be mitigated by applying required best management practices to control soil erosion and siltation. No significant impacts on flora and fauna are anticipated as a result of construction or operation of the project. It is anticipated that no historic properties will be affected by the proposed project. Air quality, noise and hazardous materials impacts will be mitigated by compliance with applicable Department of Health rules. Traffic operations in the vicinity of the project site are expected to remain similar to conditions without the proposed project. As such, the proposed project is not expected to have a significant impact on surrounding roadways. No significant impacts regarding water, wastewater, drainage, electrical and communications systems are anticipated.

Anticipated Determination: Anticipated Finding of No Significant Impact (AFNSI)

Parties Consulted During Pre-Assessment:

Federal Agencies
National Oceanic and Atmospheric Administration, Pacific Islands Regional Office
U.S. Department of the Interior, Fish and Wildlife Service
Federal Aviation Administration
U.S. Army Corps of Engineers

State Legislative Branch
Senator Brickwood Galuteria
Representative Scott Saiki

State Agencies
Department of Accounting and General Services
Department of Business, Economic Development and Tourism
Department of Business, Economic Development and Tourism, Energy Office
Department of Business, Economic Development and Tourism, Land Use Commission
Department of Business, Economic Development and Tourism, Office of Planning
Department of Defense
Department of Defense, State Civil Defense
Department of Education
Department of Health
Department of Health, Clean Water Branch
Department of Health, Environmental Management Division
Department of Health, Environmental Planning Office
Department of Land and Natural Resources
Department of Land and Natural Resources, Historic Preservation Division
Department of Transportation
Hawai‘i Community Development Authoritity
Office of Environmental Quality Control
Office of Hawaiian Affairs
University of Hawai‘i at Mānoa Environmental Center

City Council
Councilmember Ann Kobayashi
Councilmember Carol Fukunaga

City and County of Honolulu Agencies
Board of Water Supply
Department of Community Services
Department of Design and 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

Utility Companies
Verizon Hawai‘i
Hawai‘i Gas
Hawaiian Electric Company, Inc.
Hawaiian Telcom
Spectrum

Other Interested Parties and Individuals
Ala Moana/Kaka‘ako Neighborhood Board No. 11

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1. INTRODUCTION

Ililani LLC is proposing to develop the Ililani project, and is applying to the Hawai‘i Housing Finance and Development Corporation (HHFDC) for qualification under Chapter 201H, Hawaii Revised Statutes (HRS), along with proposed exemptions from statutes, rules and ordinances pursuant to Section 201H-38, HRS.

Since the project is proposing the use of State funds (for construction from the HHFDC's Dwelling Unit Revolving Fund) and contemplates the use of state land for additional parking space, it is subject to Chapter 343, HRS, referred to as the Hawai‘i EIS Law. In compliance with Chapter 343, HRS and implementing Hawai‘i Administrative Rules Title 11, Chapter 200, the HHFDC will be the approving agency responsible for processing the EA for this "applicant action".

During the preparation of the Draft Environmental Assessment, which was published on February 8, 2018, two underground storage tanks were discovered by project archeologists. An environmental consultant (Masa Fujioka and Associates) was contracted and instructed to remove the subject tanks to allow the archeologists to continue their work. No holes or leaks were found in the tanks. However, the presence of lead was found in the soils in the vicinity of the tank during standard required soil testing. These findings were documented in a January 15, 2018 UST closure report which was not available during the preparation of the original Draft EA document. Pursuant to the findings of this UST closure report, Masa Fujioka and Associates was tasked with the preparation of an Environmental Hazard Evaluation and Environmental Hazard Management Plan, which is included herein as an appendix to the Second Draft EA (See Appendix D). Disclosure of these Environmental Hazard documentation efforts necessitated the preparation of this Second Draft EA document.

This Draft EA documents the exemptions and deferrals requested under Chapter 201H for agency/public review and comment in Chapter 8, and serves as the Chapter 201H, HRS, application agency/public comment document. The complete 201H application is on file with the HHFDC.

1.1 Project Location

The project will be located on a portion of a block within the Mauka Area of the Kaka‘ako Community Development District (KCDD). The project site is bounded by Keawe Street to the northwest, an existing building to the southwest, Halekauwila Street to the south, and a existing building to the northeast (See Figure 1-2). The project site is comprised of two Tax Map Key (TMK) parcels, the first of which is 2-1-051:011, an approximately 0.77 acre parcel currently occupied by a vacant, single-story commercial building along the parcel's Halekauwila frontage. The second TMK parcel, 2-1-051:012, encompasses an area of approximately 0.23 acres and is also occupied by a single-story commercial structure.

1.2 Existing and Surrounding Uses

The project site is currently occupied by several single story commercial structures. Existing surrounding uses include 609 Keawe Street, which is adjacent to the northwest and houses Dive Oahu. Also adjacent to the northwest of the project site and South of Dive Oahu is 670

Halekauwila Street, housing Honolulu Bimmer (an auto repair shop specializing in vehicles of BMW make). Adjacent to the northeast at 677 Queen Street is Pohulani Elderly Apartments, Hawai‘i Department of Human Services – Child Care Licensing, and HHFDC. Adjacent to the south are several small businesses, including Akona Golf and Rainbow Beauty Supply. Several warehouses and paved surface parking lots are located across of the project site along Keawe Street.

1.3 Surrounding Planned Development

The project site is within the Mauka Area of the Kaka‘ako Community Development District (KCDD), which is bounded by Punchbowl Streeet, South King Street, Piikoi Street, and Ala Moana Boulevard and is undergoing rapid transformation. The KCDD is located on the southern shore of the island of O‘ahu, and lies between Waikīkī and the Downtown/Capitol District. It is divided into “Mauka” and “Makai” areas, each with a governing plan and set of rules that supercede City and County of Honolulu zoning.

The KCDD Mauka Area Plan designates neighborhoods that recognize distinct variations in land use and urban form, and provides a framework for realizing unique neighborhoods with a special sense of place and identity. The project site is located on the edge of the “Pauahi” Neighborhood Zone, which is planned to be a mixed-use “urban village”. The Site is surrounded by parcels entitled to be developed to an allowable maximum height of 400 feet.

Approximately 29 acres of the Pauahi Neighborhood have been planned by landowner Kamehameha Schools’ Kaiāulu ‘O Kaka‘ako Master Plan (“KKMP”). The KKMP envisions Cooke Street as a landscaped corridor with pocket parks, courtyards, public gardens and playgrounds, and which will link the Mother Waldron Neighborhood Park to Makai Gateway Park across Ala Moana Boulevard, leading to Kaka‘ako Waterfront Park.

The site is positioned to be transit-oriented, and will benefit from accessibility to local transit systems including the City’s bus system and the future Honolulu Authority for Rapid Transportation (HART) rail line. It is in proximity to the planned Civic Center rail station, located less than a block away (approximately 130 yards from the site) on the other side of Halekauwila Street. The elevated rail guideway will run adjacent to the site, passing along Halekauwila Street. The guideway is planned to offer pedestrian and bicycle facilities beneath it. The Mauka Area Plan identifies the surrounding surface street network as a “Pedestrian Supportive Environment” where infrastructure and land use attracts recreational walkers and joggers

1.4 Land Ownership

The project site is owned by Kam Development LLC. The applicant, Ililani LLC is a development entity formed by Hui O Ka La, LLC and Ililani Capital, LLC. Hui O Ka La, LLC has an option to acquire the property from the landowner, and has assigned said option to Ililani LLC.

WILSON OKAMOTO CORPORATION

ILILANI TOWER

LOCATION MAP

Figure No.

1-1

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2. PROJECT DESCRIPTION

2.1 Purpose and Need

The Hawaiʻi State Legislature created the Hawaiʻi Community Development Authority (HCDA) in 1976 to plan, regulate and implement the redevelopment of specially designated community development districts in the State of Hawaiʻi - including 600-acres in the Kakaʻako Community Development District ("KCDD") located within Honolulu's primary urban core. The KCDD is currently undergoing major redevelopment, with many projects under construction or approved to start construction, and more proposed developments in review. This redevelopment is incrementally realizing planned goals for Smart Growth through urban infill of mixed-use neighborhoods.

The HCDA has adopted a revised Mauka Area Plan which identifies the need for a mix of housing options, including residential development that offers different densities, building types, and configuration in accordance with appropriate urban design guidelines; integration both vertically and horizontally of residents of varying incomes, ages, and family groups; and, an increased supply of housing for residents of low or moderate income. Furthermore, it is expected that residential development will provide necessary community facilities, such as open space, parks, community meeting places, child care centers, and other services, within and adjacent to residential development.

The Ililani high-rise tower in Kakaʻako will consist of 328 residential for-sale units, of which 50 percent plus 1 unit, or 165 units, will be affordable and the remaining 163 units will be sold at market rate. In addition, there will be ground floor commercial, managed parking, and a recreation deck above the parking. The project application will be subject to 201H housing rules adopted by the Hawai'i Housing Finance & Development Corporation. It is aligned with the mission of creating an affordable, livable urban residential community for Hawaii's working families.

2.2 Proposed Project

The Ililani is envisioned as a mixed-use development offering a mix of both affordable and market residential units. Encompassing 328 units, Ililani will be constructed as a 41-story tower with ground floor retail spaces (42-stories in all), including an eight-story parking structure with an approximately 12,000 s.f. rooftop recreation deck that includes AOAO garden boxes that apartment owners can bid for to grow food plants, and 2,800 s.f. of internal recreational rooms (See Figures 2-1, and 2-2). Ililani is planned to feature two unit types, the first being a two-bedroom 870 square foot (s.f.) unit with a lanai, and the second being a smaller one-bedroom, 590 s.f. unit with a lanai.

Ililani presents a unique opportunity to redefine what a mixed - use, mixed - income affordable housing development can provide to lower and moderate income residents of Hawaiʻi. Ililani will cultivate a community living experience for residents through the creation of social spaces and amenities paired with modern accommodations.

Approvals for Ililani will be processed under Chapter 201H, HRS, which allows for greater design flexibility and cost savings to facilitate the development of affordable housing. This is achieved by allowing exemptions from certain statutes, ordinances, charter provisions, and rules related to planning, zoning and construction.

Ililani consists of a mix of for sale residential units. The applicant has committed to set-aside units based on the income restrictions listed in Table 2-1 below.

TABLE 2-1: AFFORDABLE UNIT MIX

Affordable Units		
Restricted at % of AMGI*	Number of units	Percent of total units
80% of AMGI	33 units	10.1 %
100% of AMGI	33 units	10.1 %
120% of AMGI	50 units	15.2 %
140% of AMGI	49 units	14.9 %
Total Affordable Units	**165 units**	50.3%
Market Rate Units	163 units	49.7 %
Total Number of Units	**328 units**	100 %
BR/BA mix	2BR/2BA 197 units, 1BR/1BA 131 units	
Approximate unit sizes (including lanai):	2BR/2BA 870 s.f., 1BR/1BA 590 s.f.	
Estimated sales prices (in 2017$):	2BR/2BA $600k to $900k 1BR/1BA $300k to $600k.	
Residential amenities:	Recreation deck (12,000 s.f.) with putting green, gas barbeque grills, and AOAO gardening planters. Recreation room (2,800 s.f.), Lobby entrance, and Bicycle parking.	
Types of retail uses:	Potential restaurant, sundry store, fast /casual dining establishment	

*AMGI = Average Median Gross Income

2.3 CONSTRUCTION COST AND SCHEDULE

The development of the proposed Ililani is anticipated to commence in January 2019. Construction is anticipated to span 24 months. The estimated cost of construction for the proposed project is $108 million.

WILSON OKAMOTO CORPORATION

ILILANI TOWER

RENDERED VIEW

Figure No.

2-1

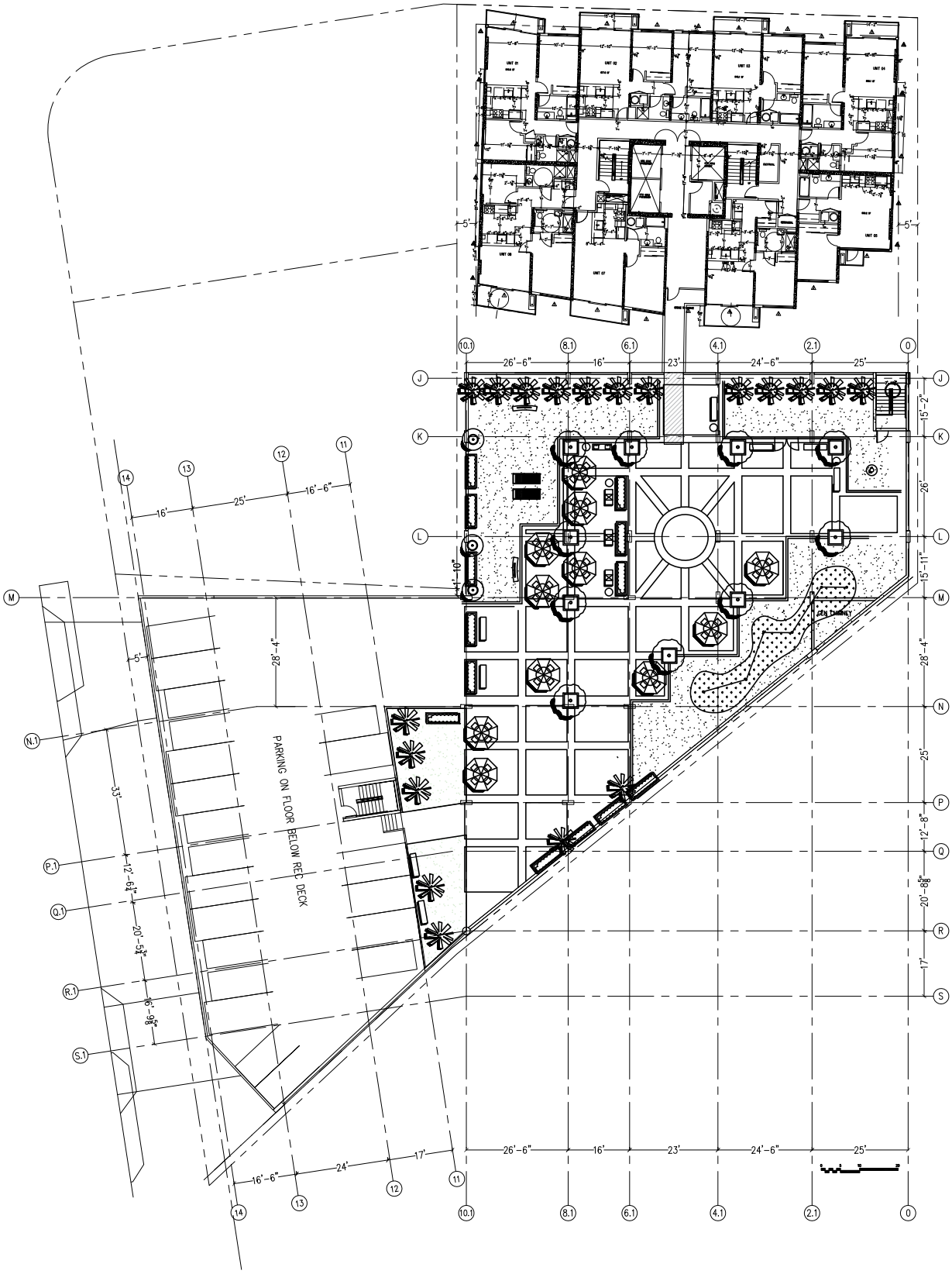

FIGURE 2-2
PLAN CONCEPT

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

3.1 Climate

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

The project is located in the Honolulu area which has a climate typical of the leeward coastal lowlands of O‘ahu. The area is characterized by abundant sunshine, persistent trade winds, relatively constant temperatures, moderate humidity, and the infrequency of severe storms. Northeasterly trade winds prevail throughout the year although its frequency varies.

The mean temperature measured at Honolulu International Airport ranges from 70 degrees Fahrenheit in the winter to 84 degrees Fahrenheit in the summer. Average annual precipitation is measured at approximately 30 inches, with rainfall occurring mostly between October and March.

Over the 20th Century, the average temperatures of the Earth’s surface and shallow ocean have increased (Fletcher 2010). These changes are largely attributed to the release of greenhouse gases (GHGs) into the atmosphere, so-called as they absorb and “trap” solar radiation instead of reflecting it back into space. Generally speaking, GHGs include carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons.

The main sources of GHG emissions resulting from human activity are from the following sectors, in order from most emissions to least: fossil fuel power stations, industrial activity, transportation, agriculture, fossil fuel processing, residential and commercial activity, land use and biomass burning, and waste disposal and treatment. In 2007, the United States was responsible for approximately 20% percent of global carbon dioxide emissions (WRI 2010). Within the state of Hawai‘i the island of O‘ahu accounts for approximately 80% percent of the state’s total carbon dioxide emissions (ICF 2008). Hawai‘i’s GHG emissions encompass less than 1% percent of the national total, as of 2007 (Environmental Protection Agency [EPA] 2008).

Impacts and Mitigation Measures

No significant impacts on climate in the project area are anticipated. Based on the findings of the Pedestrian Wind Consultation Study prepared by RWDI Inc. in December 2017 (See Appendix C), the project meets all applicable wind comfort and safety criterions. Consequently, construction and operation of proposed project improvements are not anticipated to affect temperatures, wind, or rainfall levels in the project area.

The implementation of the proposed action will result in the short-term irrevocable release of GHGs from construction activities associated with the development of the proposed project improvements. The quantities of GHGs released, however, will be negligible. No mitigation is required or proposed.

3.2 Physiography

3.2.1 Geology and Topography

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

The project site is located on the Kaka‘ako Peninsula which lies on the Honolulu Plain, a narrow coastal plain along O‘ahu’s south central coast. The Honolulu Plain and much of the remaining southern edge of O‘ahu is underlain by a broad elevated coral reef, which is covered by alluvium carried down from the mountains. The Honolulu Plain ranges in elevation from zero to ten feet.

According to the United States Geological Survey (USGS) 7.5-Minute Honolulu, O‘ahu, Topographic Quadrangle Map (1998), the elevation at the subject property is between 5 and 10 feet above mean sea level (amsl). The general topography of the subject property and surrounding region slopes down to the south, toward the Pacific Ocean.

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts on geology or topography are anticipated during construction or operation of the proposed project. Construction of proposed project improvements will not involve any major land disturbing activities involving mass grading or significant revisions to site contours. Applicable best management practices and erosion control measures will be implemented.

3.2.2 Soils

According to the U.S. Department of Agriculture, Natural Resource Conservation Service, soils within the project site are mostly classified as Fill Land, Mixed (FL) (see Figure 3-1). Soil series are classified as “man-made”, well-drained, 0-10 percent slope, with variable soil properties. A small portion of the site along Keawe Street is classified as ‘Ewa clay loam of moderately shallow depth with 0-2 percent slope. Areas with this designation include those filled with material dredged from the ocean or hauled from nearby areas, garbage, or general material from other sources.

Impacts and Mitigation Measures

In the short- and long- term, no significant impacts on soils are anticipated during the construction or operation of the proposed project. The project site is a previously developed site within the urban core of Honolulu. The project would involve some fine grading for new construction activities, as well as excavation for utility lines. The construction of the proposed project, however, will not involve any major land disturbing activities involving mass grading or significant revisions to site contours. Applicable best management practices and erosion control measures will be implemented, such as temporary sediment basins, temporary diversion berms and swales to intercept runoff, silt fences, dust fences, slope protection, stabilized construction vehicle entrance, grate inlet protection, truck wash down areas, and the use

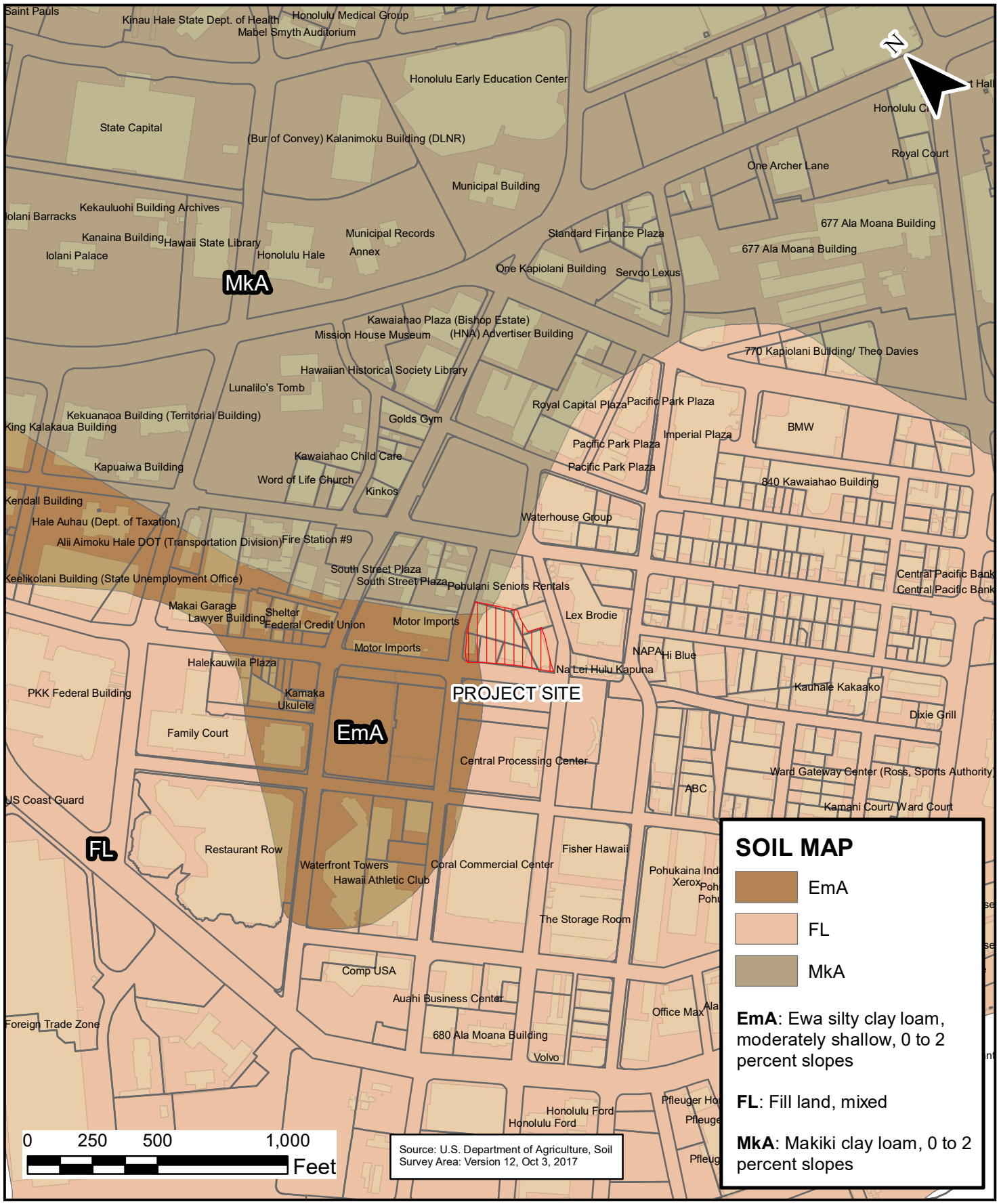

FIGURE 3-1
SOIL CLASSIFICATION MAP

WILSON OKAMOTO CORPORATION

of compost filter socks. Planting of landscaping also will be done as soon as possible on completed areas to help control erosion. Permanent sediment control measures will be used once construction is completed. Sequenced construction and minimized grading will limit the extent of surface area disturbance during each phase.

Coordination will be undertaken with the appropriate agencies during permitting and construction in order to ensure that the proposed project will not result in significant impacts with regard to soils and erosion. Any discharges related to project construction or operation activities will comply with applicable State Water Quality Standards as specified in Hawai‘i Administrative Rules, Chapter 11-54 and 11-55 Water Pollution Control, Department of Health. Excavation and grading activities will be regulated by applicable provisions of the City’s grading ordinance.

Masa Fujioka Associates, the project’s environmental consultant, did not identify any recognized environmental conditions (RECs), historical recognized environmental conditions (HRECs), or controlled recognized environmental conditions (CRECs) at the subject property, or contaminants which may have migrated to the subject property, having the potential to negatively affect its environmental integrity.

Geotechnical field exploration performed thus far suggest that the project site may be underlain by 4 to 6 feet of surface fill materials placed over 4 to 5 feet of loose to medium dense lagoonal deposits. Coralline detritus deposits interbedded with medium hard to hard sandstone/coral formation were then encountered and extended to the maximum depth explored of about 103.5 feet below the existing ground surface. Shallow groundwater levels were encountered at depths of about 4.3 and 4.8 feet below the existing ground surface in the two borings drilled to date.

Based on the anticipated subsurface conditions and relatively high structural column loads, a deep foundation system is recommended consisting of 18 and/or 24-inch diameter ACIP piles to support the proposed high-rise buildings. For preliminary planning and design purposes, ACIP piles with a diameter of 18 or 24 inches extending to depths of about 35 to 90 feet may be used to achieve an allowable compressive load capacity ranging from 400 to 1,200 kips per pile.

As part of the pre-construction activities, drilling about 10 to 20 ACIP indicator piles (at production pile locations) extending to depths of about 75 to 90 feet below the bottom of foundation cap elevations is recommended. In addition, conducting a static load test on a sacrificial 24-inch diameter ACIP pile extending to a depth of about 90 feet below the ground surface is recommended.

3.3 Hydrology

3.3.1 Surface Waters, Coastal Waters, and Sea Level Rise

Southern O‘ahu’s coastal plain, which includes the Kaka‘ako Peninsula, is underlain by sedimentary deposits that form caprock retarding seaward movement of fresh groundwater from the basal aquifer. The caprock extends along the coastline to about 800 to 900 feet below sea level.

The nearest surface stream in the vicinity of the project site is Nuʻuanu Stream, located about one mile north of the project site, where it discharges into Honolulu Harbor. Urbanization of the Kakaʻako area and upland areas has increased runoff to the nearshore coastal waters. Although drainage improvements in the Kakaʻako area have been implemented, much of the area is still subject to localized flooding because of its flat topography and remaining inadequate drainage facilities.

The nearest coastal water to the project site is about 0.35 mile to the south at Kewalo Basin, which opens onto Māmala Bay which forms Honolulu's coastline. Pursuant to Hawaiʻi Administrative Rules (HAR) Title 11, Chapter 54, Water Quality Standards, the coastal waters in the vicinity of the project site are classified as Class A marine waters. Class A marine waters are recognized as waters to be used for "recreational purposes and aesthetic enjoyment to be protected. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class."

Honolulu Harbor is located approximately a half mile to the east of the project site at Pier 2. These waters are also classified as Class A marine waters.

Among the impacts associated with climate change is the threat of rising sea levels. Recent projections of global sea level rise (SLR) estimate an increase of up to 9.5 inches by 2037. This is of particular concern to low-lying coastal communities and ecosystems that are exposed to a variety of coastal hazards, such as tsunamis and hurricanes. These hazards and the resulting risk to coastal areas can be exacerbated by SLR.

Impacts and Mitigation Measures

No short- or long-term significant impacts on surface and/or coastal waters in the project vicinity are anticipated during construction or operation of the proposed project. There are no streams or wetlands on or within close proximity to the project site.

In the short-term, construction activities will involve land-disturbing activities that may result in some soil erosion, however, mitigation measures will be incorporated into the project's construction plans to minimize soil disturbances and potential stormwater runoff. Applicable best management practices and erosion control measures may include temporary sediment basins, temporary diversion berms and swales to intercept runoff, silt fences, dust fences, slope protection, stabilized construction vehicle entrance, grate inlet protection, truck wash down areas, and use of compost filter socks. Planting of landscaping also will be done as soon as possible on completed areas to help control erosion. Permanent sediment control measures will be used once construction is completed. Phased construction will limit the extent of surface area disturbance during each phase. Coordination will be undertaken with the appropriate agencies during permitting and construction in order to ensure that the proposed project will not result in significant impacts with regard to soils and erosion. Any discharges related to project construction or operation activities will comply with applicable State Water Quality Standards as specified in Hawaiʻi Administrative Rules, Chapter 11-54 and 11-55 Water Pollution Control, Department of Health.

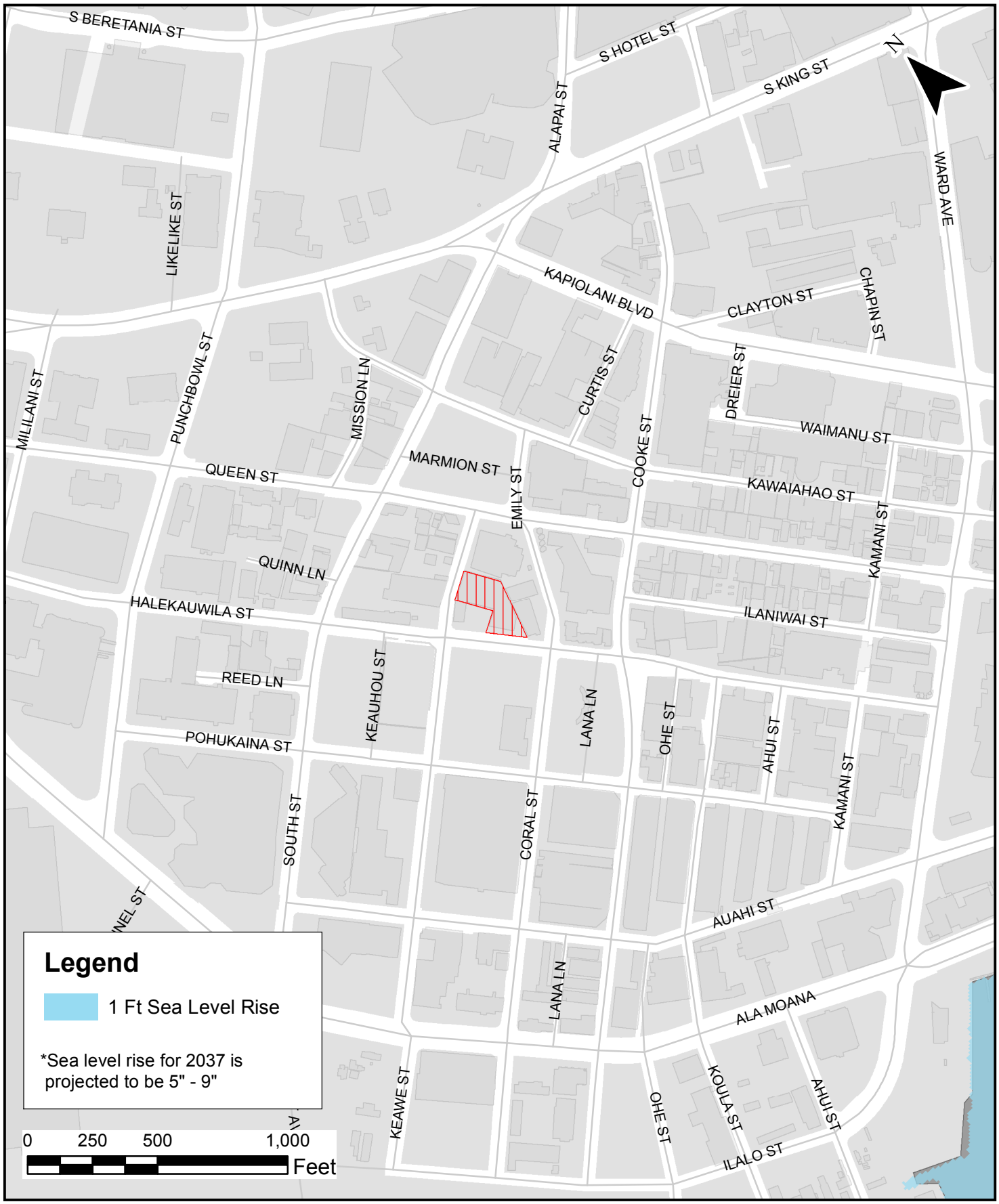

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FIGURE 3-1A
2037 PROJECTED SEA LEVEL RISE MAP

ILILANI ENVIRONMENTAL ASSESSMENT

Excavation and grading activities will be regulated by applicable provisions of the City's grading ordinance.

In planning for the impacts of climate change, the national standard for assessing the potential impacts of sea level rise on coastal projects has been developed by the United States Army Corps of Engineers (USACE). In December 2013, the USACE issued an Engineering Circular (EC 1165-2-212) which provides "guidance for incorporating the direct and indirect physical effects of projected future sea level change across the project life cycle in managing, planning, engineering, designing, constructing, operating, and maintaining USACE projects." The circular can be used as the basis for assessing the "potential relative sea level change" that might be experienced by projects in shoreline areas, and is required to be used for all USACE civil works. More recently, USACE has provided online tools which can be used to adapt the circular's guidance to reflect historic sea level rise conditions measured at the Honolulu National Oceanic and Atmospheric Administration (NOAA) tidal gauges. The online calculator utilizes two sets of historic data to estimate future scenarios: the USACE Scenarios (Low, Intermediate, and High), and the NOAA Scenarios (Low, Intermediate Low, Intermediate High, and High). This tool can be used to quickly and easily provide a range of scenarios of potential relative sea level change from the present to 2100.

The USACE/NOAA Low Scenario estimates a rise (relative to 2017 baseline levels) of just 0.03 feet (0.36 inches) by the year 2020, and 0.05 feet (0.6 inches) by 2025. Meanwhile, the USACE Intermediate/NOAA Intermediate Low Scenario estimates a rise of 0.17 feet (3.2 inches) by 2027, and 0.22 feet (5.6 inches) by 2037. The highest scenario, NOAA High, estimates a rise of .63 feet (7.6 inches) by 2027, and 0.79 feet (9.5 inches) by 2037. As the SLR is estimated to be anywhere between 5.6 inches and 9.5 inches by the year 2037, the potential impact of sea level rise on this Project site is thus predicted to be minimal (See Figure 3-1A)

Nonetheless, individual new projects cannot effectively mitigate sea level rise more than the 2037 SLR estimate, as entire districts and their roadways will be affected, isolating newer projects. Large scale sea walls or levies as found in cities like New Orleans or the Netherlands may be needed to mitigate SLR in excess of 2037 estimates.

3.3.2 Groundwater

The State Department of Land and Natural Resources (DLNR), Commission on Water Resource Management (CWRM) has established a groundwater hydrologic unit and coding system for groundwater resource management. The proposed project site is located within the Honolulu Sector Area which is comprised of six Aquifer System Areas identified as Waiʻalae – East, Waiʻalae – West, Pālolo, Nuʻuanu, Kalihi and Moanalua. The project site is located within the Nuʻuanu Aquifer System (30102) area which has an estimated yield of 14 million gallons per day (mgd).

<u>Impacts and Mitigation Measures</u>

No short- or long-term significant impacts on groundwater in the project vicinity are anticipated during construction or operation of the proposed project. The project site

is located makai of the Underground Injection Control Line and the Honolulu Board of Water Supply's No Pass Zone Line, both of which demarcate areas where wastewater disposal facilities would not affect potable water supplies (See Figure 3-3).

Infiltration of water at the project site would eventually reach seawater in the ground as opposed to the aquifers discussed above, which lie below the caprock. Construction activities are not likely to introduce to, nor release from the soils, any materials that could adversely affect the underlying groundwater. Construction material wastes will appropriately be disposed of to prevent any leachate from contaminating groundwater.

3.4 Natural Hazards

3.4.1 Flood and Tsunami Hazard

Honolulu is vulnerable to flooding from inland streams, hurricane and tropical storm surge, and seasonal high waves. Nu'uanu stream and Honolulu, in general, have historically experienced widespread flooding (Fletcher et al. 2002).

According to the Flood Insurance Rate Map (FIRM), (Community Panel Number 1500010115 C) prepared by the Federal Emergency Management Agency (FEMA), the project site is designated Zone X, an area determined to be outside of 500-year floodplain (See Figure 3-2). There are no base flood elevations or depths shown within this zone.

The Civil Defense Tsunami Inundation Maps Panel 19 indicates that the project site is not located in an area vulnerable to tsunami inundation.

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts on flood hazards in the project area are anticipated. The proposed improvements are unlikely to increase flood risks or cause any adverse flood-related impacts at the project site or lower elevation properties. For development done in the various phases, all drainage improvements, excavation and grading will be coordinated with the appropriate agencies during permitting and construction in order to ensure that the proposed project will not result in significant impacts regarding flood and tsunami hazards

3.4.2 Hurricane and Wind Hazard

The Hawaiian Islands are seasonally affected by Pacific hurricanes from the late summer to early winter months. The State has been affected twice since 1982 by significant hurricanes, 'Iwa in 1982 and 'Iniki in 1992. During hurricanes and storm conditions, high winds cause strong uplift forces on structures, particularly on roofs. Wind-driven materials and debris can attain high velocity and cause devastating property damage and harm to life and limb. It is difficult to predict these natural occurrences, but it is reasonable to assume that future events will occur. The project area is, however, no more or less vulnerable than the rest of the island to the destructive winds and torrential rains associated with hurricanes.

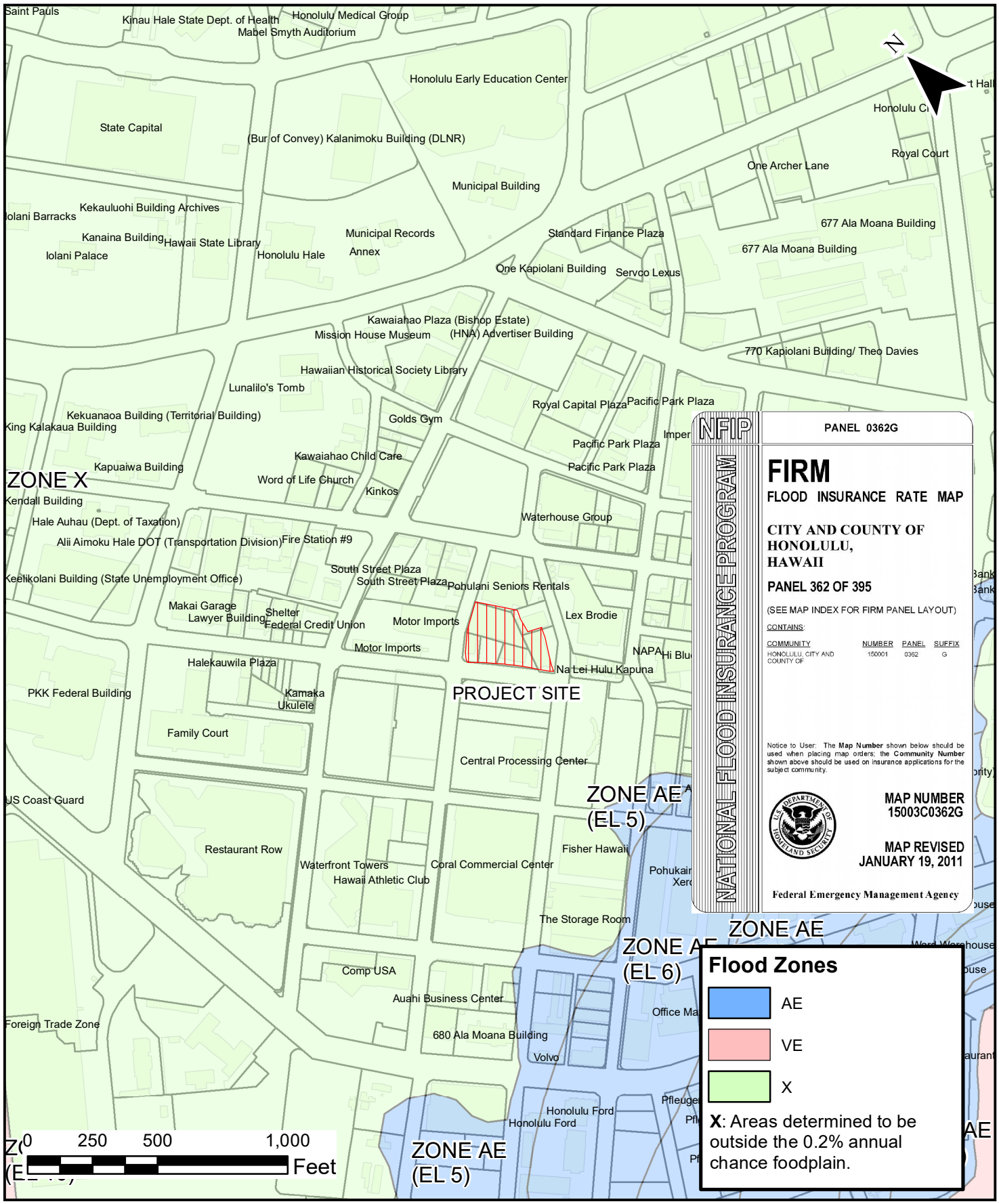

FIGURE 3-2
FIRM CLASSIFICATION MAP

Impacts and Mitigation Measures

The potential for hurricanes, while relatively rare, is present. To safeguard against hurricane damage, project improvements will be designed in compliance with American Society of Civil Engineers and International Building Code standards for wind exposure.

Wind speeds at all grade and above-grade level locations are predicted to pass the criterion used to assess pedestrian wind safety in both the existing and proposed test configurations.

In the existing condition, without the presence of Ililani Tower, appropriate wind speeds exist at most grade level areas of the site. Slightly uncomfortable conditions exist at the junction of Queen Street and Keawe Street.

With the addition of the proposed Ililani Tower, appropriate wind comfort conditions are expected at most grade level locations. Marginally uncomfortable wind speeds are predicted at along Keawe Street near the proposed development (similar to what is currently experienced at the junction of Queen Street and Keawe Street).

Wind conditions on the south areas of the podium are expected to be comfortable for standing throughout the year, which is considered appropriate. The wind speeds at the north areas of the podium are predicted to be higher, and are predicted to be comfortable for strolling and walking.

3.4.3 Seismic Hazard

O‘ahu’s southern shoreline is located within the Moloka‘i Seismic Zone. This region of O‘ahu is classified as 2A Seismic Zone under the Uniform Building Code (UBC). Zone 2A is characterized as having earthquakes that may cause minor damage to structures. The Honolulu coastline is assessed to have moderately high vulnerability to earthquakes (Fletcher et al. 2002).

Impacts and Mitigation Measures

O‘ahu has not experienced significant seismic events in the modern era. The proposed project improvements would meet prevailing building codes, which incorporate specifications to reduce vulnerability to earthquakes.

3.5 Natural Environment

3.5.1 Flora and Fauna

The project site is located in a highly altered urban environment. Consequently, no rare, threatened or endangered flora or fauna species have been observed at the project site. Species most commonly frequenting the site and vicinity are typical of urbanized areas and consist of common introduced flora and fauna.

The Wedge-tailed Shearwater (`Ua`u kani – *Puffinus pacificus*) is an indigenous seabird species that occasionally overflies the the Kaka‘ako Makai Area. Their breeding season

begins in February and by November both adults and fledglings have migrated to the ocean. During this migration, fledglings may become disoriented by artificial lighting and can crash or fall. If they are not killed as a result of the collision, the injured fledglings become easy targets for predatory animals such as cats, dogs, and mongoose. On some neighbor islands, such disorientation by artificial lighting is of particular concern when it involves endangered seabird species, specifically the Newell's Shearwater (`A`o - Puffinus auricularis newelii) and the Hawaiian Petrel (`Ua`u -Pterodroma sandwichensis). The Wedge-tailed Shearwater, however, is neither an endangered or threatened species, nor is it a rare species. Nevertheless, it is protected under Chapter 13, Section 124, HAR, which prohibits injuring or killing indigenous wildlife.

With the exception of the endangered Hawaiian Hoary bat (Lasiurus cinereus semotus), all terrestrial mammals currently found on the Island of O‘ahu are alien species, and most are ubiquitous.

Impacts and Mitigation Measures

Potential adverse impacts on flora and fauna are not anticipated. The project site is located within a highly altered urban environment. No listed or protected plant species are known from the project area. Rare, threatened, or endangered fauna are not known to utilize the site for either habitat or foraging purposes. 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.

No adverse impacts resulting from the project are anticipated. However, measures to prevent adverse effects to protected seabirds from night lighting will include the following:

- During construction activities, all nighttime lighting will be shielded and angled downward to reduce glare and disruption of bird flight.
- Following construction, permanent light sources will be shielded and angled downward to eliminate glare that could disturb or disorient birds in flight.

3.6 Historic and Archaeological Resources

As a private project requesting use of State funds on privately-owned land, the project's historic preservation review falls under Hawai'i Revised Statutes (HRS) §6E-42 and Hawai'i Administrative Rules (HAR) §13-284. To fulfill this review process, Cultural Surveys Hawai'i, Inc. (CSH) and the project proponents consulted with the Hawai'i State Historic Preservation Division (SHPD), the O'ahu Island Burial Council (OIBC), and a recognized Native Hawaiian cultural descendants from the Kaka'ako area (list of consulted parties included herein as part of Appendix B). Based on this consultation, it was agreed that the project did not need an archaeological inventory survey plan (AISP), but that an archaeological inventory survey (AIS) would be needed to fulfill the requirements of HAR §13-276 (which describes the AIS procedures to identify, document, make significance assessments, evaluate project effect, and develop mitigation measures for any archaeological historic properties, including burial sites, that could be affected by the project). This AIS investigation is currently underway by

CSH, working with Native Hawaiian cultural monitors from 'Oiwi Cultural Resources (OCR). The list below summarizes the ongoing consultation to support the project and its AIS effort.

1. Consultation meeting, including SHPD and OIBC members and previously recognized Native Hawaiian cultural descendants from the Kaka'ako vicinity: February 13, 2017
2. Meeting with SHPD: March 2, 2017
3. First update to OIBC: March 8, 2017
4. Confirmation with SHPD that AISP not needed and confirmation with SHPD of the general testing strategy for AIS: Email CSH to SHPD March 14, 2017
5. OIBC update: April 12, 2017
6. OIBC update: May 10, 2017
7. SHPD update: June 22, 2017
8. OIBC update: June 28, 2017
9. SHPD update: November 22, 2017
10. Draft AIS: Submitted to SHPD on April 27, 2018 with HHFDC Cover Letter dated April 4, 2018
11. OIBC update: September 12, 2018
12. Draft AIS : Resubmitted to SHPD on September 14, 2018

Impacts and Mitigation Measures

Current AIS investigation efforts for the subject project are ongoing. The Draft AIS was submitted to SHPD on April 27, 2018, and resubmitted September 14, 2018, in response to SHPD comments. At this time, the Draft AIS is still being reviewed and has not been accepted by SHPD. To fulfill the requirements set forth by HAR §13-276, the proposed project will comply with all recommendations made under the AIS and SHPD's approval of that document and process. Consequently, the proposed project will avoid significant impacts on historic and archaeological resources.

As a result of consultation with the SHPD's Architecture Branch regarding potential impacts to standing architecture that is older than 50 years and that could be significant architectural historic properties, in February 2017, Mason Architects prepared an architectural reconnaissance level survey (RLS) for the project area's standing architecture. The RLS concluded that the project area's standing architecture did not constitute significant architectural historic properties.

SHPD has issued a letter stating that "SHPD has reviewed the proposed project, pursuant to HRS Chapter 6E-42 and SHPD has determined no historic properties affected. SHPD's review for the above cited project is now complete. No further consultation or review is required at this time."

3.7 Cultural Resources and Practices

A Cultural Impact Assessment for the Kakaʻako Community Development District Mauka Area Plan, Waikīkī Ahupuaʻa, Honolulu (Kona) District, Oʻahu Island dated December 2008 was prepared as part of the Environmental Impact Statement for the Hawaiʻi Community Development Authority's Kakaʻako Community District Mauka Area Plan. An additional, supplemental CIA was also prepared in January 2014 for the Kakaako TOD EIS. The proposed Ililani project site falls within the Area of Potential Effect (APE) of these studies.

Previous CIA documentation found that the general area of Kakaʻako Makai was characterized by fishponds, salt ponds, occasional taro loi, and trails connecting Honolulu and Waikīkī and also noted that the Kewalo, Kaakaukui, and Kukuluaeo districts were traditionally noted for fishponds, salt pans, and marshlands

Impacts and Mitigation Measures

None of the cultural resources, practices or accesses identified in the Cultural Impact Assessment are currently associated with or evident in the project vicinity, which has been completely urbanized.

Based on the above, the potential for adverse effects on traditional and cultural practices is not anticipated. Construction of the proposed project improvements will not disturb traditional sacred sites or traditional cultural objects; will not result in the degradation of resources used by Native Hawaiians for subsistence or traditional cultural practices; will not obstruct culturally significant landforms or way-finding features; and, will not result in loss of access to the shoreline or other areas customarily used by Native Hawaiians or others for resource gathering or traditional cultural practices. No mitigation measures are proposed.

3.8 Air Quality

The State of Hawaiʻi Department of Health (DOH), Clean Air Branch, monitors the ambient air quality in the State for various gaseous and particulate air pollutants. The U.S. Environmental Protection Agency (EPA) has set national ambient air quality standards (NAAQS) for six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), ozone (O_3), and particulate matter (PM_{10} and PM_2). Hawaiʻi has also established a state ambient air standard for hydrogen sulfide (H_2S) related to volcanic activity on Hawaiʻi Island. The primary purpose of the statewide monitoring network is to measure ambient air concentrations of these pollutants and ensure that these air quality standards are met.

Air pollution in Hawaiʻi is caused by many different man-made and natural sources. There are industrial sources of pollution, such as power plants and petroleum refineries; mobile sources, such as cars, trucks and buses; agricultural sources, such as dust from fields, and natural sources, such as windblown particulates and volcanic activity. The DOH Clean Air Branch is responsible for regulating and monitoring pollution sources to ensure that the levels of criteria pollutants remain well below the State and federal ambient air quality standards.

The State maintains six air monitoring stations on the island of Oʻahu, where most commercial, industrial and transportation activities and their associated air quality effects occur. Hawaiian Electric Company's downtown power plant is the primary stationary source, while vehicular traffic represents the principal mobile contributor. Emissions from the power plant are in compliance with State and Federal air pollution control regulations.

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts on air quality are anticipated as a result of the construction and operation of the proposed project. A portion of the construction for the proposed project will involve fine grading as well as limited

excavation for utility lines. Fugitive dust will be controlled, as required, by methods such as dust fences, water spraying and sprinkling of loose or exposed soil or ground surface areas. As deemed appropriate, planting of landscaping will be done as soon as possible on completed areas to also help control dust. Respective contractors will be responsible for minimizing air quality impacts during the various phases of construction.

Exhaust emissions from construction vehicles are anticipated to have negligible impact on air quality in the project vicinity as the emissions would be relatively small and readily dissipated. In the long-term, some vehicular emissions related to operations at the project site are expected, however, due to the generally prevailing trade winds, the emissions would be readily dissipated.

3.9 Noise

The existing noise environment at the project site is characteristic of an urban setting. Ambient noise in the project area is predominantly attributed to vehicular traffic traveling along Ala Moana Boulevard and adjacent roadways and aircraft overflights.

Impacts and Mitigation Measures

In the short-term, noise from construction activities such as excavation, grading, cutting, and paving will be unavoidable. The increase in noise level will vary according to the particular phase of construction. Noise may also increase as a result of operation of heavy vehicles and other power equipment during the construction period. Construction activities will not involve pile-driving, as design schemes call for drilled piers, which are much less noisy.

An acoustic study prepared for Ililani is on file with HHFDC, the study focuses on construction detailing of the Ililani project to manage internal and external noise affecting the end state project in accordance with State of Hawaii regulations. Any HART noise impacting Ililani occupants will be mitigated by facade detailing.

Construction noise impacts will be mitigated by compliance with provisions of the State DOH Administrative Rules, Title 11, Chapter 46, “Community Noise Control” regulations. These rules require a noise permit if the noise levels from construction activities are expected to exceed the allowable levels stated in the DOH Administrative Rules. It shall be the contractor’s responsibility to minimize noise by properly maintaining noise mufflers and other noise-attenuating equipment, and to maintain noise levels within regulatory limits. Also, the guidelines for heavy equipment operation and noise curfew times, as set forth by the DOH noise control rules, will be adhered to; or, if necessary, a noise permit shall be obtained.

In the long-term, no significant noise impacts are anticipated once the construction of the proposed project has been completed. Ambient noise levels in the vicinity will increase slightly as a result of the associated increase in vehicular traffic generated by the proposed project.

3.10 Hazardous Material

Masa Fujioka & Associates prepared an Environmental Hazard Evaluation and Environmental Hazard Management Plan (EHE/EHMP) in July of 2018 for the subject project. This effort was prompted by the discovery of potential lead contamination during the removal of an underground 550-gallon gasoline storage tank in December 2017, and is included herein as Appendix D. Upon the identification of lead in on-site soils, a release was reported to the Hawaiʻi Department of Health (HDOH) Soil and Hazardous Waste Branch (SHWB) and assigned the Facility ID 9-103972 and Release ID 180013. Based on the results of the soil sampling, SHWB requested that groundwater sampling and analysis occur in compliance with HAR Title 11, Chapter-281, Subchapter 7 (Release Response Action).

Impacts and Mitigation Measures

An EHE/EHMP was submitted to and approved by the HDOH SHWB for the proposed project. The EHMP is site-specific and addresses the lead contamination hazard during future demolition and construction activities. The EHE addresses health impacts to humans and the hazards to the environments. The EHE/EHMP was prepared prior to the completion of the site investigation and was based on the assumption that the source of the lead contamination was the underground gasoline storage tank, and therefore; the lead contamination likely limited to the vicinity of that underground storage tank. The EHE/EHMP specifically addresses potential lead contamination, along with hazards and precautions across the subject site and adjacent properties associated with the development of the proposed project.

EHE/EHMP documentation concludes that after further analysis, lead contamination did not result from a release of gasoline from the underground storage tank, and was likely brought in with fill material placed at the site prior to its original development. However, further characterization across the entire subject site and adjacent properties is not practical due to the constriction of the buildings.

Based on sampling and laboratory analyses of soil and groundwater, environmental concerns at the site are limited to the presence of lead in the soil. No petroleum constituents were detected in the soil or groundwater. No lead was detected in the groundwater. Lead is not highly mobile and therefore, leaching is not a concern.

Lead present on site does not constitute a tangible/terrestrial hazard as the site is completely paved and no threatened or endangered species habitats exist in the area, which is an urban, commercial environment.

In a letter dated August 31, 2018 the State of Hawaiʻi Department of Health (See Appendix E) concurred with the findings of the subject EHE/EHMP that leaching, direct exposure, and sub-slab soil vapor are not potential hazards at the project site due to the lack of petroleum hydrocarbons in soil and groundwater and the absence of dissolved lead in groundwater samples from nearby monitoring wells.

3.11 Traffic

A Traffic Impact Report (TIR) was prepared by Wilson Okamoto Corporation in December of 2017 to identify and assess the potential traffic impacts that could result from the development of the proposed Ililani project. The findings of this report are summarized below, and included herein as Appendix A.

Area Roadway System

Halekauwila Street is a predominantly two lane, two-way roadway generally oriented in the east-west direction. Southwest of the project site, Halekauwila Street intersects Keawe Street. At this unsignalized intersection, both approaches of Halekauwila Street have one stop-controlled lane that serves all traffic movements. Keawe Street is a predominantly two-lane, two-way roadway oriented generally in the north-south direction between Queen Street and Ilalo Street. At the intersection with Halekauwila Street, both approaches of Keawe Street also have a stop-controlled lane that serves all traffic movements.

North of the intersection with Halekauwila Street, Keawe Street intersects Queen Street. At this unsignalized intersection, both approaches of Queen Street have a shared left-turn and through lane with a shared right-turn and through lane. Queen Street is a predominantly four-lane, two-way roadway which transitions to a two-lane, two-way roadway east of the intersection with Cooke Street. At the intersection with Queen Street, the northbound approach of Keawe Street has one stop-controlled lane that serves all traffic movements. The southbound approach of this intersection is comprised of a driveway for the adjacent Keola Lai development which has one lane that also serves all traffic movements.

East of the intersection with Keawe Street, Queen Street intersects Cooke Street. At this signalized intersection, both approaches of Queen Street have one lane that serves the left-turn and through movements and one lane that serves right-turn and through movements. Cooke Street originates at Ilalo Street as a two-lane, two-way roadway, transitions to a four-lane roadway between Ala Moana Boulevard and Kapiolani Boulevard, then returns to a two-lane roadway until its terminus on South King Street. At the intersection with Queen Street, both approaches of Cooke Street have a shared left-turn and through lane and a shared right-turn and through lane. It should be noted that there are posted signs prohibiting right-turn movements on red at all approaches of this intersection.

South of the intersection with Queen Street, Cooke Street intersects Halekauwila Street. At this all-way stop intersection, both approaches of Cooke Street have a shared left-turn and through lane and a shared right-turn and through lane, while both approaches of Halekauwila Street have one stop-controlled lane that serves all traffic movements.

West of the intersection with Cooke Street, Halekauwila intersects Coral Street. At this unsignalized T-intersection, the westbound approach of Halekauwila Street has one lane that serves right-turn and through movements, while the eastbound approach has one lane that serves left-turn and through movements. Coral Street is a predominantly two-lane, two-way roadway generally oriented in the north-south direction. The northern segment of Coral Street extends between Queen Street and Halekauwila Street while the southern segment extends between Pohukaina Street and Ala Moana Boulevard. At the intersection with Halekauwila Street, the southbound approach of Coral Street has a stop-controlled lane that

serves right-turn and left-turn movements. The area roadway network is shown in Figure 1 of the appended TIR (Appendix A).

Existing Traffic Conditions

The subject TIR is based on the concept of Level of Service (LOS) to identify the traffic impacts associated with traffic demands during the peak periods of traffic. LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F"; LOS "A" representing ideal or free-flow traffic operating conditions and LOS "F" unacceptable or potentially congested traffic operating conditions.

A field investigation was conducted in February 2017 and consisted of manual turning movement count surveys during the morning peak hours between 6:00 AM and 9:00 AM, and the afternoon peak hours between 3:00 PM and 6:00 PM at the following intersections:

- Halekauwila Street and Keawe Street:
  At the intersection with Keawe Street, Halekauwila Street carries 153 vehicles westbound and 122 vehicles eastbound during the AM peak period. During the PM peak period, the traffic volumes are higher with 178 vehicles and 435 vehicles traveling westbound and eastbound, respectively. Both approaches of Halekauwila Street operate at LOS "A" during the AM peak period. During the PM peak period, the westbound approach operates at LOS "B" while the eastbound approach operates at LOS "C" during the same peak period.

  Along Keawe Street, the northbound approach of the intersection carries 67 vehicles, while the southbound approach carries 108 vehicles during the AM peak period. During the PM peak period, traffic volumes are higher with 82 vehicles traveling northbound and 184 vehicles traveling southbound. The northbound approach of Keawe Street operates at LOS "A" during both peak periods, while the southbound approach operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively.

- Queen Street and Keawe Street:
  At the intersection with Keawe Street, Queen Street carries 672 vehicles westbound and 302 vehicles eastbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 524 vehicles traveling westbound and 685 vehicles traveling eastbound. Both approaches of Queen Street operate at LOS "A" during both peak periods.

  The northbound approach of Keawe Street carries 44 vehicles during the AM peak period and 75 vehicles during the PM peak period. This approach operates at LOS "B" during the AM peak period and LOS "C" during the PM peak period. The southbound approach carries 69 vehicles during the AM peak period and 22 vehicles during the PM peak period. This approach operates at LOS "B" during both peak periods.

- Queen Street and Cooke Street:
  At the intersection with Cooke Street, Queen Street carries 463 vehicles westbound and 216 vehicles eastbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 456 vehicles traveling westbound and 617

vehicles traveling eastbound. Both approaches of Queen Street operate at LOS "A" during the AM peak period, while the westbound and eastbound approaches operate at LOS "A" and LOS "B" during the PM peak period, respectively.

The northbound approach of Cooke Street carries 239 vehicles during the AM peak period and 496 vehicles during the PM peak period, while the southbound approach carries 319 vehicles during the AM peak period and 356 vehicles during the PM peak period. Both approaches operate at LOS "A" and LOS "B" during the AM and PM peak periods, respectively.

- Halekauwila Street and Cooke Street:
  At the intersection with Cooke Street, Halekauwila Street carries 105 vehicles and 208 vehicles westbound during the AM and PM peak periods, respectively, while the eastbound approach carries 137 vehicles and 407 vehicles during the AM and PM peak periods, respectively. Both approaches operate at LOS "A" during the AM peak period, while the westbound and eastbound approaches operates at LOS "C" and LOS "D" during the PM peak period, respectively.

  Along Cooke Street, the northbound approach of the intersection carries 201 vehicles, while the southbound approach carries 271 vehicles during the AM peak period. During the PM peak period, the traffic volumes are higher with 347 vehicles traveling northbound and 344 vehicles traveling southbound. Both approaches operate at LOS "A" and LOS "B" during the AM and PM peak periods, respectively.

- Halekauwila Street and Coral Street:
  At the intersection with Coral Street, Halekauwila Street carries 127 vehicles westbound and 131 vehicles eastbound during the AM peak period. During the PM peak period, the traffic volumes are higher with 147 vehicles traveling westbound and 417 vehicles traveling eastbound. Both approaches of Halekauwila Street operate at LOS "A" during both peak periods.

  The southbound approach of Coral Street carries 31 vehicles during the AM peak period and 63 vehicles during the PM peak period. This approach operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively.

Transit Oriented Development

The proposed Ililani and the Honolulu High-Capacity Transit Corridor Project are mutually beneficial. A reliable high capacity transit system along with a range of housing choices will encourage residents to reduce their dependence on individual automobiles. The Ililani project also supports Transit Oriented Development (TOD) by providing relatively high-density housing in a convenient location near proposed transit stations. TOD is designed to maximize access to public transportation and often incorporates features to encourage transit ridership. A TOD neighborhood will typically have a transit station surrounded by relatively high-density development within a 10-minute walk surrounding the station. Features of TOD include mixed-use development that will use transit at all times of the day, excellent pedestrian facilities, collector support from other modes of transportation (buses and shuttles) and reduced amount of parking for personal vehicles.

Impacts and Mitigation Measures

The proposed development is expected to be completed and occupied by the Year 2020 with primary access provided via two driveways off Halekauwila Street, one entering and one exiting. The City and County is currently developing a fixed guideway transit system that is planned to run along Halekauwila Street (within 130 yards of the project site) and therefore, the entering project driveways is expected to be restricted to right-turn-in movements only while the exiting driveway is expected to be restricted to right-turn-out movements only.

Total Traffic Volumes Without Project

Under Year 2020 without project conditions, traffic operations at the intersection of Halekauwila Street and Cooke Street are expected to decline slightly due to the anticipated growth in ambient traffic along these roadways. The northbound and southbound approaches of the Halekauwila Street and Cooke Street intersection are expected to operate at a slightly lower, but acceptable, LOS "C" during the PM peak period, while traffic operations are anticipated to deteriorate from an LOS "D" to an LOS "E" along the eastbound approach during the same peak period. The remaining study intersections along Halekauwila Street and Queen Street are anticipated to remain at levels of service similar to existing conditions.

Total Traffic Volumes With Project

The Year 2020 cumulative AM and PM peak hour traffic conditions with the Ililani development are summarized in Table 3-1. The existing and projected Year 2020 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in the full TIR.

Under Year 2020 with project conditions, traffic operations in the vicinity are generally expected to remain similar to without project conditions despite the anticipated increases in traffic along the surrounding roadways. Along Queen Street, traffic operations at the intersection with Cooke Street are expected to remain at LOS "B" or better during both peak periods while those at the intersection with Keawe Street are expected to continue operating at LOS "C" or better during both peak periods. Similarly, the approaches of the study intersections along Halekauwila Street are also generally anticipated to operate at levels of service similar to without project conditions.

Recommendations & Conclusion

Based on the analysis of the traffic data, the following are the recommendations of this study to be incorporated in the project design.

1. Maintain sufficient sight distance for motorists to safely enter and exit the project driveway. In particular, ensure that the proposed speed ramp on the east edge of the project site has sufficient sight distance to vehicles traveling along the adjacent road way and vehicles accessing the parking area for the adjacent property

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

Table 3-1: Existing and Projected Year 2020 (Without and With Project) LOS Traffic Operating Conditions

Intersection	Approach/ Critical Movement	AM			PM		
		Exist	Year 2020		Exist	Year 2020	
			w/out Proj	w/ Proj		w/out Proj	w/ Proj
Halekauwila St/ Keawe St	Eastbound	A	A	A	C	C	C
	Westbound	A	A	B	B	B	B
	Northbound	A	A	A	A	A	B
	Southbound	A	A	A	B	B	B
Queen St/ Keawe St	Eastbound	A	A	A	A	A	A
	Westbound	A	A	A	A	A	A
	Northbound	B	B	B	C	C	C
	Southbound	B	B	B	B	B	B
Queen St/ Cooke St	Eastbound	A	A	A	B	B	B
	Westbound	A	A	A	A	A	A
	Northbound	A	A	A	B	B	B
	Southbound	A	A	A	B	B	B
Halekauwila St/ Cooke St	Eastbound	A	B	B	D	E	E
	Westbound	A	A	A	C	C	C
	Northbound	A	A	A	B	C	C
	Southbound	A	A	A	B	C	C
Halekauwila St/ Coral St	Eastbound	A	A	A	A	A	A
	Southbound	A	A	A	B	B	B

*Westbound and Northbound traffic for Halekauwila St/Coral St are free flowing, consequently, LOS does not apply.

3. Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto public roadways.

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

5. If access to the entrance of the parking garage is controlled, provide sufficient storage for entering vehicles at the parking garage access control (i.e. automatic gate, etc.) to ensure that queues do not extend on the adjacent public roadway.

6. Restrict turning movements at the project driveway off Halekauwila Street to right-turn-in and right-turn-out movements only. Provide adequate channelization to direct vehicular movements exiting the driveway. The specific configuration shall be determined during the design phase.

7. Provide adequate on-site facilities to accommodate alternate modes of transportation including improved pedestrian facilities and secured bicycle racks/storage.

The project site for the proposed Ililani project entails the replacement of existing commercial uses with a new tower that will include multi-family residential units, retail space, and recreational amenities. Although all site-generated trips were conservatively assumed to be new trips in the project vicinity, traffic operations are generally expected to remain similar to without project conditions upon the projected completion of the Ililani project. As such, with the implementation of the aforementioned recommendations, the proposed Ililani project is not expected to have a significant impact on traffic operations in the project vicinity.

3.12 Visual Resources

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

The *Coastal View Study* prepared by the City and County of Honolulu identifies significant views within the SMA of O‘ahu. Significant views identified in the Downtown and Ala Moana study areas include:

- Continuous and intermittent views of Honolulu Harbor from Nimitz Highway
- Stationary views from Sand Island Park looking East, West and towards the mountain.
- Continuous makai views across Kewalo Basin and Ala Moana Park

Impacts and Mitigation Measures

Set among the residential towers of the Kakaako–Pauahi and Civic Center districts, the 42-story Ililani will be at an intermediate height of 367 feet. The immediately adjacent buildings within a half block are Keauhou Place and Keola Lai at height of 400 feet, and the neighboring Halekauwila Place and Pohulani at 193 feet and 265 feet, respectively.

From an architectural design standpoint, the proposed Ililani development will alternate full height glass and balcony vertical bands with semi-opaque ribbon window vertical bands to form a visual aesthetic that blends with the surrounding environment. It is anticipated that glass glazing will comply with all HCDA requirements. The low profile and footprint of the proposed tower, in contrast to the surrounding neighborhood will ensure that its final constructed form will not impact existing mauka-makai sightlines. Conceptual renderings of the project, as envisioned,

are offered herein as Figures 3-3, and 3-4. Consequently, no significant short- and long-term impacts are anticipated on visual resources.

3.13 Socio-Economic Characteristics

The project site is located within the Urban Honolulu Census Designated Place. Demographic and other information was reviewed from the U.S. Census 2010 for the Urban Honolulu CDP and the City and County of Honolulu and is shown on Table 3-2.

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

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

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

Impacts and Mitigation Measures

In the short- term, construction expenditures related to the project will provide positive benefits to the local economy. This would include creation of construction and construction support jobs, and the purchase of materials from local suppliers, as well as indirect benefits to local retail businesses resulting from construction activities. Notably, the proposed project improvements are geared towards the promotion of the economic stimulus in Honolulu's Urban Core. As result, even more jobs in this region could be created on the site and in the State as a whole. Tax revenues derived from the proposed action would further serve to stimulate regional, and statewide economic activity as well.

FIGURE 3-3
LATERAL VIEWPLANES

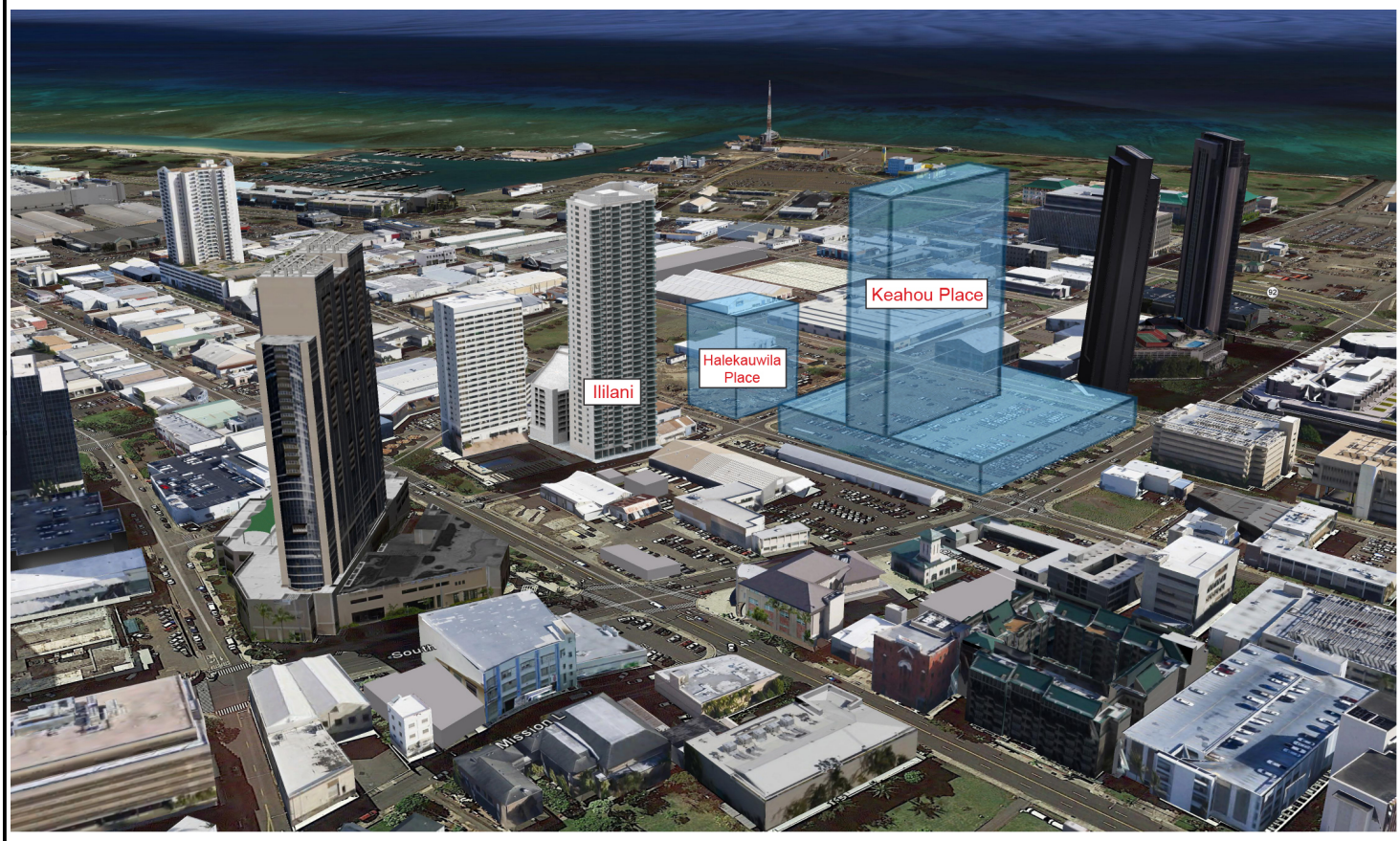

FIGURE 3-4
MAUKA-MAKAI VIEWPLNES

Table 3-2
Demographic Characteristics

Subject	Urban Honolulu CDP		City and County of Honolulu	
	Number	Percent	Number	Percent
Total Population	**337,256**	**100**	**953,207**	**100**
AGE				
Under 5 years	16,677	4.9	61,261	6.4
5-19 years	50,395	15	174,309	18.3
20-64 years	210,022	62.3	579,147	60.8
65 years and over	60,162	17.8	138,490	14.5
Median age (years)	41.3	--	37.8	--
RACE				
White	60,409	17.9	198,732	20.8
Black or African American	4,974	1.5	19,256	2.0
American Indian and Alaskan Native	743	0.2	2,438	0.3
Asian	184,950	54.8	418,410	43.9
Native Hawaiian and other Pacific Islander	28,260	8.4	90,878	9.5
Two or more races	55,080	16.3	213,036	22.3
Other	2,840	0.8	10,457	1.1
HOUSEHOLD (BY TYPE)				
Total households	**129,408**	**100**	**311,047**	**100**
Family households (families)	74,688	57.7	328,953	70.0
Married-couple family	52,431	40.5	161,172	51.8
With own children under 18 years	2,062	1.6	65,995	21.2
Female householder, no husband present	15,689	12.1	39,435	12.7
With own children under 18 years	5,321	4.1	15,027	4.8
Nonfamily household	54,720	42.3	93,205	30.0
Average household size	2.51	--	2.95	--
HOUSING OCCUPANCY AND TENURE				
Total housing Units	**143,173**	**100**	**336,889**	**100**
Occupied Units	129,408	90.4	311,047	92.3
By owner	56,742	43.8	174,387	56.1
By renter	72,666	56.2	136,660	43.9
Vacant Units	13,765	9.6	25,852	7.7

3.14 Public Services and Facilities

3.14.1 Police, Fire, and Medical Services

Police protection is provided by the City's Honolulu Police Department. The project area is a part of District 1 – Central Honolulu, Sector 3, which covers the downtown Honolulu area from the State Capitol area to Ala Moana Beach Park and is served by the Downtown Substation located at 79 North Hotel Street. Response time is less than 5 minutes.

Fire protection is provided by the City's Honolulu Fire Department. The project area is served by the Kaka'ako Fire Station located at 555 Queen Street, approximately two blocks from the project site.

The closest hospital to the project site is The Queen's Medical Center located approximately 1 mile northeast of the project site. The Queen's Medical Center is the largest private hospital in Hawai'i, with more than 3,000 employees and over 1,200 physicians on staff. Queen's offers a comprehensive range of primary and specialized care services.

Emergency medical service is provided by the City's Emergency Services Department, Emergency Medical Services (EMS) Division. The Department has 22 ambulance units under two districts. All ambulance units are designated as advanced life support units, meaning they are staffed by at least two people. The project area is served by District 2, which includes the southeast region of O'ahu. The Honolulu Fire Department also co-responds to medical emergencies, providing first aid in coordination with EMS.

Impacts and Mitigation Measures

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

In the long-term, the proposed project may require occasional police and fire protection, as well as medical services, however it would likely not represent a significant amount relative to the overall regional demand.

The proposed project will be designed and built in compliance with the applicable County fire code requirements.

3.14.2 Education

The project site is located within the State Department of Education's (DOE) Kaimuki-McKinley-Roosevelt Complex Area. The proposed Project is currently served by the DOE's Ka'ahumanu Elementary School, Washington Middle School, and McKinley High School.
The native Hawaiian emersion school 'Ānuenue, the Education Laboratory Public Charter School, and Halau Ku Mana Public Charter School are also located within the vicinity of the site. DOE records indicate that the complex has served approximately 14,500 students on an annual basis for the past several years. Generally speaking, statewide total enrollment numbers in DOE schools have remained virtually flat over the course of the past decade, fluctuating less than 2% in growth/decline on an annual basis.

When the project is fully mature and stabilized, roughly an estimated 40 DOE students (K-12) will reside here. The DOE High School which would serve the site, McKinley High School, is located approximately a mile away from the project site, currently has the capacity for roughly 115 additional students and its excess capacity is expected to decline in the next five years. Both Ka‘ahumanu Elementary School (located just over a mile away) and Washington Middle School (located nearly two miles away) have capacity for an additional 200 students, and that excess capacity is expected to remain for the next five years. It is expected that this excess capacity will change as other residential projects, also serviced by these schools, are completed.

The project is also located near a possible future elementary school site (adjacent to Halekauwila Place). The school was included in a conceptual planning process in 1998 but no commitments to the development of the school have been made.

Impacts and Mitigation Measures

As the proposed project will effectively increase the region’s housing inventory, it will result in an increase in demand for school facilities. In 2007, the Hawai‘i State Legislature enacted the school impact fee program allowing for the collection of impact fees from residential projects within the School Impact Fee Districts. School Impact Fee districts, designated by the Board of Education (BOE), are designated for areas of high growth that need the expansion of existing schools or the development of new schools to accommodate increased school enrollment from new residential developments. The proposed Project is within the Kalihi to Ala Moana (KAM) School Impact Fee District approved by theBOE. On February 15, 2018, BOE approved new Urban Area Guidelines for new school campus sizes and enrollment in the KAM School Impact Fee District. The KAM School Impact District fees will be imposed on projects for which a building permit is applied on or after Octrover 1, 2018. Ililani LLC applied for a building permit before October 1, 2018.

3.14.3 Recreational Facilities

The primary recreational resource in the vicinity of the project site is Ala Moana Park, located to the south and provides opportunities for surfing, bodyboarding, fishing, walking, bicycling, sightseeing, and picnicking. Amenities provided at the park include comfort stations, picnic areas, an amphitheater, and observation areas. Also nearby is the six-acre Kaka‘ako Makai Gateway Park which provides a large landscaped lawn for recreation and social activities. The Gateway Park is divided into two sections; a two-acre passive park and a four-acre playing field with a comfort station. In addition, the Children’s Discovery Center is located southeast from the project site and offers interactive educational exhibits for children and their families. Mother Waldron Park is also located within proximity to the site.

The Mauka Area Plan for Kaka‘ako also proposes to improve four “green” streets to enhance their existing links to adjoining parks and open space outside of the Mauka Area. Street Conditions, as well as landscaping on these streets will be improved with the ultimate goal of promoting walking and bicycling not just as environmentally friendly and cost effective modes of travel, but also as a form of outdoor recreation and exercise that promotes a healthy lifestyle. One of the “green” streets proposed is Cooke Street, which is one block away from the project site.

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts to recreational facilities are anticipated as a result of the construction and operation of the proposed project. However, the proposed project will contribute to the region's housing inventory and future residents will likely contribute to an increase in demand for regional recreational opportunities. Ililani provides approximately 12,000 s.f. of recreation deck that includes AOAO garden boxes that apartment owners can bid for to grow food plants, and 2,800 s.f. of internal recreational rooms. Ground Floor commercial space could also potentially provide recreational opportunities for project and area residents.

3.14.4 Solid Waste Collection and Disposal

Solid waste collection and disposal service is provided by the City and County of Honolulu's Department of Environmental Services (ENV) and numerous private companies. Solid waste collected in the Honolulu area is hauled to the Campbell Industrial Park H-POWER Plant for incineration that generates electricity, followed by disposal of ash and non-combustibles at the Waimanalo Gulch Sanitary Landfill. Construction and demolition material is disposed of at the privately-owned PVT landfill in Waiʻanae.

Impacts and Mitigation Measures

No short- or long-term significant impacts to municipal solid waste collection and disposal facilities are anticipated as a result of the construction and operation of the proposed project.

3.15 Infrastructure and Utilities

3.15.1 Water System

The project site is bordered on its south-eastern face by an 8-inch waterline along Halekauwila Street that connects to a 6-inch line running along Keawe Street and a 20-inch line running along Cooke Street. The nearest Board of Water Supply potable water source in the vicinity of the project site is the Beretania Station. The water system serving the project area is shown in Figure 3-5.

Impacts and Mitigation Measures

No short- or long-term significant impacts are anticipated to result from the development and operation of the proposed project improvements.

Water service will be provided from the 8-inch waterline. The applicant will be required to obtain a water supply allocation from the State Department of Land and Natural Resources and to pay the Board of Water Supply's Water System Facilities charges.

3.15.2 Wastewater System

An 8-inch municipal sewer line lies beneath Halekauwila Street fronting the project site (See Figure 3-6). That line discharges into a 10-inch line near the intersection of Cooke Street and Queen Street. The 10-inch line carries the combined flows to the City & County of Honolulu's Ala Moana (wastewater) Pump Station.

Impacts and Mitigation Measures

Wastewater service will be provided by the City and County of Honolulu's Department of Environmental Services (ENV). Wastewater from the proposed project will be conveyed to the existing 9-inch sewer line along Cooke Street. All wastewater flows generated at the project site will continue to be conveyed to the Ala Moana Pump Station.

No significant impacts are anticipated on the existing wastewater system as a result of the construction and operation of the proposed improvements as the collection, treatment and disposal system is adequate to serve the proposed development.

3.15.3 Drainage System

Stormwater runoff at the project is conveyed to a system of catch basins located on the southern side of project site. Those catch basins empty into a series of reinforced concrete pipes that run along Halekauwila Street (See Figure 3-7).

Impacts and Mitigation Measures

No short- or long-term significant impacts on the quantity or quality of drainage in the project vicinity are anticipated during construction or operation of the proposed project. There are no streams or wetlands on or within close proximity to the project site. Construction of the proposed project will not involve major land disturbing activities. Applicable erosion control measures and best management practices will be implemented in order to mitigate any possible adverse effects relating to runoff. As applicable for each phase, these may include but are not be limited to: temporary sediment basins, temporary diversion berms and swales to intercept runoff, silt fences, dust fences, slope protection, stabilized construction vehicle entrance, grate inlet protection, truck wash down areas, and use of compost filter socks. Planting of landscaping also will be done as soon as possible on completed areas to help control erosion. Permanent sediment control measures will be used once construction is completed.

Coordination will be undertaken with the appropriate agencies during permitting and construction in order to ensure that the proposed project will not result in significant impacts with regard to surface and coastal waters. Any discharges related to project construction or operation activities will comply with applicable State Water Quality Standards as specified in Hawai'i Administrative Rules, Chapter 11-54 and 11-55 Water Pollution Control, Department of Health. Excavation and grading activities will be regulated by applicable provisions of the County's grading ordinance.

The drainage system for the proposed project will be designed to receive and detain or retain flows to allow percolation to occur within the project site such that no additional volume of discharge from the property would occur. Most of Ililani stormwater will be managed via Manufactured Treatment Device (MTD). A limited amount will be managed via landscaping due to limited available at grade open space.

3.15.4 Electrical and Communications Systems

Electrical power on the island of O‘ahu is provided by Hawaiian Electric Company Inc. (HECO). A significant electrical source for the project area is the Downtown Power Plant.

Telephone service in the area is provided by Hawaiian Telcom.

Spectrum and Hawaiian Telcom are Hawai‘i’s primary CATV providers.

Impacts and Mitigation Measures

In the short- and long-term, the proposed project is not anticipated to impact or increase overall demand on electrical and communication systems in the area.

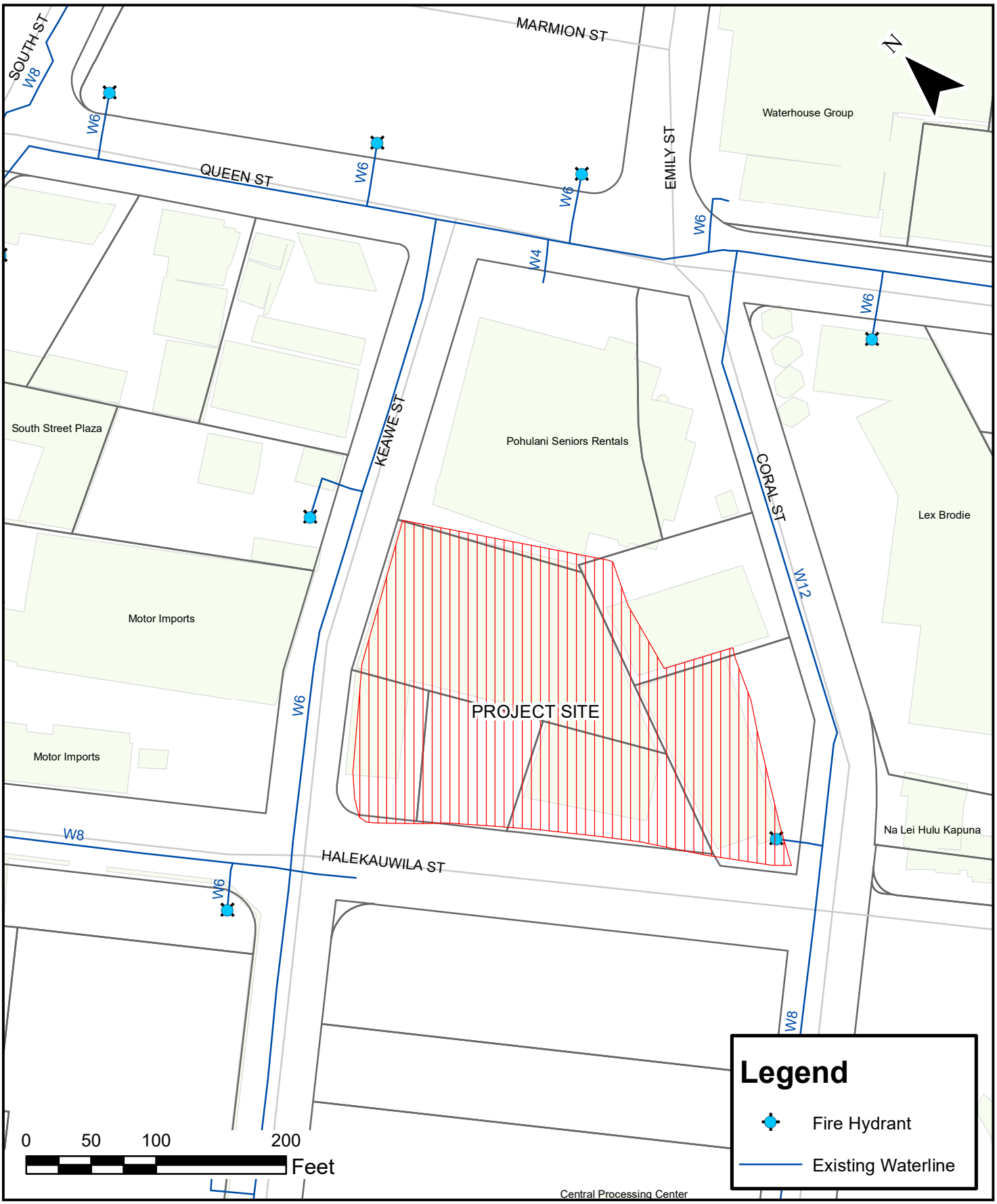

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FIGURE 3-5
WATER INFRASTRUCTURE

ILILANI ENVIRONMENTAL ASSESSMENT

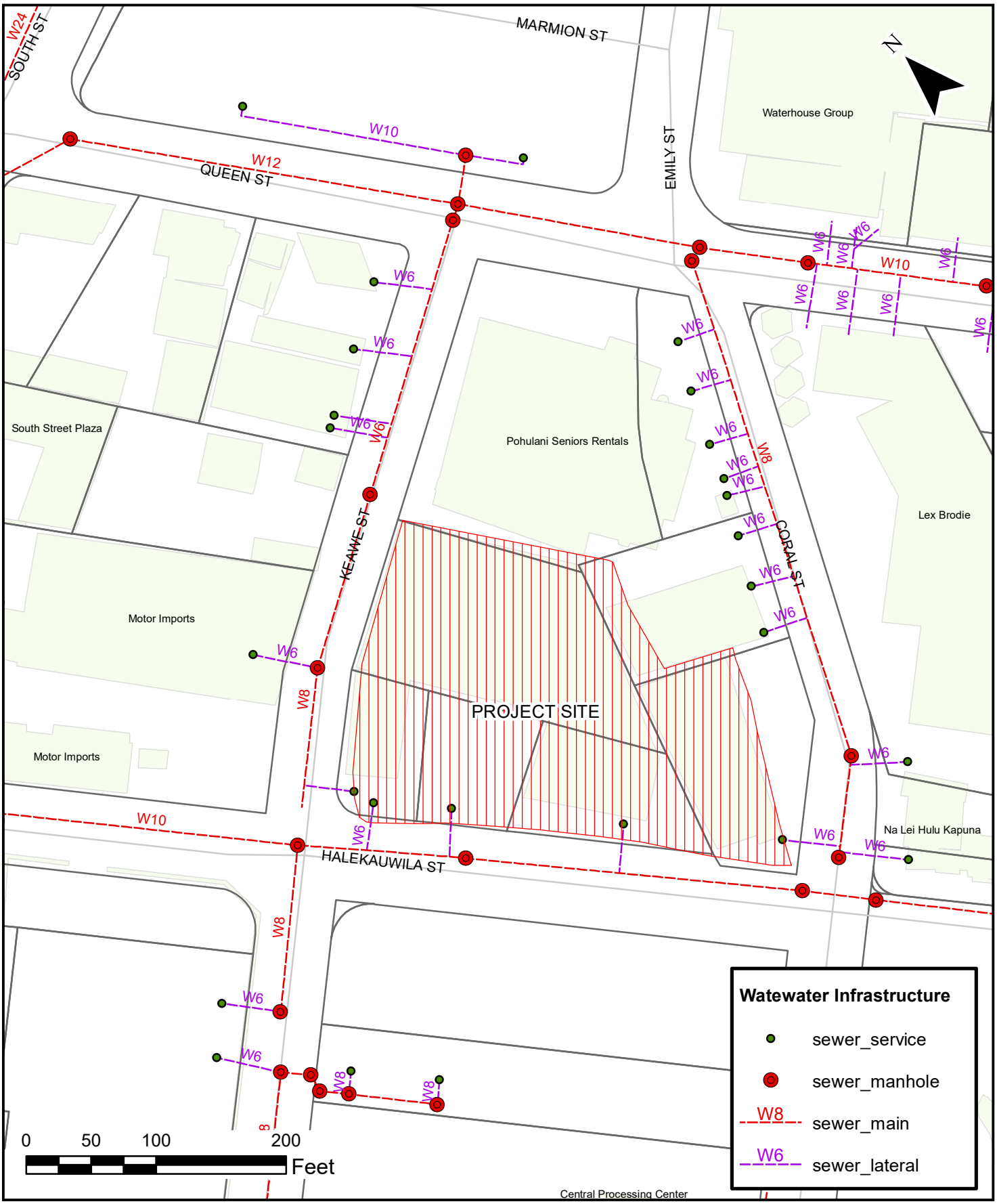

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FIGURE 3-6
SEWER INFRASTRUCTURE

ILILANI ENVIRONMENTAL ASSESSMENT

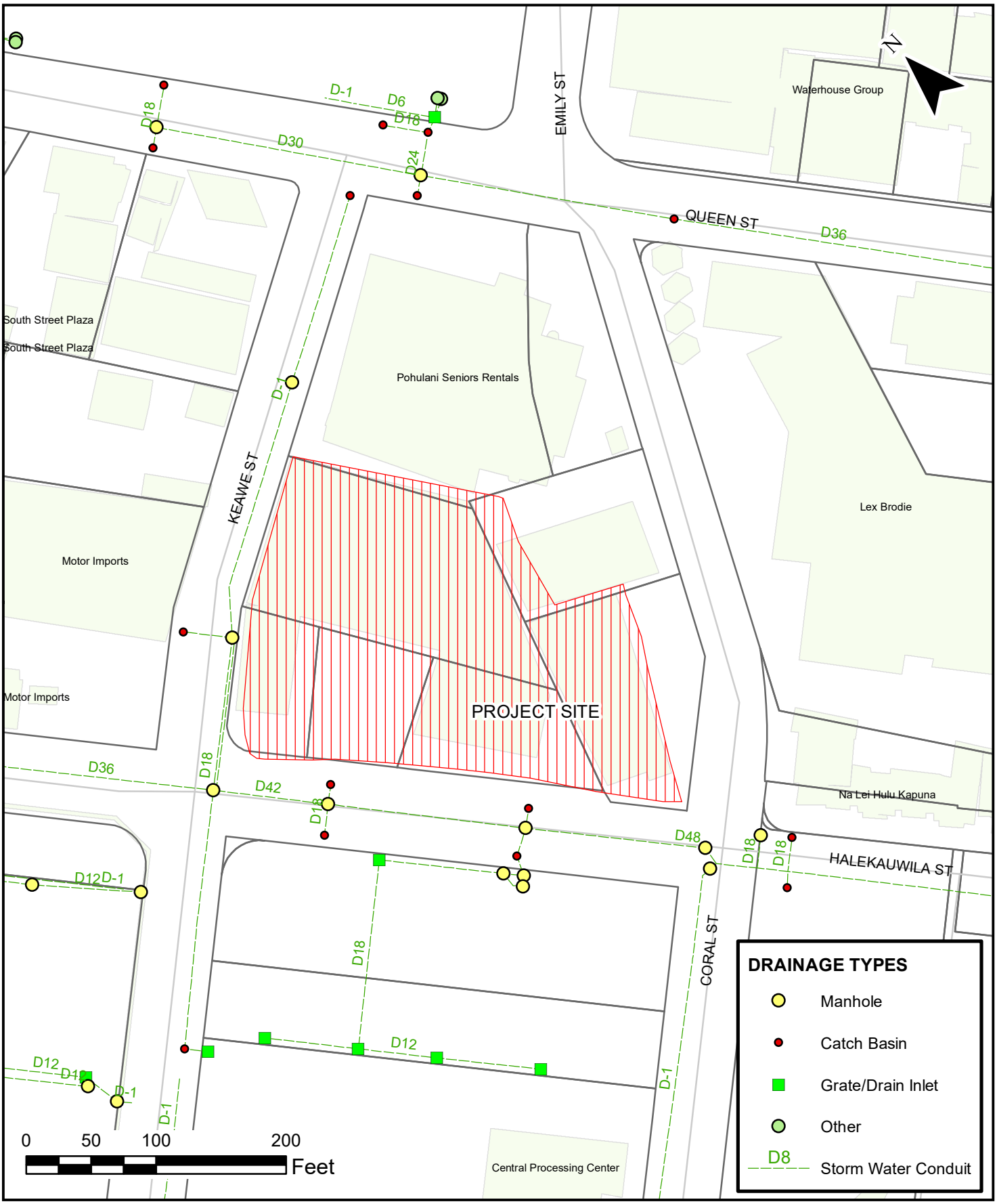

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FIGURE 3-7
DRAINAGE INFRASTRUCTURE

ILILANI ENVIRONMENTAL ASSESSMENT

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4. RELATIONSHIP TO PLANS, POLICIES, AND CONTROLS

This section discusses the State and City and County of Honolulu land use plans, policies and controls relating to the proposed project.

4.1 State Land Use Plans and Policies

4.1.1 Hawai‘i State Plan (Chapter 226, Hawai‘i Revised Statutes [HRS])

The Hawai‘i State Plan, Chapter 226, HRS, provides goals, objectives, policies, and priorities for the State. The Hawai‘i State Plan also provides a basis for determining priorities, allocating limited resources, and improving coordination of State and County Plans, policies, programs, projects, and regulatory activities. It establishes a set of themes, goals, objectives, and policies that are meant to guide the State’s long-range growth and development activities. The proposed project is consistent with the following applicable objectives and policies cited below:

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

(a) Planning for the State’s physical environment with regard to land-based shoreline, and marine resources shall be directed towards achievement of the following objectives:

(1) Prudent use of Hawai‘i’s land-based, shoreline, and marine resources.

(2) Effective protection of Hawai‘i’s unique and fragile environmental resources.

(b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:

(3) Take into account the physical attributes of areas when planning and designing activities and facilities.

(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.

(6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawai‘i.

(8) Pursue compatible relationships among activities, facilities, and natural resources.

Discussion:
No short- or long-term significant impacts on surface and/or coastal waters in the project vicinity are anticipated to result from the construction and operation of the proposed project. There are no streams or wetlands on or within close proximity to

the project site. Construction of the proposed project will not involve major land disturbing activities. Applicable erosion control measures and best management practices will be implemented in order to mitigate any possible adverse effects relating to runoff. As applicable for each phase, these may include but are not be limited to: temporary sediment basins, temporary diversion berms and swales to intercept runoff, silt fences, dust fences, slope protection, stabilized construction vehicle entrance, grate inlet protection, truck wash down areas, and use of compost filter socks. Planting of landscaping also will be done as soon as possible on completed areas to help control erosion. Permanent sediment control measures will be used once construction is completed.

Coordination will be undertaken with the appropriate agencies during permitting and construction in order to ensure that the proposed project will not result in significant impacts with regard to surface and coastal waters. Any discharges related to project construction or operation activities will comply with applicable State Water Quality Standards as specified in Hawai‘i Administrative Rules, Chapter 11-54 and 11-55 Water Pollution Control, Department of Health. Excavation and grading activities will be regulated by applicable provisions of the County’s grading ordinance.

No listed or protected plant species are known from the project area. Rare, threatened, or endangered fauna are not known to utilize the site for either habitat or foraging purposes. However, measures to prevent adverse effects to protected seabirds from night lighting will include the following:

(1) During construction activities, all nighttime lighting will be shielded and angled downward to reduce glare and disruption of bird flight.

(2) Following construction, permanent light sources will be shielded and angled downward to eliminate glare that could disturb or disorient seabirds in flight.

Sec. 226-19 Objectives and policies for socio-cultural advancement – housing.

(a) Planning for the State’s socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:

(1) Greater opportunities for Hawaii’s people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individual, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low-, and moderate-income segments of Hawaii’s population.

(2) The orderly development of residential areas sensitive to community needs and other land uses.

(b) To achieve the housing objectives, it shall be the policy of this State to:

(1) Effectively accommodate the housing needs of Hawaii’s people.

(2) Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.

(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.

(4) Promote appropriate improvement, rehabilitation, and maintenance of existing housing units and residential areas.

(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.

(6) Facilitate the use of available vacant, developable, and underutilized urban lands for housing.

(7) Foster a variety of lifestyles traditional to Hawai‘i through the design and maintenance of neighborhoods that reflect the culture and values of the community.

(8) Promote research and development of methods to reduce the cost of housing construction in Hawaii.

Discussion:

Ililani is envisoned to be a 42-story building offering approximately 328 affordable and market-priced housing units located in the Mauka Area of the Kaka‘ako Community Development District (KCDD), between Waikīkī and the Downtown/Capital District. The project will be in proximity to jobs, businesses, restaurants, recreation, entertainment, public transportation, and other social spaces.

A large percentage of recent projects in Kaka‘ako and in the neighboring Ala Moana district have targeted the upper-end, luxury markets. Ililani is unique in that it is providing quality affordable housing located in an area planned to become a vibrant community and support the lifestyle of urban dwellers.

Sec. 226-106 Priority Guidelines for the provision of affordable housing:

(1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.

(2) Encourage the use of alternative construction and development methods as a means of reducing production costs.

(4) Create incentives for development which would increase home ownership and rental opportunities for Hawai‘i's low- and moderate-income households, gap-group households, and residents with special needs.

(8) Give higher priority to the provision of quality housing that is affordable for Hawai‘i's residents and less priority to development of housing intended primarily for individuals outside of Hawai‘i.

Discussion:
The proposed Ililani project is in conformance with the priority guidelines set forth by Sec. 226-106 relating to Affordable Housing. The proposed action will address a recognized need for affordable and market rate housing opportunities that will allow households with limited housing prospects to live in a desirable mixed-use neighborhood with access to transit.

The 2017 State Housing Functional Plan, serves as a guide for implementing the housing goals and objectives of the Hawai‘i State Plan by providing specific strategies, policies and priority actions to address the current housing shortage in Hawai’i. The housing plan describes the benefits of homeownership for families and communities and notes that homeownership in Hawaii has been falling steadily since 2006. Objective B of the housing plan is to increase the homeownership rate by facilitating the private development of affordably priced for-sale residential units, particularly for moderate and above-moderate first-time homebuyers.

Discussion:
The proposed Ililani project is in conformance with Objective B of the State Housing Functional Plan. The proposed project will provide 328 for-sale housing units, of which 165 units will be affordable to households earning 80-140 percent of the area median income.

Section 226-108 Sustainability.

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

Discussion:
Sustainable features at Ililani will include low flow water fixtures, Energy Star appliances, LED lighting, energy efficient split air conditioning, high energy efficiency glazing, low VOC emission materials, concrete walls on mauka and Makai tower walls, light colored roofing, insulated exterior stud walls, several car recharging stations. Individually sub-metered condo units will encourage electricity conservation by apartment residents.

Managed parking similar to 801 South Street will increase utility of the Ililani parking structure during working hours, and do more with our built resources. The recreation deck is designed with planter boxes that AOAO owners can bid on to grow fruit and vegetables, the bid proceeds going to the AOAO. Bidding on planter box farming

rights will encourage only motivated farmers to use the garden boxes, and generate more productivity from the AOAO property.

4.1.2 State Land Use District (Chapter 205 Hawai‘i Revised Statutes [HRS])

The State Land Use Law, Chapter 205, HRS, is intended to preserve, protect and encourage the development of lands in the State for uses that are best suited to the public health and welfare of Hawai‘i’s people. Under Chapter 205, HRS, all lands in the State of Hawai‘i are classified by the State Land Use Commission (LUC) into one of four major categories of State Land Use Districts. These districts are identified as the Urban District, Agricultural District, Conservation District, and Rural District. Permitted uses within the districts are prescribed under Title 12, Chapter 205 (Land Use Commission), HRS, and the State Land Use Commission’s Administrative Rules prescribed under Title 15, Subtitle 3, Chapter 15 HAR.

Discussion:
The project site is located within the State Urban District (See Figure 4-1). Land uses in the Urban districts throughout the State are administered by the respective Counties in which they are located through their zoning codes. On O‘ahu, the City & County of Honolulu, Department of Planning and Permitting would generally administer zoning regulations under its Land Use Ordinance. The project site, however, is located within the jurisdiction of the HCDA, a State of Hawai‘i agency which regulates land within the Kaka‘ako Mauka and Makai areas (for further discussion see Section 4.1.4).

4.1.3 Hawai‘i Coastal Zone Management Program (Chapter 205A Hawai‘ Revised Statutes [HRS])

The National Coastal Zone Management (CZM) Program was created through passage of the Coastal Zone Management Act of 1972. Hawai‘i’s Coastal Zone Management (CZM) Program, established pursuant to Chapter 205A, HRS, as amended, is administered by the State Office of Planning (OP) and provides for the beneficial use, protection and development of the State’s coastal zone. The objectives and policies of the Hawai‘i CZM Program encompass broad concerns such as impact on recreational resources, historic and archaeological resources, coastal scenic resources and open space, coastal ecosystems, coastal hazards, and the management of development. The Hawai‘i CZM area includes all lands within the State and the areas seaward to the extent of the State’s management jurisdiction. Hence, the proposed project site is located in the CZM area. A discussion of the project’s consistency with the objectives and policies of the CZM Program is provided below.

(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

(i) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by: Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

(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 use 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; Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters.

(vi) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

(vii) 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 nearest public shoreline access is located at the Kaka‘ako Waterfront Park, located approximately a half mile to the south of the proposed project site.

No short- or long-term significant impacts on surface and/or coastal waters in the project vicinity are anticipated during construction or operation of the proposed project. There are no streams or wetlands on or within close proximity to the project site. Applicable erosion control measures and best management practices will be implemented in order to mitigate any possible adverse effects relating to runoff. As applicable for each phase, these may include but are not be limited to: temporary sediment basins, temporary diversion berms and swales to intercept runoff, silt fences, dust fences, slope protection, stabilized construction vehicle entrance, grate inlet protection, truck wash down areas, and use of compost filter socks. Planting of landscaping also will be done as soon as possible on completed areas to help control erosion. Permanent sediment control measures will be used once construction is completed.

Coordination will be undertaken with the appropriate agencies during permitting and construction in order to ensure that the proposed project will not result in significant impacts with regard to surface and coastal waters. Any discharges related to project construction or operation activities will comply with applicable State Water Quality Standards as specified in Hawai‘i Administrative Rules, Chapter 11-54 and 11-55 Water Pollution Control, Department of Health. Excavation and grading activities will be regulated by applicable provisions of the County’s grading ordinance.

(2) *Historic Resources*

Objective:

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

Policies:

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

Discussion:

Current AIS investigation efforts for the subject project are ongoing. To fulfill the requirements set forth by HAR §13-276, the proposed project will comply with all recommendations made under the AIS and SHPD’s approval of that document and process. Consequently, the proposed project will avoid significant impacts on historic and archaeological resources.

As a result of consultation with the SHPD's Architecture Branch regarding potential impacts to standing architecture that is older than 50 years and that could be significant architectural historic properties, Mason Architects prepared an architectural reconnaissance level survey (RLS) in 2017 for the project area's standing architecture. The RLS concluded that the project area's standing architecture did not constitute significant architectural historic properties.

(3) *Scenic and Open Space Resources*

Objective:

(A) Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

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

(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and

(D) Encourage those developments which are not coastal dependent to locate in inland areas.

Discussion:

The proposed improvements are not anticipated to have significant impacts on notable view planes nor adversely affect important public viewing points or visual resources, as identified in the Mauka Area Plan.

(4) Coastal Ecosystems

Objective:

(A) 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 nearest coastal water offshore of the project site is Kewalo Basin, located approximately 0.35-miles to the south of the project site.

During construction of the various improvements, storm water runoff may carry increased amounts of sediment into the storm drain system due to erosion from soils exposed during excavation and grading activities. This runoff could potentially impact the water quality of coastal waters in the area. However, excavation and grading activities associated with the construction of the proposed project will be regulated by the County's grading ordinance. Mitigation measures will be instituted in accordance with site-specific assessments, incorporating appropriate structural and/or non-structural BMPs such as minimizing time of exposure between construction and landscaping, and implementing erosion control measures such as silt fences and sediment basins. Following the associated construction activity, the excavated areas will be paved over or backfilled to its graded contours or re-vegetated to control erosion.

Coordination will be undertaken with the appropriate agencies during permitting and construction in order to ensure that the proposed project will not result in significant impacts with regard to surface and coastal waters. Any discharges related to project construction or operation activities will comply with applicable State Water Quality Standards as specified in Hawai‘i Administrative Rules, Chapter 11-54 and 11-55 Water Pollution Control, Department of Health. Excavation and grading activities will be regulated by applicable provisions of the County's grading ordinance.

(5) *Economic Uses*

Objective:

(A) 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 developments such as harbors and ports, and coastal related development such as visitor 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:

In the short-term, construction expenditures will provide positive benefits to the local economy. This would include creation of some construction and construction support jobs, and the purchase of materials from local suppliers, as well as indirect benefits to local retail businesses resulting from construction activities.

In the long-term, the proposed Ililani project will expand Honolulu's housing inventory and provide significant, in-demand housing opportunities for Honolulu's urban workforce.

(6) *Coastal Hazards*

Objectives:

(A) 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 pollution hazards;
(B) Ensure that developments comply with requirements of the Federal Flood Insurance Program;
(C) Prevent coastal flooding from inland projects.

Discussion:
According to the *Flood Insurance Rate Maps* prepared by the Federal Emergency Management Agency, the project site is designated Zone X. Zone X includes areas subject to 500-year floods, areas of 100-year floods with average depths of less than 1-foot, or areas with drainage areas less than 1 square mile.

According to the Tsunami Evacuation Zone maps for O‘ahu, the project site lies entirely within the extreme tsunami evacuation zone.

Construction and operation of the proposed improvements are not anticipated to increase flood risks or cause any adverse flood-related impacts at the project site or lower elevation properties.

(7) Managing Development

Objective:
(A) Improve the development review process, communication, and public participation in the management of coastal resource 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:
The Hawai‘i State environmental review process, HRS 343, requires project review by government agencies and affords the public the opportunity to provide comments on the proposed project. Applicable State and County requirements will be adhered to in the design and construction phases of the proposed improvements.

In addition, the project design requires the Development Team to apply to the Hawai‘i Housing Finance and Development Corporation (HHFDC) for qualification under Chapter 201H, HRS, along with exemptions from statutes, rules and ordinances pursuant to Section 201H-38, HRS.

(8) Public Participation

Objective:
(A) 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 mediations to respond to coastal issues and conflicts.

Discussion:
The Hawai‘i State environmental review process, Chapter 343, HRS, provides opportunities for project review by government agencies and affords the public the opportunity to provide comments on the proposed project.

(9) Beach Protection

Objective:
(A) 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 proposed improvements do not involve the construction of improvements in the shoreline setback nor require any shoreline erosion-protection structures.

(10) Marine Resources

Objective:
(A) Promote the protection, use, and development of marine and coastal resources to assure their sustainability.
Policies:
(D) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

(E) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;

(F) 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;

(G) 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

(H) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Discussion:

The proposed improvements do not involve construction or development within coastal waters and are, therefore, not anticipated to have any direct impacts on marine and coastal resources.

No short- or long-term significant impacts on surface and/or coastal waters in the project vicinity are anticipated during construction or operation of the proposed project. There are no streams or wetlands on or within close proximity to the project site. Construction of the proposed project will not involve major land disturbing activities. Applicable erosion control measures and best management practices will be implemented in order to mitigate any possible adverse effects relating to runoff. As applicable for each phase, these may include but are not be limited to: temporary sediment basins, temporary diversion berms and swales to intercept runoff, silt fences, dust fences, slope protection, stabilized construction vehicle entrance, grate inlet protection, truck wash down areas, and use of compost filter socks. Planting of landscaping also will be done as soon as possible on completed areas to help control erosion. Permanent sediment control measures will be used once construction is completed.

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No listed or protected plant species are known from the project area. Rare, threatened, or endangered fauna are not known to utilize the site for either habitat or foraging purposes. However, measures to prevent adverse effects to protected seabirds from night lighting will include the following:

(1) During construction activities, all nighttime lighting will be shielded and angled downward to reduce glare and disruption of bird flight.

(2) Following construction, permanent light sources will be shielded and angled downward to eliminate glare that could disturb or disorient seabirds in flight.

4.1.4 Kaka‘ako Mauka Area Plan And Mauka Area Plan Rules

The HCDA was created by the 1976 State Legislature to bring about the timely planning, regulation and development of underutilized areas in the State. The 670-acre Kaka‘ako District was designated as the HCDA’s first “Community Development District.” Separate plans specifying desired land uses, urban design guidelines, infrastructure improvements, and phasing have been prepared for the Mauka area and Makai area. The latest plan for the Kaka‘ako Mauka Area was adopted by the HCDA in 2011.

The principles of the Mauka Area Plan are: (1) develop urban village neighborhoods where people can live, work, shop and recreate; (2) create great places, such as venues for performance and entertainment, or quiet places to sit and read; and (3) make the connection, which is to find balance between modes of transportation in addition to vehicular traffic.

Objectives of the Mauka Area Plan relate to: (1) urban design; (2) parks, open space and views; (3) transportation; (4) reserved housing; (5) historic and cultural resource plan; (6) social and safety plan; (7) relocation plan; (8) public facilities program; and (9) infrastructure and improvement district program.

The proposed project is being designed to conform to the Mauka Area Plan and Rules. The Mauka Area Plan identifies the project site as being within the “Pauahi Neighborhood” of the Mauka Area which is designated as a “mixed-use urban village” (See Figure 4-1).

4.1.5 Kaka‘ako Transit Oriented Development Overlay Plan

In 2012, the Honolulu City Council approved an elevated fixed rail system to extend from East Kapolei to Ala Moana Center in Honolulu. Of the 21 transit stations in this segment, three of the stations are located in the Kaka‘ako Community Development District (KCDD). This prompted the HCDA to develop its Transit-Oriented Development (TOD) Overlay Plan and Rules for the KCDD. The new plan and rules would be enacted as an “overlay” to the existing Mauka and Makai district rules.

The TOD Overlay Plan represents a comprehensive analysis of the issues and opportunities associated with TOD in Kaka`ako. The Plan and Rules enhance the policies and direction set forth in the previously established district plans and rules by maximizing development through the use of smart growth principles, multi-modal transportation, and walkable neighborhood design. The intent of the TOD Overlay Plan is to foster development that creates well-used and well-loved urban places that are safe, comfortable, diverse, attractive and representative of the diverse character in the Kaka`ako community, while providing safe and comfortable streets and convenient access to the district’s three future Honolulu Authority for Rapid Transit (HART) stations.

The KCDD has nine neighborhoods each with their own emerging character predominant land use. The TOD Overlay plan identifies the subject project as located within the Pauahi neighborhood (see Figure 4-1). The TOD Overlay Plan envisions the integration of the Complete Streets concept throughout the Mauka and Makai Districts.

The proposed project is consistent with the vision for Complete Streets set forth by the TOD Overlay plan, which embraces a multimodal approach to street design and operation to simultaneously address congestion, maximize use of existing rights-of-way, help build a transit-oriented community, and facilitate district access. Project streets are classified as “Commercial / Industrial Streets” by the TOD Overlay Plan (see Figure 4-2).

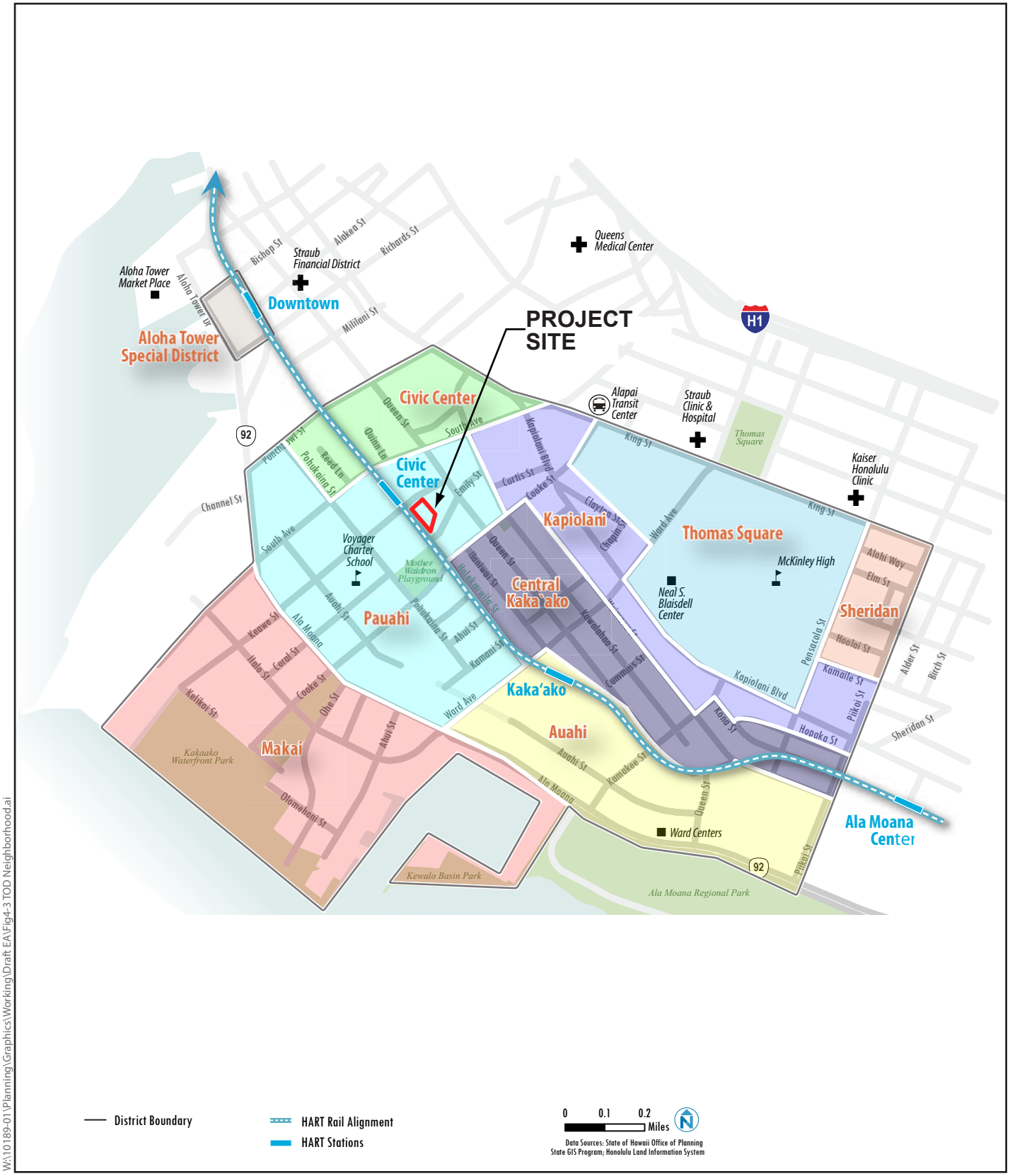

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FIGURE 4-1

TOD NEIGHBORHOOD MAP

ILILANI ENVIRONMENTAL ASSESSMENT

WILSON OKAMOTO CORPORATION

Street Typology

Commercial Boulevard and Avenue
- Regional Boulevard
- Transit Boulevard
- Commercial Avenue

District Streets
- Commercial / Industrial Street
- Residential Street

Distinguished Streets
- Promenade
- Rapid Transit Street

Local Streets
- Local Streets

- HART Rail Alignment
- HART Stations
- Pathway
- Project Boundary

0 0.1 0.2 Miles

Data Sources: State of Hawaii Office of Planning

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FIGURE 4-2

TOD STREET TOPOLOGY CLASSIFICATION MAP

ILILANI ENVIRONMENTAL ASSESSMENT

WILSON OKAMOTO CORPORATION

4.1.6 Special Management Area Designation

Pursuant to the Hawai‘i CZM Program, Chapter 205A, HRS, the counties have enacted ordinances establishing their respective Special Management Areas (SMA). The City and County of Honolulu enacted its SMA ordinance as Chapter 25, Revised Ordinances of Honolulu. Any “development” within its geographically defined SMA (See Figure 4-3) requires an SMA Use Permit. Administration of the SMA Use permit process within the Kaka‘ako Community Development District, however, lies with the State Office of Planning (OP). The project site is not located within the SMA.

4.2 City and County of Honolulu Land Use Plans and Policies

4.2.1 City and County of Honolulu General Plan

The City and County of Honolulu last updated its General Plan in October of 2002. The General Plan for the City and County of Honolulu is a written commitment by the City and County government to a future for the Island of Oahu that it considers desirable and attainable. The Plan is a two-fold document: First, it is a statement of the long-range social, economic, environmental, and design objectives for the general welfare and prosperity of the people of Oahu. These objectives contain both statements of desirable conditions to be sought over the long run and statements of desirable conditions that can be achieved within an approximately 20-year time horizon. Second, the General Plan is a statement of broad policies that facilitate the attainment of the objectives of the Plan.

The General Plan is a guide for all levels of government, private enterprise, neighborhood and citizen groups, organizations, and individual citizens in eleven areas of concern:

(1) Population;
(2) Economic activity;
(3) Natural environment;
(4) Housing,
(5) Transportation and utilities;
(6) Energy;
(7) Physical development and urban design;
(8) Public safety;
(9) Health and education;
(10) Culture and recreation; and
(11) Government operations and fiscal management.

While Ililani is relevant and consistent with virtually all of the 11 sections of the General Plan, the following applicable goals, objectives, policies, and actions of the City and County of Honolulu General Plan have been selected on the basis of their applicability for further discussion within this document:

I. Population

Objective C: *To establish a pattern of population distribution that will allow the people of O‘ahu to live and work in harmony.*

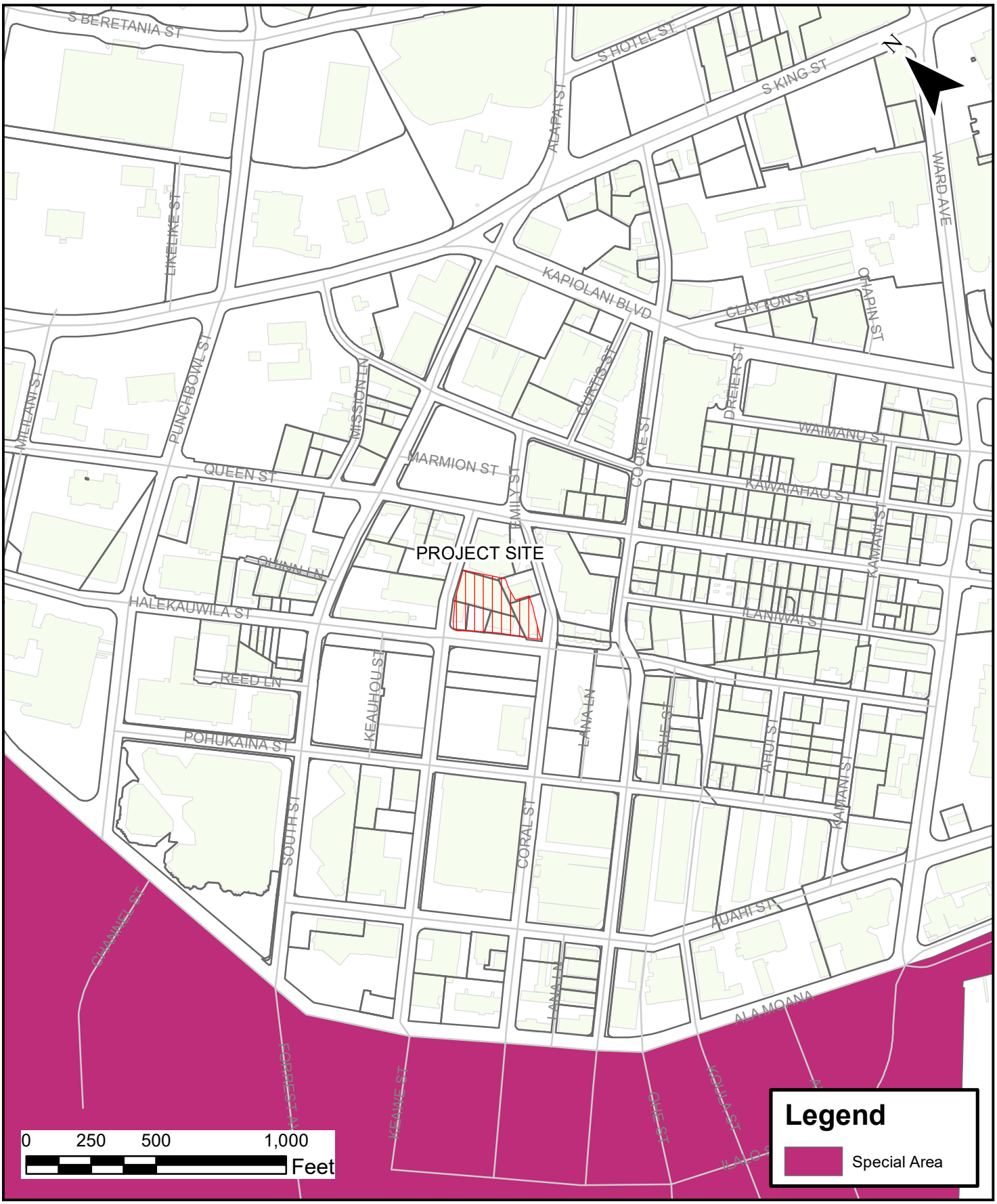

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FIGURE 4-3
SPECIAL MANAGEMENT AREA MAP

ILILANI ENVIRONMENTAL ASSESSMENT

Policy 1: Facilitate full development of the Primary Urban Center

Discussion:
Ililani is in conformance with the Population objectives and policies set forth by the City and County of Honolulu's General Plan. The project is located in the Primary Urban Center (PUC) and will facilitate opportunities for low to moderate income households to live in the PUC near businesses, public transportation, and other urban community lifestyle amenities. The project facilitates the full development of the PUC by providing opportunities for an important portion of the residential market to live in the PUC, located near commercial and family-oriented services, contributing to the economic and social activity essential to the area.

IV. Housing

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

Policy 1
Develop programs and controls which will provide decent homes at the least possible cost.

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

Policy 7
Provide financial and other incentives to encourage the private sector to build homes for low and moderate-income residents.

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

Policy 13
Encourage the provision of affordable housing designed for the elderly and the handicapped.

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

Policy 1
Encourage residential developments that offer a variety of homes to people of different income levels and to families of various sizes

Policy 3
Encourage residential development near employment centers

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

Discussion:
The proposed Ililani project is in conformance with the Housing objectives and policies set forth by the City and County of Honolulu's General Plan. The proposed action will address a recognized need for affordable and market rate housing opportunities that will allow households with limited housing prospects to live in a desirable mixed-use neighborhood with access to transit, offering alternatives to private modes of transportation, supporting a more efficient use of the street system in the area.

VII. Physical Development and Urban Design

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

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

Policy 5
Provide for more compact development and intensive use of urban lands where compatible with the physical and social character of existing communities.

Objective E
To create and maintain attractive, meaningful, and stimulating environments throughout O'ahu

Policy 3
Encourage distinctive community identities for both new and existing districts and neighborhoods.

Discussion:
The proposed Ililani project is in conformance with the Physical Development and Urban Design objectives and policies set forth by the City and County of Honolulu's General Plan. Ililani project, along with the other structures in the area, will contribute to the ongoing development of O'ahu's Primary Urban Center. It is designed to be attractive and create a sense of place and identity with the developing City TOD concepts and Kaka'ako's Mauka Area Plan.

4.2.2 Primary Urban Center Development Plan

The project site is located within the Primary Urban Center (PUC) Development Plan (DP) area, which extends from downtown Honolulu to Pearl City in the west to Wai'alae-Kahala in

the east. The PUC is home to almost half of O‘ahu’s population and three quarters of all jobs. The *Primary Urban Center Development Plan* (June 2004) provides a vision for the PUC in the areas of land use, transportation, infrastructure, and public facilities. It also provides policies and guidelines for achieving that vision. The proposed project is consistent with the following guidelines, policies and principles contained in the PUC Development Plan:

Cultivating Livable Neighborhoods

- *Cultivate existing and new “neighborhood centers”*
- *Promote mixed land uses*
- *Make streets “pedestrian-friendly”*

In-Town Housing Choices

- *Promote people-scaled apartment and townhouse dwellings in low-or mid-rise buildings oriented to the street*
- *Improve the feasibility of redeveloping small lots*
- *Reduce costs for apartment homes*
- *Provide incentives and cost savings for affordable housing*
- *Provide for high-density housing options in mixed-use developments around transit stations.*

Discussion:
In the long-term, the proposed Ililani project will expand the inventory of affordable and market rate for-sale housing inventory in Honolulu’s urban core. By providing housing options to Honolulu’s urban workforce, Ililani will serve to solidify a neighborhood center in the rapidly changing Kaka‘ako Mauka area. Due to its proximity to a planned transit station, the subject project will have potential for utilization of the Honolulu-High-Capacity Transit Corridor project. Overall, the relationship between in-town housing and rail is mutually supportive and consistent with the objectives of Transit-Oriented Development.

4.2.3 City and County of Honolulu Zoning

The purpose and intent of the City and County of Honolulu Land Use Ordinance 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.

Discussion:
According to the City and County of Honolulu Department of Planning and Permitting (DPP), the project site is zoned as part of the Kaka‘ako Community Development District (See Figure 4-4). On O‘ahu, the City & County of Honolulu, Department of Planning and Permitting would generally administer zoning regulations under its Land Use Ordinance. The project site, however, it located within the jurisdiction of the HCDA, a State of Hawai‘i agency which regulates land within the Kaka‘ako Mauka and Makai areas (for further discussion see Section 4.1.4).

4.3 Permits and Approvals

The 201H application process requires routing of requested exemptions under HRS 201H to all departments and agencies with authority over the exemptions, for comments. The following is a list of permits, approvals, and reviews that may be required prior to construction and operation of the proposed project.

This Draft EA will be routed to agencies (with a master list of agencies included in Appendix G) for official comment on the 201H application and requested exemptions. After receiving comments from all involved agencies and making any necessary revisions, Applicant will proceed with the 201H approval process.

The permits and responsible agencies required for the implementation of the proposed project are as follows:

<u>Federal</u>

- Federal Aviation Administration (FAA) Form 7460-1, "Notice of Proposed Construction or Alteration"

<u>State of Hawai‘i</u>

Department of Land and Natural Resources

- Conservation District Use Permit
- Chapter 6E, HRS, State Historic Preservation Law

Department of Health

- National Pollutant Discharge Elimination System
- Disability and Communication Access Board
- Pollution Control - Noise Permit
- Water Quality

Hawai‘i Community Development Authority

- Development Permit

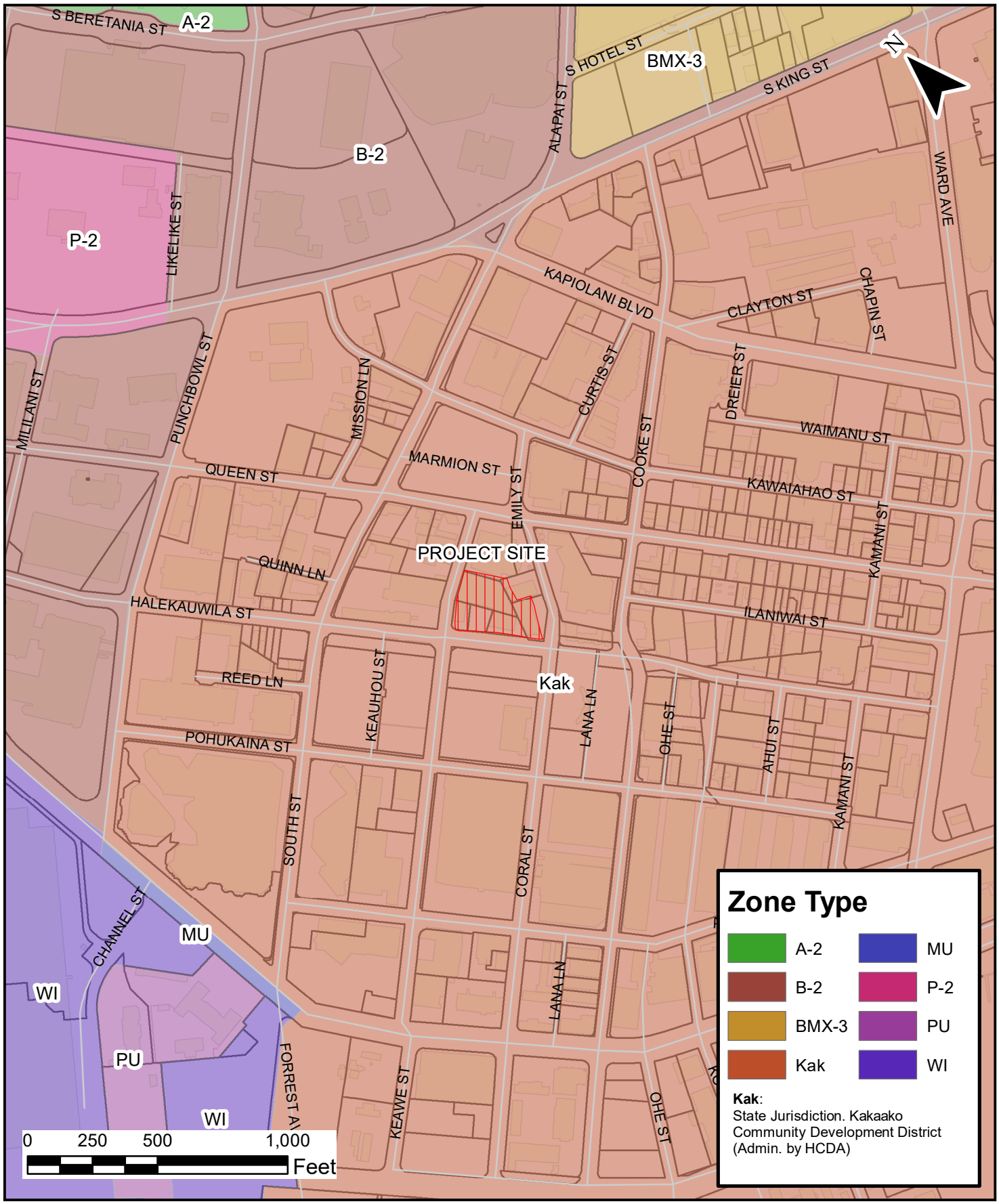
Hawai‘i Housing Finance and Development Corporation

- Chapter 201H, HRS exemptions from statutes, ordinances and rules
- Dwelling Unit Revolving Fund interim construction loan

<u>City and County of Honolulu</u>

Department of Planning and Permitting

- Building Permit



WILSON OKAMOTO CORPORATION

FIGURE 4-4
CITY AND COUNTY OF HONOLULU ZONING MAP

ILILANI ENVIRONMENTAL ASSESSMENT

City and County of Honolulu (Continued)

- Grading Permit/Trenching Permit
- Certificate of Occupancy
- Construction Dewatering
- Wastewater Sewer Connection
- Stormwater Drain Connection
- Excavation and Repair of Streets and Sidewalks

Board of Water Supply

- Water Connection

Department of Transportation

- Street Usage Permit

Honolulu Fire Department

- Plan Review

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5. ALTERNATIVES ELIMINATED FROM CONSIDERATION

Hawai‘i Administrative Rules (HAR) § 11-200-10 (1996) requires an environmental assessment to identify and consider alternatives to the proposed action.

5.1 No Action Alternative

Under the No Action Alternative, the proposed Ililani project would not be constructed, and the project site would remain in its present condition as a vacant commercial structure.

The no-action alternative would preclude permit approvals, as well as costs for design and construction which would otherwise be required for the proposed project improvements.

This alternative would fail to satisfy the purpose and need of the proposed action, and thus is not a feasible alternative.

5.2 Other Alternatives

Other alternatives beyond the non-action alternative were considered, but eliminated from further consideration for this project.

Alternative density and design configurations were considered under the scope of the proposed action however, the proposed design scheme density was selected to serve as the basis of impact assessment.

Included among these alternative configurations was the potential construction of an additional parking structure, on state land, at the neighboring “Fiddlesticks” site at 606 Coral Street to provide supplemental parking to the proposed Ililani project and other HHFDC uses in the region. The project was envisioned to encompass approximately 5,700 s.f. of parking floor plate ranging at a height of 4 to 6 stories. This separate, alternate project is not being pursued under this proposal due to (but not solely limited to) scheduling and resource allocation constraints and conflicts.

This alternative would afford more day parking for HHFDC staff, freeing up parking spaces for 20 or more additional renters at the adjacent Pohulani rental tower, and provide more parking for Ililani residents who wish to park more than 1 car. This is a low impact project across the street from Lex Brodie which can increase the living and work assets available to respective Pohulani and Ililani residents and HHFDC staff.

606 Coral Street was considered for additional land and building envelope, but found to be encumbered by lease and not available for purchase in a timely manner. 606 Coral Street as a leasehold property would not satisfy Ililani’s for sale fee project basis.

The Ililani project on TMKs 2-1-051: 011 and 012 best meets the project objectives.

Economic feasibility: Ililani is a small footprint high density efficient 42 story tower on a compact land parcel that yields reasonable land and construction cost per housing unit,

Greatest amount of certainty: Ililani is similar to 201H project Kapiolani Residences in pricing, density, and cost. Kapiolani Residences sold out very quickly, indicating high likelihood of success for Ililani.

Least impact on the environment: Ililani uses little land for a lot of housing in prime Honolulu location. Near downtown and Ala Moana Shopping Center and the HART Civic Center station, Ililani encourages in-town work and living that requires less driving, and more walking activities. Ililani is designed with efficient tunnel form construction, sustainable low energy and low water consumption systems, low $300 per month maintenance cost, and AOA gardening that encourages saving money, water, electricity, and greater self-sufficiency by growing your own food. Managed shared parking means serving more people with less, and being adaptable over time as peoples driving and parking habits evolve. Ground floor commercial provides easy access to food, beverage, and other services. In land constrained Honolulu, Ililani builds housing vertically, avoiding use of scarce Oahu agricultural land.

6. ANTICIPATED DETERMINATION OF FONSI

The proposed project involves the following improvements:

Potential impacts of the proposed improvements have been evaluated in accordance with the significance criteria of §11-200-12 of the Department of Health's Administrative Rules. Discussion of the project's conformance to the criteria is presented as follows:

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

No natural or cultural resources of significance were identified on the proposed project site, which is comprised of fill land. Given the project's location in urban Honolulu, project activities are unlikely to result in the loss or destruction of any natural or cultural resource. In the event of unexpected discovery of historic or archaeological resources, the SHPD will be immediately notified for appropriate response and action.

Current AIS investigation efforts or the subject project are ongoing. To fulfill the requirements set forth by HAR §13-276, the proposed project will comply with all recommendations made under the AIS and SHPD's approval of that document and process. Consequently, the proposed project will avoid significant impacts on historic and archaeological resources.

As a result of consultation with the SHPD's Architecture Branch regarding potential impacts to standing architecture that is older than 50 years and that could be significant architectural historic properties, Mason Architects prepared an architectural reconnaissance level survey (RLS) for the project area's standing architecture. The RLS concluded that the project area's standing architecture did not constitute significant architectural historic properties.

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

The proposed project will not curtail the range of beneficial uses of the environment such as agricultural lands, natural habitats, or areas of biological significance. In land constrained Honolulu, Ililani builds housing vertically, avoiding use of scarce Oahu agricultural land. Ililani builds 42 stories up instead of spreading out, using 0.75 acres of land instead of say 31 acres. Ililani is centrally located in Honolulu incurring less driving, generating less CO2, and expending less human hours to travel to daily destinations. AOA gardening on-site encourages more self-sufficiency and less buying from stores. Parking in an eight story parking structure avoids spreading car parking out on eight times the same land footprint. Managed parking provides around 150 parking spaces during office hours available to people wanting to park nearby.

(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;

Specifically, short term construction environmental impacts will include negligible soil loss and erosion during construction activities. Control of this erosion loss will include a perimeter silt fence surrounding the construction boundary. Temporary stabilization including onsite planting and a base course (gravel) cover will be utilized as needed. City and County and Department of Health requirements defined as "Best Management Practices" will be integrated into construction activities. All grading operations will proceed in compliance with dust, erosion control and all City and County Grading Ordinance and the State of Hawaii Administrative Rules, Section 1-60, 1-33 applicable to fugitive dust.

The proposed project will involve grading and site preparation for new paved areas and building footings, no major topographical changes are anticipated. Detailed design of the site will take into consideration the groundwater level and the potential for its rise. It is anticipated that the new underground wet utility systems that will be installed (water, sewer, and drainage) will not be impacted by sea level rise, due to the design of finished grades and topography, and the inland location of the site

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

In the short term, construction expenditures will provide positive benefits to the local economy. This would include creation of some construction and construction support jobs, and the purchase of materials from local suppliers, as well as indirect benefits to local retail businesses resulting from construction activities, but not at a level that would generate any significant population expansion.

In the long-term, the proposed project will provide in-demand housing opportunities for Honolulu's urban workforce. Ililani will increase Honolulu real property inventory by 328 units, and converts 30,000 s.f. of low rent warehouse to 5,559 s.f. of mid-market higher revenue commercial space. Ililani will increase tax revenues from construction activity and employment. The Ililani commercial spaces will employ more workers and generate more sales than the existing warehouses, generating more taxes and increasing property tax values.

(5) Substantially affects public health;

No identifiable adverse short- or long-term impacts on public-health are anticipated to result from the construction and operation of the proposed project. Typical short-term construction-related impacts (e.g., noise and air quality) are anticipated however, they will be temporary in nature and will comply with State and County regulations.

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

Substantial impacts to public facilities are not anticipated to result from the construction and operation of the proposed project. Moreover, the proposed project is not anticipated to induce population growth in the area or region. Existing public water, wastewater, drainage, and utility infrastructure are expected to have sufficient capacity to serve project demands. Agencies with jurisdiction over their respective

infrastructure systems will be consulted as the project proceeds to assure that it can be accommodated.

(7) Involves a substantial degradation of environmental quality;

The proposed project is not anticipated to substantially degrade environmental quality. Long-term impacts to air and water quality, noise levels and natural resources will be minimal. Typical short-term construction-related impacts (e.g., noise and air quality) are anticipated, but will be temporary and will comply with State and County regulations.

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

The proposed action does not have a considerable effect upon the environment. There are no commitments for further action beyond the scope presented within this EA.

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

No listed or protected plant species are known to be present in the project area. Rare, threatened, or endangered fauna are not known to utilize the site for either habitat or foraging purposes.

Although there is no evidence of migratory seabirds and native waterfowl species using the project site for breeding or habitation, some are known to visit areas within the wider project study area. No adverse impacts resulting from the project are anticipated. However, measures to prevent adverse effects to avifauna from night lighting will include the following:

- During construction activities, all nighttime lighting will be shielded and angled downward to reduce glare and disruption of bird flight.
- Following construction, permanent light sources will be shielded and angled downward to eliminate glare that could disturb or disorient animals.

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

No long-term significant impacts to air quality, water quality, or noise levels within the project site are anticipated as a result of the construction and operation of the proposed project.

In the short- and long-term, no significant impacts on air quality are anticipated as a result of the construction and operation of the proposed project. A portion of the construction for the proposed project will involve fine grading as well as limited excavation for utility lines and fencing. Fugitive dust will be controlled, as required, by methods such as dust fences, water spraying and sprinkling of loose or exposed soil or ground surface areas. As deemed appropriate, planting of landscaping will be done as soon as possible on completed areas to also help control dust. Respective contractors will be responsible to minimize air quality impacts during the various phases of construction.

Exhaust emissions from construction vehicles are anticipated to have negligible impact on air quality in the project vicinity as the emissions would be relatively small and readily dissipated. In the long-term, some vehicular emissions related to operations at the project site are expected, however, due to the generally prevailing tradewinds, the emissions would be readily dissipated.

No short- or long-term significant impacts on surface and/or coastal waters in the project vicinity are anticipated during construction or operation of the proposed project. There are no streams or wetlands on or within close proximity to the project site. Construction of the proposed project will not involve major land disturbing activities. Applicable erosion control measures and best management practices will be implemented in order to mitigate any possible adverse effects relating to runoff. As applicable for each phase, these may include but are not be limited to: temporary sediment basins, temporary diversion berms and swales to intercept runoff, silt fences, dust fences, slope protection, stabilized construction vehicle entrance, grate inlet protection, truck wash down areas, and use of compost filter socks. Planting of landscaping also will be done as soon as possible on completed areas to help control erosion. Permanent sediment control measures will be used once construction is completed.

Coordination will be undertaken with the appropriate agencies during permitting and construction in order to ensure that the proposed project will not result in significant impacts with regard to surface and coastal waters. A National Pollutant Discharge Elimination System (NPDES) permit for storm water runoff from construction activities would be required as individual and/or cumulative soil disturbances on the project site will exceed one acre of land area. Any discharges related to project construction or operation activities will comply with applicable State Water Quality Standards as specified in Hawai‘i Administrative Rules, Chapter 11-54 and 11-55 Water Pollution Control, Department of Health. Excavation and grading activities will be regulated by applicable provisions of the County’s grading ordinance.

In the short- and long-term, no significant impacts on air quality are anticipated as a result of the construction and operation of the proposed project. A portion of the construction for the proposed project will involve fine grading as well as limited excavation for utility lines and fencing. Fugitive dust will be controlled, as required, by methods such as dust fences, water spraying and sprinkling of loose or exposed soil or ground surface areas. As deemed appropriate, planting of landscaping will be done as soon as possible on completed areas to also help control dust. Respective contractors will be responsible to minimize air quality impacts during the various phases of construction.

Land disturbing activities include demolition, foundation work, utility repairs, and utility upgrades.

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

No short- or long-term significant impacts are anticipated as the project site is not located within an environmentally sensitive area.

According to the FIRM, the project site is designated Zone X, an area determined to be outside of the 0.2% annual chance floodplain. There are no base flood elevations or depths shown within this zone.

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

The proposed project will not result in significant impacts to view planes identified in county or state plans or studies. Moreover, the proposed project is not expected to adversely affect scenic and visual resources in the project area. The proposed Ililani project will not degrade lateral coastal views or mauka-makai views from areas in the vicinity of the site.

(13) Requires substantial energy consumption.

The construction and operation of the proposed project will not require more energy than used for comparable projects. Post construction, project electricity and water use will be lower per resident than older projects due to installation of LED light fixtures, Energy Star appliances, energy efficient split air conditioning units, and individual sub-metering of condo units which encourages using less electricity to pay less per month. Low flow water fixtures will reduce water consumption. Developing Ililani in Kakaako will result in less driving for Ililani residents than if they lived in central Oahu and commuted into Honolulu for work. Locating Ililani next to the HART Civic Center station will further reduce the need to drive, reducing CO2 production and highway congestion.

Determination

After examining the potential impacts, the intended application of mitigation measures during and after construction, and the analysis of the project in terms of the significance criteria, the proposed project is not anticipated to have significant impacts. Consequently, the HHFDC, as the approving agency for this project, is anticipated to issue a Finding of No Significant Impact (FONSI).

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7. CONSULTATION

7.1 Pre-Assessment Consultation

The following agencies and organizations were consulted during the Draft EA Pre-Assessment Consultation process that took place in 2017. Parties that formally replied during the pre-assessment period, are indicated by a✓, below. All comments are reproduced in Appendix B.

Federal Agencies

National Oceanic and Atmospheric Administration, Pacific Islands Regional Office
U.S. Army Corps of Engineers
U.S. Department of the Interior, Fish and Wildlife Service
Federal Aviation Administration
Department of Homeland Security

State Legislative Branch

Senator Brickwood Galuteria
Representative Kyle Yamashita

State Agencies

Department of Accounting and General Services
Department of Business, Economic Development and Tourism
Department of Business, Economic Development and Tourism, Energy Office
Department of Business, Economic Development and Tourism, Land Use Commission
Department of Business, Economic Development and Tourism, Office of Planning
Department of Defense
✓ Department of Education
Department of Defense, State Civil Defense
Department of Health
Department of Health, Clean Water Branch
Department of Health, Environmental Management Division
✓ Department of Health, Environmental Planning Office
✓ Department of Land and Natural Resources
Department of Land and Natural Resources, Historic Preservation Division
Department of Transportation
Hawai‘i Community Development Authority
Office of Environmental Quality Control
Office of Hawaiian Affairs
Office of Planning
Hawai‘i Community Development Authority
✓ University of Hawai‘i at Mānoa Environmental Center

City Council

Councilmember Ann Kobayashi
Councilmember Carol Fukunaga

City and County of Honolulu Agencies

- ✓ Board of Water Supply
- Department of Community Services
- ✓ Department of Design and 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

Utility Companies

Verizon Hawai‘i
Hawai‘i Gas
Hawaiian Electric Company, Inc.
Hawaiian Telcom
Spectrum

Other Interested Parties and Individuals

Ala Moana – Kaka‘ako Neighborhood Board No. 11

7.2 Draft EA

Three comment letters were received during the public and agency comment period for the Draft EA, which began with the publication of the Draft EA in the OEQC’s Environmental Notice on February 8. 2018 and ended 30 days later on March 12, 2018. These letters are reproduced in Appendix B (Part II).

The following agencies and organizations commented on the Draft EA:

State Agencies

Department of Health
Hawai‘i Community Development Authority

City and County of Honolulu Agencies

Board of Water Supply

8. CHAPTER 201H APPLICATION: REQUESTED EXEMPTIONS AND DEFERRALS

Hawai‘i Revised Statutes (HRS) Section 201H-38, “Housing development; exemption from statutes, ordinances, charter provision, and rules” allows for eligible 201H projects to seek exemptions from all statutes, ordinances, and rules of any governmental agency relating to planning, zoning, and construction standards that do not negatively affect the health and safety of the general public in consideration of providing affordable housing.

The project is located in the Pauahi Neighborhood Zone within the Kaka‘ako Community Development District of Central Honolulu, on privately owned land. This property is also located within the Kaka‘ako Transit-oriented Development (TOD) plan. It is conveniently located in proximity to facilities and services that support the urban lifestyle needs of its occupants. The project is proposing to be financed, in part, from state funds made available from the Dwelling Unit Revolving Fund administered by Hawai‘i Housing Finance and Development Corporation. With contributions of financial assistance from this public agency, the project will be able to provide much needed affordable housing, and in turn will help to address critical affordable housing needs identified by the State. There is significant projected demand for new housing units on O‘ahu to be built between 2015 and 2025 to meet current and future housing needs, with some of the greatest demand by lower income groups (Hawai‘i Housing Planning Study, 2016 p.32-34). The exemption and deferral requests which follow are necessary to maximize the public contributions made available to produce much needed affordable housing.

The following is a description of the exemptions and deferrals being requested for Ililani, as an eligible 201H affordable for sale housing project. A summary of these exemptions and deferrals, presented in tabular form, follows as Table 8-1.

REQUESTED EXEMPTIONS AND DEFERRALS

<u>Exemptions From Kaka‘ako Community Development District Mauka Area Rules – Applicable agency is HCDA</u>

<u>Reserved Housing,</u>

• An exemption is sought from Kaka‘ako Reserved Housing Rules (Chapter 15-218)/HCDA. 20% Reserved Housing.

The project cannot feasibly comply with both the HCDA 20% Reserved Housing Rule and the HHFDC 50%+1 affordable housing rule.

Instead, the project proposes to comply with HHFDC 201H rules. The project will comply with all applicable HHFDC requirements and restrictions. Approximately 165 affordable housing units would be provided under Chapter 201H compared with 66 affordable units pursuant to HCDA 20% Reserved Housing. HHFDC 201H rules are feasible for the project while HCDA 20% Reserved Housing related rules are not feasible for the project.

Street Front Element Height,
• An exemption is sought from Mauka Area Rules Figure 1.3(D);; Figure NZ.6(D) (65' Street Front Element Height limit)/HCDA.

The project parking structure height along Halekauwila Street does not comply with HCDA 65' street element height limit.

The project proposes parking structure height along Halekauwila Street at about 79'. We need around 79' of parking street frontage to provide approximately 1 parking space per housing unit. This exemption is required to provide sufficient off- street parking for our project without building more parking spaces than are needed.

Maximum Allowable Density (FAR)
• An exemption is sought from Mauka Area Rules Figure 1.3(D); Figure NZ.6(D) (Maximum Density (FAR) is 3.5)/HCDA.

The project exceeds 3.5 FAR and does not comply with HCDA FAR rules.

Instead, the project proposes 8.8. FAR. This exemption and proposed project FAR is required for the economic feasibility of the project.

Public Facilities Dedication Fee
• An exemption is sought from Mauka Area Rules 15-217-65 (land dedication or fee payment)/HCDA. The public facilities dedication fee is estimated to be $320,000.

No land dedication or fee payment is proposed. This exemption is required for economic feasibility of the project.

Curb Cuts
• An exemption is sought from Mauka Area Rules 15-217-63(c) (Curb cut to be minimum 22' from adjacent property)/HCDA.

The project does not comply with HCDA curb cut rules.

Instead, proposed Halekauwila curb cuts (2) will be less than 22 feet from adjacent properties, compliant with City and County standards for location, design and ADA accessibility. Adequate site distance will be provided for vehicles exiting the driveway. The proposed driveways will not pose a safety risk. This proposed exemption is required for truck and car turning radii in and out of our parking structure, and efficiency of the parking structure.

LEED
• An exemption is sought from Mauka Area Rules 15-217-59 (HCDA staff anticipates LEED new construction v. 4 compliance)/HCDA.

The project is not LEED compliant as required by HCDA rules.

The project will incorporate LEED standards where feasible. This exemption is required for economic feasibility of the project.

Projections beyond build-to line,
• An exemption is sought from Mauka Area Rules Figure 1.13-C;(21' min. vertical clearance and 8' max. horizontal clearance)/HCDA.

The project is not compliant with the HCDA 21' min. vertical clearance for projections beyond the build-to line.

The project proposes 2nd floor balconies will project about 5' beyond the build-to line 15' above Lobby level. The balconies are necessary for locating air conditioning condenser units for the 2nd floor residential units and will improve quality of life for the residents compared to not having balconies.

Off-Street Parking
• An exemption is sought from Mauka Area Rules 15-217-63(e); 15-217-63(f); Figure 1.10-A, Off-Street Parking.

The project does not comply with HCDA Off-Street Parking requirements of 398 parking stalls.

Proposed are 395 parking stalls (of which 38 are tandem rear stalls) for 328 apartment units and 5,559 s.f. of commercial space. (Sufficient shared parking will be provided if using the HCDA 0.83 Mixed Use shared parking ratio). In addition, the project will be one block from a proposed HART station. This exemption is needed for financial feasibility of the project, to avoid building more than one parking space per unit, which is not needed for the project.

Frontage Occupancy at Build-to Line
• An exemption is sought from Mauka Area Rules; Figure 1.3(C); Figure NZ.6(C) (60% minimum frontage occupancy at build-to line).

The project does not comply with the 60% minimum frontage occupancy at build-to line HCDA requirement.

Proposed Halekauwila frontage occupancy will be approximately 49%. This exemption is needed to provide adequate parking ingress and egress.

Parking Placement Zone
• An exemption is sought from Mauka Area Rules Figure 1.10 (Parking setback is 40 feet from the parcel line). This exemption will allow the Project to provide one parking stall, designated only for generator fuel delivery, at the property line (0 feet within the 40-foot parking setback.

Recreation Space

• An exemption is sought from Mauka Area Rules 15-217-56(d) (55 square feet of recreation space per dwelling unit required for residential projects)

Due to budget, building envelope constraints and the small land size, Ililani will be able to provide 16,748 (18,040 required) square feet of recreation space. This exemption is required for economic feasibility of the project.

Mauka-Makai Zone

• An exemption is sought from Mauka Area Rules 15-217-55(l)(4) (Project tower to be located a minimum 300' from adjacent tower's mauka-makai zone)

Ililani's tower is approximately 187-feet from an existing adjacent tower, but it will not be within 300 feet of that tower's Mauka-Makai Zone. This exemption covers alternate axis interpretation of the nearest tower being 187' away. This exemption is required for economic feasibility of the project.

Exemption From Revised Ordinances of Honolulu – Various applicable City and County agencies (as noted)

• An exemption from Revised Ordinances of Honolulu, Sections 18-6.1 and 18-6.2 is sought for plan review fees and building permit fees estimated respectively to be approximately $450,000 and $250,000, in order to facilitate the economic feasibility of Ililani as a 201H affordable housing project. (Applicable Agency is DPP)

• A deferral from Revised Ordinances of Honolulu, Sections 14- 10.1, 14-10.2, and 14-10.3, is sought for payment of wastewater system facility charges, estimated to be approximately $2,197,174, until Certificate of Occupancy of the project, in order to facilitate the economic feasibility of Ililani as a 201H affordable housing project. (Applicable Agency is DPP)

• A deferral from Revised Ordinances of Honolulu, Section 1-102 is sought for payment of water system facilities charges, estimated to be approximately $604,889, until Certificate of Occupancy of the project, in order to facilitate the economic feasibility of Ililani as a 201H affordable housing project. (Applicable Agency is Board of Water Supply)

Table 8-1: "Summary of Requested Exemptions and Deferrals" which follows on the next several pages summarizes these requested exemptions and deferrals.

ADDITIONAL REPORTS/STUDIES

Pursuant to the development of the proposed project, several additional studies were commissioned by the applicant. These additional studies include the following and are on file at the HHFDC:

- Geotechnical Survey Report – Geolabs, January 2018.
- Phase I Environmental Site Assessment – Masa Fujioka & Associates, October 2016.
- Acoustical Criteria Report – D.L. Adams Associates, March 2017.

- Environmental Hazard Evaluation and Environmental Hazard Management Plan – Masa Fujioka & Associates, July 10, 2018.

Table 8-1: 201H Exemptions & Deferrals

Development Standard or Requirement	Relevant Rule(s)/Applicable Agency	Proposed Project Standard	Requested Exemption/Rationale	Est. Fee
	HCDA			
1. Reserved Housing	Kakaako Reserved Housing Rules (Chapter 15-218)/HCDA. 20% Reserved Housing	Exemption. The project will instead comply with all applicable HHFDC requirements and restrictions pertaining to sale of affordable housing units.	Request exemption from reserved housing rules. HHFDC's 201H rule provides more affordable housing than the HCDA 20% Reserved Housing. HHFDC 201H rules are feasible for our project while additional compliance with HCDA 20% Reserved Housing related rules would render the project infeasible.	NA
2. Maximum Height - Parking Structure	Mauka Area Rules Figure 1.3(D); Figure NZ.6(D) (65' Street Front Element Height limit)/HCDA	76' at Street Front, 78.5' at roof deck 45' set back from street front.	Request exemption from 65' height limit (Parking structure height will be about 79'). We need around 79' of parking street frontage height along Halekauwila Street to provide around 1 parking space per housing unit. This exemption is required to provide sufficient off- street parking.	NA
3. Density - FAR	Mauka Area Rules Figure 1.3(D); Figure NZ.6(D) (Maximum Density (FAR) is 3.5)/HCDA	8.8. FAR,	Request exemption from 3.5 maximum FAR (Building FAR to be about 8.8). This exemption and proposed project FAR is required for economic feasibility of the project.	NA
4. Public Facilities Dedication Fee	Mauka Area Rules 15-217-65 (land dedication or fee payment)/HCDA	No land dedication or fee payment.	Exemption from land dedication and fee payment. This exemption is required for economic feasibility of the project.	$ 320,000
5. Curb Cuts	Mauka Area Rules 15-217-63(c) (Curb cut to be minimum 22' from adjacent property)/HCDA	Halekauwila curb cuts (2) will be less than 22' feet from adjacent properties, compliant with City and County standards for location, design and ADA accessibility.	Request exemption from 22' minimum curb cut setback requirement (Halekauwila curb cuts (2) will be less than 22' from adjacent properties). The proposed driveway aprons will meet City and County standards for location, design and ADA accessibility. Adequate site distance will be provided for vehicles exiting the driveway. The proposed driveways will not pose a safety risk. This proposed exemption is required for truck and car turning radii in and out of our parking structure, and efficiency of the parking structure.	NA
6. LEED	Mauka Area Rules 15-217-59 (HCDA staff anticipates LEED new construction v. 4 compliance)/HCDA	Substantial but incomplete LEED compliance.	Request exemption from compliance with LEED (However, Project will incorporate LEED standards where feasible). This exemption is required for economic feasibility of the project.	NA

Table 8-1: 201H Exemptions & Deferrals (continued)				
Development Standard or Requirement	**Relevant Rule(s)/Applicable Agency**	**Proposed Project Standard**	**Requested Exemption/Rationale**	**Est. Fee**
	HCDA			
7. Projections beyond build-to line	Mauka Area Rules Figure 1.13-C; (21' min. vertical clearance and 8' max. horizontal clearance)/HCDA	2nd floor balconies will project about 5' beyond the build-to line 15' above Lobby level.	Request exemption from projections beyond build-to line limitations (2nd floor balconies will project about 5' beyond the build-to line), 15' above Lobby level. The balconies are necessary for locating air conditioning condenser units for the 2nd floor residential units and will improve quality of life for the residents compared to not having balconies.	NA
8. Off-Street Parking	Mauka Area Rules 15-217-63(e); 15-217-63(f); Figure 1.10-A (398 parking stalls required)/HCDA	395 parking stalls will be provided, of which 38 are tandem rear stalls.	Request exemption from the off-street parking requirements (Sufficient shared parking will be provided using the .83 shared parking ratio). In addition, the project will be 1 block from a proposed HART station. This exemption is needed for financial feasibility of the project, to avoid building more than 1 parking space per unit that are not needed for the project.	NA
9. Frontage Occupancy at Build-to Line	Mauka Area Rules Figure 1.3(C); Figure NZ.6(C) (60% minimum frontage occupancy at build-to line)/HCDA	49% average occupied frontage.	Request exemption from 60% minimum frontage occupancy at build-to line on Halekauwila St. (Halekauwila frontage occupancy will be about 49%). This exemption is needed to provide adequate parking ingress and egress.	NA
10. Parking Setback 40 Feet from Parcel Line	Mauka Area Rules Figure 1.10; Parking setback is 40 feet from the parcel line/HCDA	We require an open to sky monthly or quarterly emergency power refueling truck location at the parcel line (0-foot setback).	Request exemption from parking setback 40 feet from parcel line on Halekauwila St. This exemption is needed to provide open to sky emergency power refueling truck location. This provision meets City & County of Honolulu codes and is safe. One parking stall, designated only for generator fuel delivery, will be located at the Halekauwila property line (0 ft setback) as shown to and agreed to by HCDA.	NA
11. Recreation Space	Mauka Area Rules 15-217-56(d) (Residential projects…shall provide fifty-five square feet of recreation space per dwelling unit.)/HCDA	18,040 square feet of recreation space is required. Our design provides 16,748 square feet due to budget, building envelope constraints, and our small land size.	Request exemption from the recreation space requirement. Instead we will provide 16,748 square feet of recreation space. This exemption is required to maintain project feasibility.	NA

Table 8-1: 201H Exemptions & Deferrals (continued)				
Development Standard or Requirement	**Relevant Rule(s)/Applicable Agency**	**Proposed Project Standard**	**Requested Exemption/Rationale**	**Est. Fee**
	HCDA			
12. Mauka-Makai Zone	Mauka Area Rules 15-217-55(l)(4) (Minimum 300' from existing tower)/HCDA	Ililani's tower may be less than 300' from an existing adjacent tower's "mauka-makai zone" if an alternate axis interpretation is used	Request exemption from the 300' minimum tower separation. Ililani's tower is approximately 187' from an existing adjacent tower, but will not be within 300' of that tower's Mauka-Makai Zone. This exemption covers alternate axis interpretation of the nearest tower being 187' away, while HCDA has to date accepted the South Street axis tower separation as being compliant with the Mauka Rules. This exemption is required for economic feasibility of the project.	NA
	CITY & COUNTY OF HONOLULU			
13. Building Permit Fees	ROH 18-6.2/DPP	Exemption.	Request exemption from building permit fee. This exemption is required to maintain project feasibility.	$ 445,000
14. Plan Review Fees	ROH 18-6.1/DPP	Exemption.	Request exemption from plan review fees. This exemption is required to maintain project feasibility.	$ 25,000
15. Wastewater System Facility Charge	ROH 14-10.1; 14-10.2; and 14-10.3/DPP	Deferral.	Request deferral of wastewater system facility charge until certificate of occupancy. This deferral is required is to maintain project feasibility.	$2,197,174
16. Water System Facilities Charges	ROH Chapter 30/BWS	Deferral.	Request deferral of water system facilities charges until certificate of occupancy. This deferral is required to maintain project feasibility.	$ 604,899

9. REFERENCES

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APPENDIX A:

Traffic Impact Report

Traffic Impact Report

Ililani Development

Prepared for:
Ililani, LLC.

Prepared by:
Wilson Okamoto Corporation

April 2017
Updated January 2018

TRAFFIC IMPACT REPORT

FOR

ILILANI DEVELOPMENT

Prepared for:

Ililani, LLC
1860 Ala Moana Boulevard, #1000
Honolulu, Hawaii 96822

Prepared by:

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1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826
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April 2017
Updated January 2018

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I. INTRODUCTION

A. Purpose of Study

The purpose of this study is to identify and assess the traffic impacts resulting from the development of the proposed Ililani Residential Tower in Kakaako on the island of Oahu. The project entails the construction of a new multi-use development which will include multi-family residential units, commercial uses, and amenities. This study is an update to the previous "Traffic Impact Report for Ililani Development" prepared in April 2017 to incorporate changes to the project development plan.

B. Scope of Study

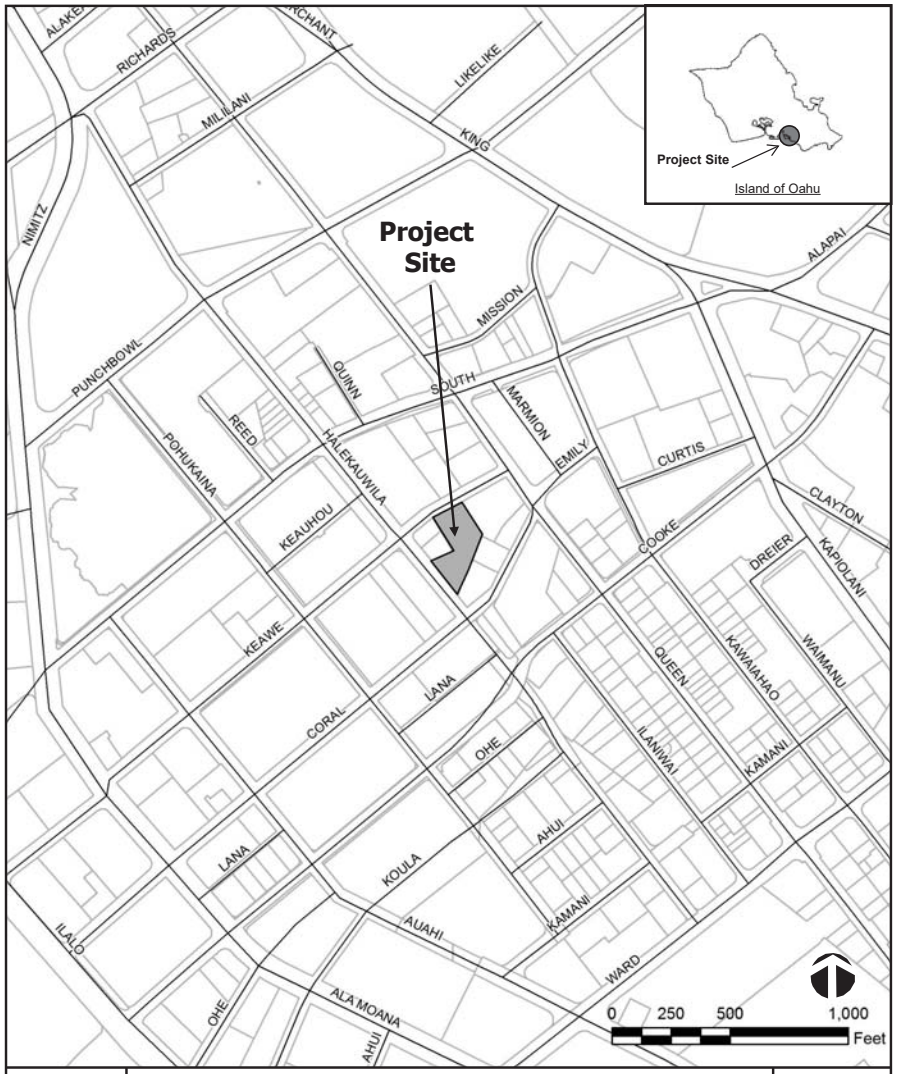
This report presents the findings and conclusions of the traffic study, the scope of which includes:

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

II. PROJECT DESCRIPTION

A. Location

The project site for the proposed Ililani Development is a 0.77-acre, L-shaped property located adjacent to Halekauwila Street in Kakaako on the island of Oahu (see Figure 1). The site is bounded by Queen Street to the north, Halekauwila Street to the south, Keawe Street to the west, and commercial uses to the east. The project site is further identified as Tax Map Keys (TMKs): 2-1-051: 011 and 012. Primary access to the project site will be provided via two driveways off Halekauwila Street.



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LOCATION MAP AND VICINITY MAP

FIGURE 1

B. Project Characteristics

The project site for the proposed Ililani development currently houses an existing commercial building. The existing building is expected to be replaced by a new development that is expected to include the following:

- Multi-family residential units (approximately 328 units)
- Approximately 6,059 square feet of commercial space
- Amenities such as recreational facilities and on-site parking

The proposed development is expected to be completed and occupied by the Year 2020 with primary access provided via two driveways off Halekauwila Street. The west driveway is expected to provide access to ground-level parking and the project site's loading/unloading areas while the east driveway is expected to provide access to a speed ramp that leads to additional parking in the upper levels. It should be noted that the City and County is currently developing a fixed guideway transit system that is planned to run along Halekauwila Street and as such, the both project driveways are expected to be restricted to right-turn-in right-turn-out movements only. Figure 2 shows the proposed project site plan.

III. EXISTING TRAFFIC CONDITIONS

A. Area Roadway System

Halekauwila Street is a predominantly two lane, two-way roadway generally oriented in the east-west direction. Southwest of the project site, Halekauwila Street intersects Keawe Street. At this unsignalized intersection, both approaches of Halekauwila Street have one stop-controlled lane that serves all traffic movements. Keawe Street is a predominantly two-lane, two-way roadway oriented generally in the north-south direction between Queen Street and Ilalo Street. At the intersection with Halekauwila Street, both approaches of Keawe Street also have a stop-controlled lane that serves all traffic movements.

North of the intersection with Halekauwila Street, Keawe Street intersects Queen Street. At this unsignalized intersection, both approaches of Queen Street have a shared left-turn and through lane with a shared right-turn and through lane. Queen Street is a predominantly four-lane, two-way roadway which transitions to a two-lane, two-way roadway east of the intersection with Cooke Street. At the

ILILANI DEVELOPMENT

PROPOSED SITE PLAN

FIGURE 2

intersection with Queen Street, the northbound approach of Keawe Street has one stop-controlled lane that serves all traffic movements. The southbound approach of this intersection is comprised of a driveway for the adjacent Keola Lai development which has one lane that also serves all traffic movements.

East of the intersection with Keawe Street, Queen Street intersects Cooke Street. At this signalized intersection, both approaches of Queen Street have one lane that serves the left-turn and through movements and one lane that serves right-turn and through movements. Cooke Street originates at Ilalo Street as a two-lane, two-way roadway, transitions to a four-lane roadway between Ala Moana Boulevard and Kapiolani Boulevard, then returns to a two-lane roadway until its terminus on South King Street. At the intersection with Queen Street, both approaches of Cooke Street have a shared left-turn and through lane and a shared right-turn and through lane. It should be noted that there are posted signs prohibiting right-turn movements on red at all approaches of this intersection.

South of the intersection with Queen Street, Cooke Street intersects Halekauwila Street. At this all-way stop intersection, both approaches of Cooke Street have a shared left-turn and through lane and a shared right-turn and through lane, while both approaches of Halekauwila Street have one stop-controlled lane that serves all traffic movements.

West of the intersection with Cooke Street, Halekauwila intersects Coral Street. At this unsignalized T-intersection, the westbound approach of Halekauwila Street has one lane that serves right-turn and through movements, while the eastbound approach has one lane that serves left-turn and through movements. Coral Street is a predominantly two-lane, two-way roadway generally oriented in the north-south direction. The northern segment of Coral Street extends between Queen Street and Halekauwila Street while the southern segment extends between Pohukaina Street and Ala Moana Boulevard. At the intersection with Halekauwila Street, the southbound approach of Coral Street has a stop-controlled lane that serves right-turn and left-turn movements.

B. Traffic Volumes and Conditions

1. General

a. Field Investigation

A field investigation was conducted on February 2017 and consisted of manual turning movement count surveys during the morning peak hours between 6:00 AM and 9:00 AM, and the afternoon peak hours between 3:00 PM and 6:00 PM at the following intersections:

- Halekauwila Street and Keawe Street
- Queen Street and Keawe Street
- Queen Street and Cooke Street
- Halekauwila Street and Cooke Street
- Halekauwila Street and Coral Street

Appendix A includes the existing traffic count data

b. Capacity Analysis Methodology

The highway capacity analysis performed in this study is based upon procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2000, and the "Synchro" software, developed by Trafficware. The analysis is based on the concept of Level of Service (LOS) to identify the traffic impacts associated with traffic demands during the peak periods of traffic.

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

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

2. Existing Peak Hour Traffic

a. General

Figures 3 and 4 show the existing lane use and peak hour traffic volumes. The AM peak hour of traffic generally occurs between 6:45 AM and 7:45 AM while the PM peak hour of traffic generally occurs between 4:45 PM and 5:45 PM. The analysis is based on these peak hour time periods for each intersection to identify the traffic impacts resulting from the proposed project. LOS calculations are included in Appendix C.

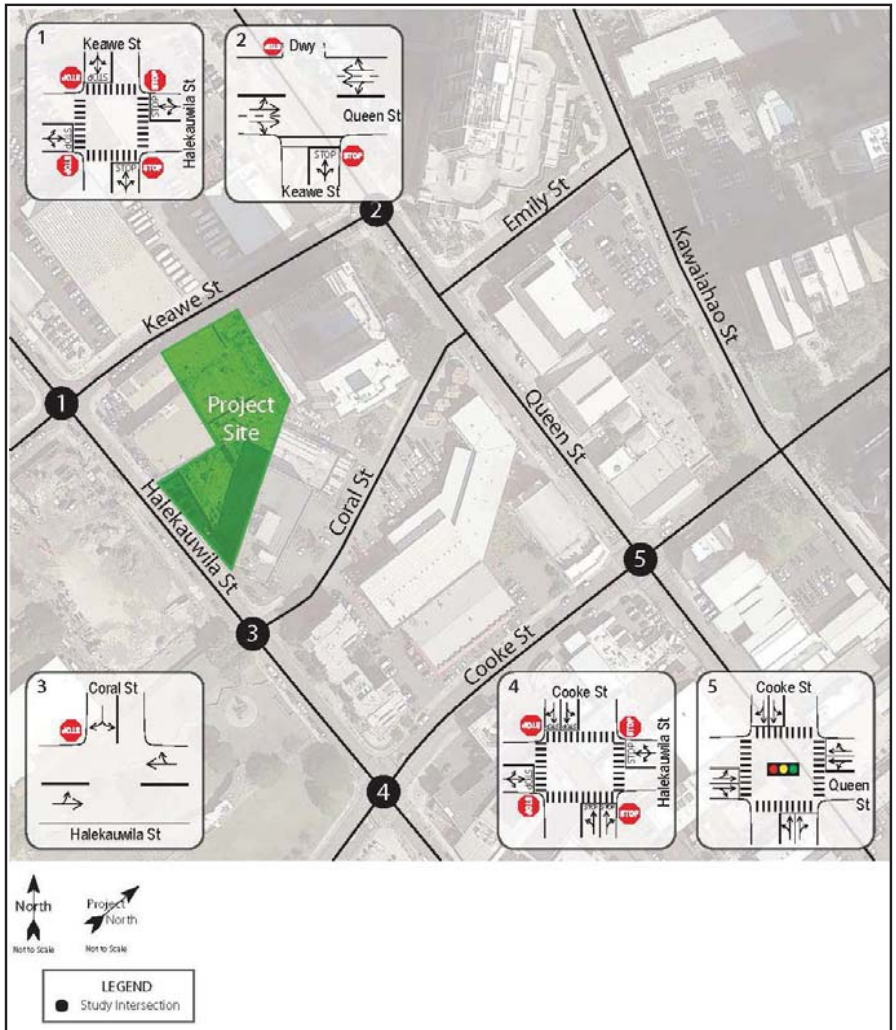
b. Halekauwila Street and Keawe Street

At the intersection with Keawe Street, Halekauwila Street carries 153 vehicles westbound and 122 vehicles eastbound during the AM peak period. During the PM peak period, the traffic volumes are higher with 178 vehicles and 435 vehicles traveling westbound and eastbound, respectively. Both approaches of Halekauwila Street operate at LOS "A" during the AM peak period. During the PM peak period, the westbound approach operates at LOS "B" while the eastbound approach operates at LOS "C" during the same peak period.

Along Keawe Street, the northbound approach of the intersection carries 67 vehicles, while the southbound approach carries 108 vehicles during the AM peak period. During the PM peak period, traffic volumes are higher with 82 vehicles traveling northbound and 184 vehicles traveling southbound. The northbound approach of Keawe Street operates at LOS "A" during both peak periods, while the southbound approach operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively.

c. Queen Street and Keawe Street

At the intersection with Keawe Street, Queen Street carries 672 vehicles westbound and 302 vehicles eastbound during the AM peak



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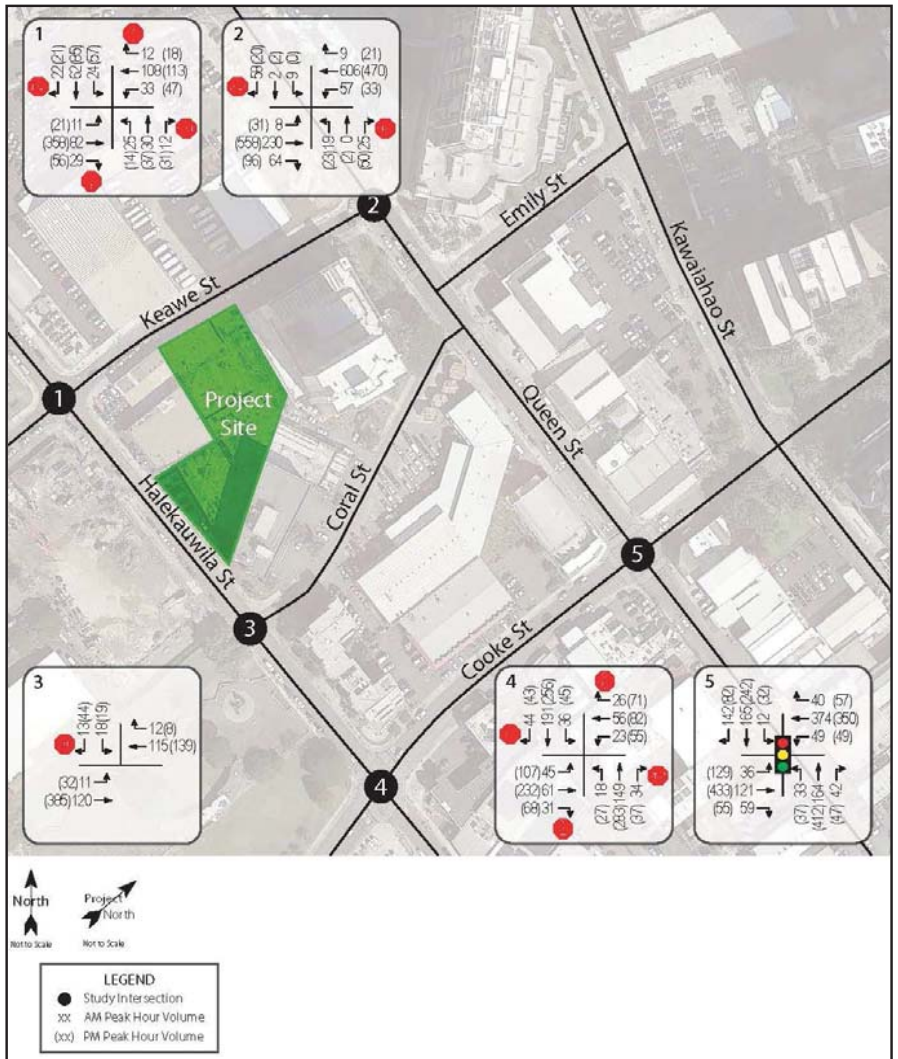
EXISTING LANE CONFIGURATIONS

FIGURE 3



WILSON OKAMOTO CORPORATION	ILILANI DEVELOPMENT	FIGURE
	EXISTING PEAK HOURS OF TRAFFIC	4

period. During the PM peak period, the overall traffic volume is higher with 524 vehicles traveling westbound and 685 vehicles traveling eastbound. Both approaches of Queen Street operate at LOS "A" during both peak periods.

The northbound approach of Keawe Street carries 44 vehicles during the AM peak period and 75 vehicles during the PM peak period. This approach operates at LOS "B" during the AM peak period and LOS "C" during the PM peak period. The southbound approach carries 69 vehicles during the AM peak period and 22 vehicles during the PM peak period. This approach operates at LOS "B" during both peak periods.

d. Queen Street and Cooke Street

At the intersection with Cooke Street, Queen Street carries 463 vehicles westbound and 216 vehicles eastbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 456 vehicles traveling westbound and 617 vehicles traveling eastbound. Both approaches of Queen Street operate at LOS "A" during the AM peak period, while the westbound and eastbound approaches operate at LOS "A" and LOS "B" during the PM peak period, respectively.

The northbound approach of Cooke Street carries 239 vehicles during the AM peak period and 496 vehicles during the PM peak period, while the southbound approach carries 319 vehicles during the AM peak period and 356 vehicles during the PM peak period. Both approaches operate at LOS "A" and LOS "B" during the AM and PM peak periods, respectively.

e. Halekauwila Street and Cooke Street

At the intersection with Cooke Street, Halekauwila Street carries 105 vehicles and 208 vehicles westbound during the AM and PM peak periods, respectively, while the eastbound approach carries 137 vehicles and 407 vehicles during the AM and PM peak periods,

respectively. Both approaches operate at LOS "A" during the AM peak period, while the westbound and eastbound approaches operates at LOS "C" and LOS "D" during the PM peak period, respectively.

Along Cooke Street, the northbound approach of the intersection carries 201 vehicles, while the southbound approach carries 271 vehicles during the AM peak period. During the PM peak period, the traffic volumes are higher with 347 vehicles traveling northbound and 344 vehicles traveling southbound. Both approaches operate at LOS "A" and LOS "B" during the AM and PM peak periods, respectively.

f. Halekauwila Street and Coral Street

At the intersection with Coral Street, Halekauwila Street carries 127 vehicles westbound and 131 vehicles eastbound during the AM peak period. During the PM peak period, the traffic volumes are higher with 147 vehicles traveling westbound and 417 vehicles traveling eastbound. Both approaches of Halekauwila Street operate at LOS "A" during both peak periods.

The southbound approach of Coral Street carries 31 vehicles during the AM peak period and 63 vehicles during the PM peak period. This approach operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively.

IV. PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

1. Trip Generation Methodology

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 9th Edition," 2012. The ITE trip generation rates are developed empirically by correlating vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per dwelling unit or 1,000 square feet of development. It should also be noted that all site-generated trips were conservatively

assumed to be new trips in the project vicinity. Table 1 summarizes the trip generation characteristics related to the proposed Ililani development applied to the AM and PM peak hours of traffic.

Table 1: Peak Hour Trip Generation

RESIDENTIAL (CONDOMINIUM/TOWNHOUSE) INDEPENDENT VARIABLE: Dwelling Units = 328		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	25
	EXIT	119
	TOTAL	144
PM PEAK	ENTER	114
	EXIT	57
	TOTAL	171
COMMERCIAL/RETAIL (SPECIALTY RETAIL CENTER) INDEPENDENT VARIABLE: 1,000 sf of development = 6.1		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	-
	EXIT	-
	TOTAL	-
PM PEAK	ENTER	7
	EXIT	10
	TOTAL	17
TOTALS		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	25
	EXIT	119
	TOTAL	144
PM PEAK	ENTER	121
	EXIT	67
	TOTAL	188

The trip generation methodology developed by ITE also includes provisions for internal capture of trips and multi-modal trips. Internal capture of trips account for vehicles that visit more than one destination within the same area without adding external vehicular trips to the surrounding roadways. Multi-modal trips are trips made utilizing non-motorized modes of travel such as walking and biking, as well as trips made using mass transit. The project site is currently served by established and convenient transit routes along Queen Street and South Street with improved pedestrian facilities

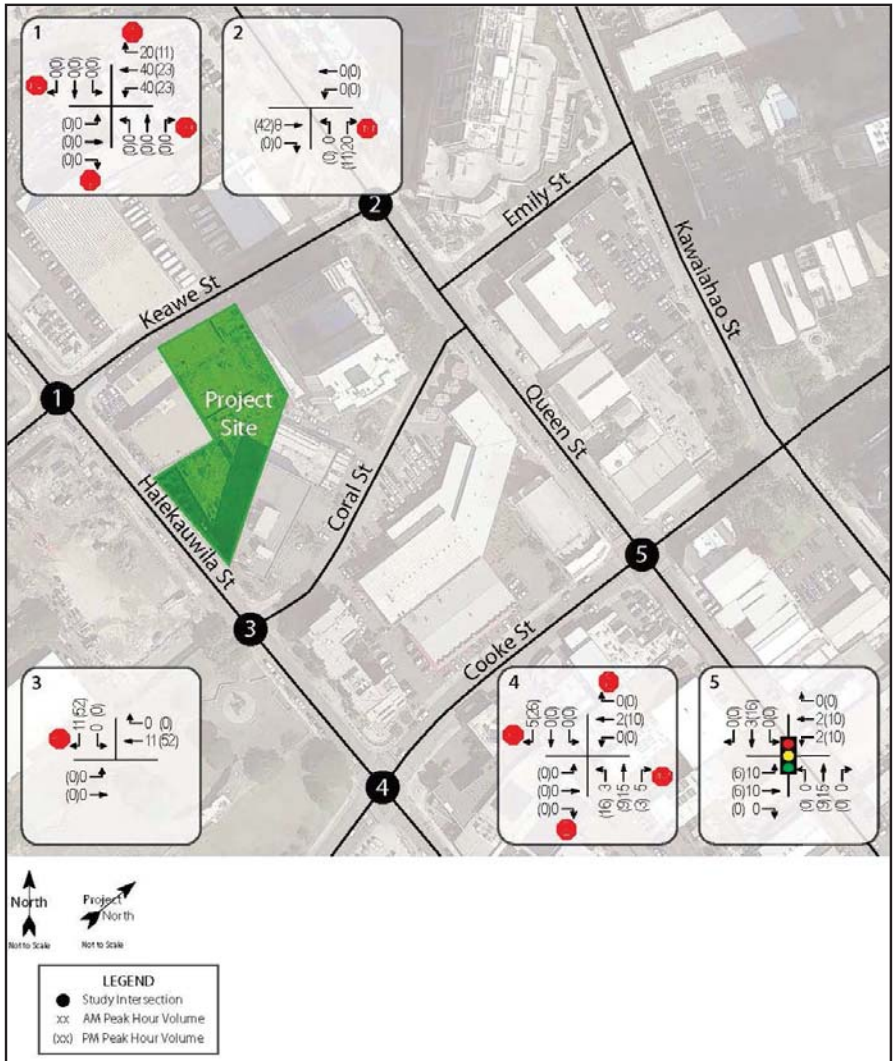
such as sidewalks and crosswalks along the roadways adjacent to the project. There are also plans currently underway for the addition of bicycle and transit networks in the project vicinity which will provide additional regional connections. As such, the trips generated by the new development were adjusted to account for the influence of internal capture of trips and multimodal trips (see Table 2).

Table 2: Adjusted Peak Hour Trip Generation

ADJUSTED TOTALS		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	21
	EXIT	101
	TOTAL	122
PM PEAK	ENTER	104
	EXIT	57
	TOTAL	161

2. Trip Distribution

Figure 5 shows the distribution of site-generated traffic during the AM and PM peak periods. Primary access to the proposed Ililani Development will be provided via driveways off Halekauwila Street. As previously discussed, turning movements in this driveway are expected to be restricted to right-turn movements to accommodate the planned rail alignment along Halekauwila Street. The directional distribution of all site-generated vehicles was based upon the relative distribution of traffic between the study intersections. As such, 10% and 30% of trips were assumed to travel to/from the west via Halekauwila Street and Queen Street, respectively, while 10% and 20% of trips were assumed to travel to/from the east via the same respective roadways. Northbound and southbound trips were assumed to utilize Cooke Street, with 15% of trips traveling to/from the north and 15% of trips traveling to/from the south. The distribution of all site-generated vehicles at the study intersections was based on their assumed origin/destination, allowed turning movements, and the relative convenience of available routes.



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ILILANI DEVELOPMENT

DISTRIBUTION OF SITE-GENERATED VEHICLES WITH PROJECT

FIGURE 5

B. Through Traffic Forecasting Methodology

The travel forecast is based upon historical traffic count data obtained from the State DOT, Highways Division at survey stations located in the vicinity of the project site. The historical data indicates a stable or declining growth in traffic and as such, an annual traffic growth rate of approximately 0.5% was conservatively assumed in the project vicinity. Using 2017 as the Base Year, a growth rate factor of 1.015 was applied to the existing traffic demands in the project vicinity to achieve the projected Year 2020 traffic demands.

C. Other Considerations

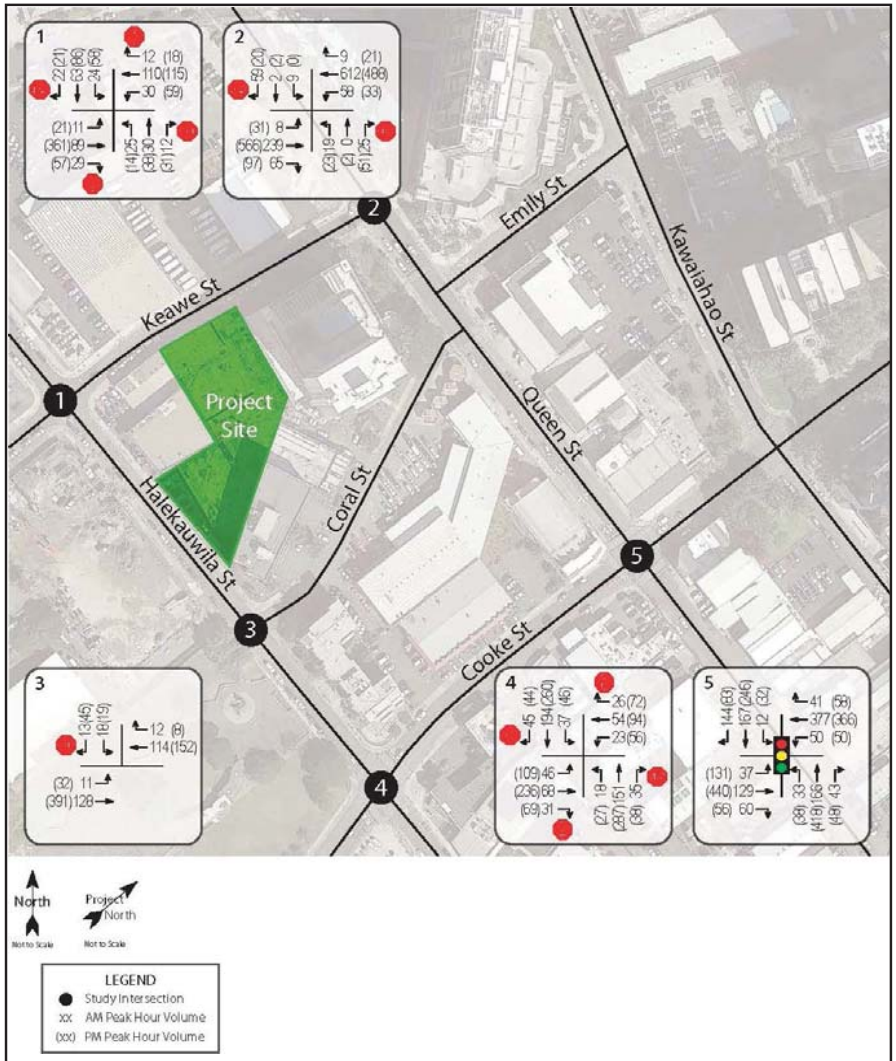
The proposed Ililani Development will be located in the vicinity of another planned multi-use development. Keauhou Lane is currently under construction and is expected to include residential units and space for commercial/retail use. Primary access for this development will be provided via driveways off Pohukaina Street and South Street. Based on the information included in the "Traffic Impact Report for Keauhou Lane" dated October 2013, the trips associated with this future development were incorporated into the Year 2020 without project conditions to account for the traffic expected to be generated by this development.

D. Total Traffic Volumes Without Project

The projected Year 2020 AM and PM peak period traffic volumes and operating conditions without the proposed Ililani Development are shown in Figure 6 and summarized in Table 3. The existing levels of service are provided for comparison purposes. LOS calculations are included in Appendix D.

Table 3: Existing and Projected Year 2020 (Without Project) LOS Traffic Operating Conditions

Intersection	Approach/ Critical Movement	AM		PM	
		Exist	Year 2020 w/out Proj	Exist	Year 2020 w/out Proj
Halekauwila St/ Keawe St	Eastbound	A	A	C	C
	Westbound	A	A	B	B
	Northbound	A	A	A	A
	Southbound	A	A	B	B



WILSON OKAMOTO CORPORATION

ILILANI DEVELOPMENT

YEAR 2020 PEAK HOURS OF TRAFFIC WITHOUT PROJECT

FIGURE 6

Table 3: Existing and Projected Year 2020 (Without Project) LOS Traffic Operating Conditions (Cont'd)

Intersection	Approach/ Critical Movement	AM		PM	
		Exist	Year 2020 w/out Proj	Exist	Year 2020 w/out Proj
Queen St/ Keawe St	Eastbound	A	A	A	A
	Westbound	A	A	A	A
	Northbound	B	B	C	C
	Southbound	B	B	B	B
Queen St/ Cooke St	Eastbound	A	A	B	B
	Westbound	A	A	A	A
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Halekauwila St/ Cooke St	Eastbound	A	B	D	E
	Westbound	A	A	C	C
	Northbound	A	A	B	C
	Southbound	A	A	B	C
Halekauwila St/ Coral St	Eastbound (LT)*	A	A	A	A
	Southbound	A	A	B	B

* LT = Left-turn

Under Year 2020 without project conditions, traffic operations at the intersection of Halekauwila Street and Cooke Street are expected to decline slightly due to the anticipated growth in ambient traffic along these roadways. The northbound and southbound approaches of the Halekauwila Street and Cooke Street intersection are expected to operate at a slightly lower, but acceptable, LOS "C" during the PM peak period, while traffic operations are anticipated to deteriorate from an LOS "D" to an LOS "E" along the southbound approach during the same peak period. The remaining study intersections along Halekauwila Street and Queen Street are anticipated to remain at levels of service similar to existing conditions.

E. Total Traffic Volumes With Project

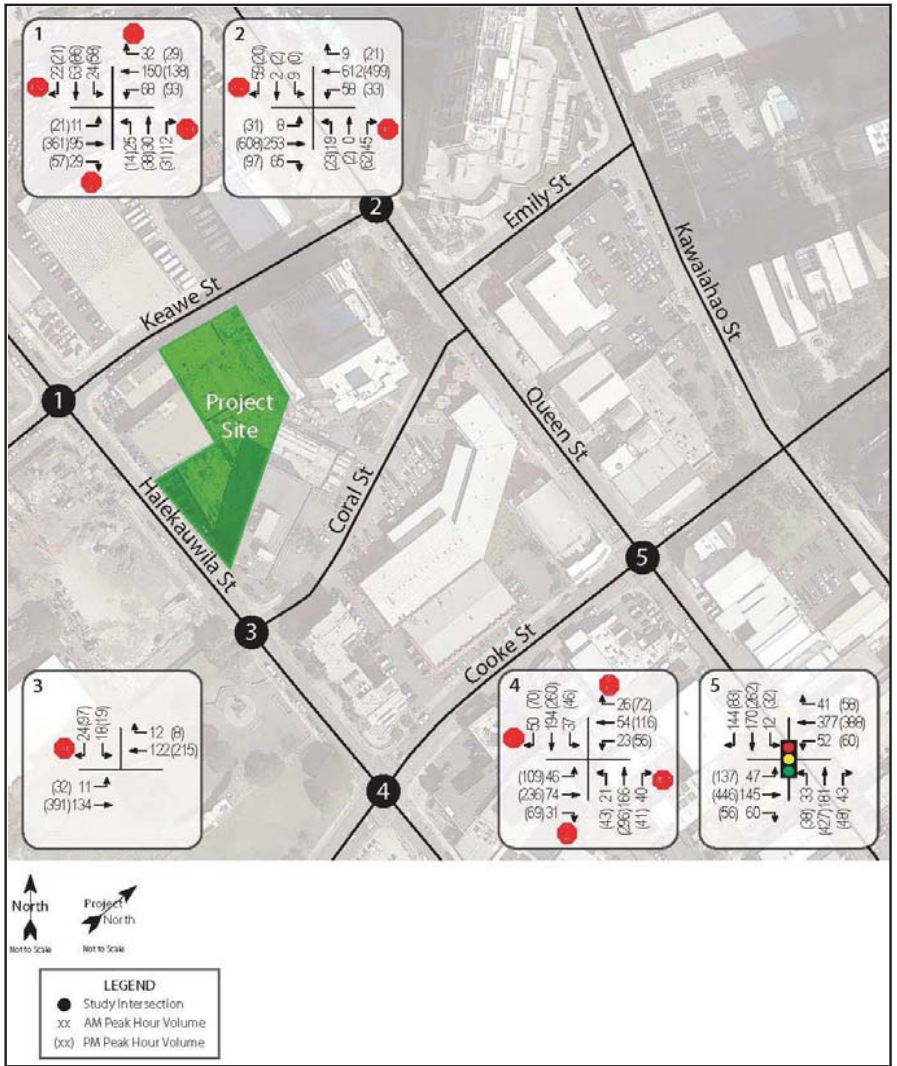
Figure 7 shows the Year 2020 cumulative AM and PM peak hour traffic conditions resulting from the projected external traffic and the proposed Ililani development. The cumulative volumes consist of site-generated traffic superimposed over Year 2020 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.

V. TRAFFIC IMPACT ANALYSIS

The Year 2020 cumulative AM and PM peak hour traffic conditions with the Ililani development are summarized in Table 4. The existing and projected Year 2020 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix E.

Table 4: Existing and Projected Year 2020 (Without and With Project) LOS Traffic Operating Conditions

Intersection	Approach/ Critical Movement	AM			PM		
		Exist	Year 2020		Exist	Year 2020	
			w/out Proj	w/ Proj		w/out Proj	w/ Proj
Halekauwila St/ Keawe St	Eastbound	A	A	A	C	C	C
	Westbound	A	A	B	B	B	B
	Northbound	A	A	A	A	A	B
	Southbound	A	A	A	B	B	B
Queen St/ Keawe St	Eastbound	A	A	A	A	A	A
	Westbound	A	A	A	A	A	A
	Northbound	B	B	B	C	C	C
	Southbound	B	B	B	B	B	B
Queen St/ Cooke St	Eastbound	A	A	A	B	B	B
	Westbound	A	A	A	A	A	A
	Northbound	A	A	A	B	B	B
	Southbound	A	A	A	B	B	B
Halekauwila St/ Cooke St	Eastbound	A	B	B	D	E	E
	Westbound	A	A	A	C	C	C
	Northbound	A	A	A	B	C	C
	Southbound	A	A	A	B	C	C



WILSON OKAMOTO CORPORATION	ILILANI DEVELOPMENT YEAR 2020 PEAK HOURS OF TRAFFIC WITH PROJECT	FIGURE 7

Table 4: Existing and Projected Year 2020 (Without and With Project) LOS Traffic Operating Conditions (Cont'd)

Intersection	Approach/ Critical Movement	AM			PM		
		Exist	Year 2020		Exist	Year 2020	
			w/out Proj	w/ Proj		w/out Proj	w/ Proj
Halekauwila St/ Coral St	Eastbound	A	A	A	A	A	A
	Southbound	A	A	A	B	B	B

Under Year 2020 with project conditions, traffic operations in the vicinity are generally expected to remain similar to without project conditions despite the anticipated increases in traffic along the surrounding roadways. Along Queen Street, traffic operations at the intersection with Cooke Street are expected to remain at LOS "B" or better during both peak periods while those at the intersection with Keawe Street are expected to continue operating at LOS "C" or better during both peak periods. Similarly, the approaches of the study intersections along Halekauwila Street are also generally anticipated to operate at levels of service similar to without project conditions.

VI. RECOMMENDATIONS

Based on the analysis of the traffic data, the following are the recommendations of this study to be incorporated in the project design.

1. Maintain sufficient sight distance for motorists to safely enter and exit the project driveways. In particular, ensure that the proposed speed ramp near the east edge of the project site has sufficient sight distance to vehicles traveling along the adjacent roadway and vehicles accessing the parking area for the adjacent property.

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

3. Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto public roadways.

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

5. If access to the entrance of the parking garage is controlled, provide sufficient storage for entering vehicles at the parking garage access control (i.e. automatic gate, etc.) to ensure that queues do not extend on the adjacent public roadway.

6. Restrict turning movements at the project driveways off Halekauwila Street to right-turn-in and right-turn-out movements only. Provide adequate channelization to direct vehicular movements exiting the driveway. The specific configuration shall be determined during the design phase.

7. Provide adequate on-site facilities to accommodate alternate modes of transportation including improved pedestrian facilities and secured bicycle racks/storage.

VII. CONCLUSION

The project site for the proposed Ililani development entails the replacement of existing commercial uses with a new tower that will include multi-family residential units, retail space, and recreational amenities. Although all site-generated trips were conservatively assumed to be new trips in the project vicinity, traffic operations are generally expected to remain similar to without project conditions upon the projected completion of Ililani Development. As such, with the implementation of the aforementioned recommendations, the proposed Ililani development is not expected to have a significant impact on traffic operations in the project vicinity.

APPENDIX A

EXISTING TRAFFIC COUNT DATA

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counted By: AH
Counter: D4-5677
Weather: Clear

File Name : HaleKea AM
Site Code : 00000005
Start Date : 2/28/2017
Page No : 1

Groups Printed- Unshifted

	Keawe Street Southbound					Halekauwila Street Westbound					Keawe Street Northbound					Halekauwila Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	3	11	0	2	16	1	3	2	2	8	2	1	1	1	5	1	15	7	12	35	64
06:15 AM	4	9	10	4	27	6	12	1	5	24	3	5	3	1	12	1	14	2	7	24	87
06:30 AM	2	8	6	0	16	6	14	1	6	27	4	3	5	2	14	3	23	11	13	50	107
06:45 AM	6	21	5	9	41	6	16	4	11	37	10	5	1	8	24	1	15	10	15	41	143
Total	15	49	21	15	100	19	45	8	24	96	19	14	10	12	55	6	67	30	47	150	401
07:00 AM	7	8	6	2	23	7	33	3	4	47	6	9	4	4	23	2	19	4	6	31	124
07:15 AM	5	17	7	2	31	10	26	2	1	39	3	7	1	4	15	6	17	7	13	43	128
07:30 AM	6	16	4	1	27	10	33	3	8	54	6	9	6	7	28	2	31	8	5	46	155
07:45 AM	4	5	9	1	19	9	27	5	3	44	2	8	2	6	18	1	14	8	3	26	107
Total	22	46	26	6	100	36	119	13	16	184	17	33	13	21	84	11	81	27	27	146	514
08:00 AM	3	9	3	1	16	5	21	1	4	31	4	6	7	7	24	0	23	7	2	32	103
08:15 AM	3	11	3	1	18	6	31	5	4	46	4	6	4	7	21	3	24	16	7	50	135
08:30 AM	8	12	5	2	27	5	28	4	1	38	6	6	3	2	17	0	19	3	6	28	110
08:45 AM	5	14	1	0	20	5	22	4	3	34	1	3	3	5	12	0	20	7	3	30	96
Total	19	46	12	4	81	21	102	14	12	149	15	21	17	21	74	3	86	33	18	140	444
Grand Total	56	141	59	25	281	76	266	35	52	429	51	68	40	54	213	20	234	90	92	436	1359
Apprch %	19.9	50.2	21	8.9		17.7	62	8.2	12.1		23.9	31.9	18.8	25.4		4.6	53.7	20.6	21.1		
Total %	4.1	10.4	4.3	1.8	20.7	5.6	19.6	2.6	3.8	31.6	3.8	5	2.9	4	15.7	1.5	17.2	6.6	6.8	32.1	

	Keawe Street Southbound				Halekauwila Street Westbound				Keawe Street Northbound				Halekauwila Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 06:45 AM																	
06:45 AM	6	**21**	5	**32**	6	16	**4**	26	**10**	5	1	16	1	15	**10**	26	100
07:00 AM	**7**	8	6	21	7	**33**	3	43	6	**9**	4	19	2	19	4	25	108
07:15 AM	5	17	**7**	29	**10**	26	2	38	3	7	1	11	**6**	17	7	30	108
07:30 AM	6	16	4	26	10	33	3	**46**	6	9	**6**	**21**	2	**31**	8	**41**	**134**
Total Volume	24	62	22	108	33	108	12	153	25	30	12	67	11	82	29	122	450
% App. Total	22.2	57.4	20.4		21.6	70.6	7.8		37.3	44.8	17.9		9	67.2	23.8		
PHF	.857	.738	.786	.844	.825	.818	.750	.832	.625	.833	.500	.798	.458	.661	.725	.744	.840

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counted By: AH
Counter: D4-5677
Weather: Clear

File Name : HaleKea PM
Site Code : 00000005
Start Date : 2/28/2017
Page No : 1

Groups Printed- Unshifted

	Keawe Street Southbound					Halekauwila Street Westbound					Keawe Street Northbound					Halekauwila Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	7	16	4	1	28	7	11	7	1	26	9	8	13	0	30	0	32	13	7	52	136
03:15 PM	6	16	4	6	32	5	22	6	6	39	1	4	8	4	17	3	38	12	21	74	162
03:30 PM	10	11	1	2	24	9	22	3	2	36	5	11	6	0	22	3	45	21	28	97	179
03:45 PM	15	15	6	2	38	5	30	5	4	44	1	3	8	3	15	1	64	13	4	82	179
Total	38	58	15	11	122	26	85	21	13	145	16	26	35	7	84	7	179	59	60	305	656
04:00 PM	3	30	2	1	36	9	31	4	5	49	4	9	5	4	22	1	39	15	4	59	166
04:15 PM	6	11	4	5	26	7	25	6	3	41	3	8	3	2	16	2	55	9	10	76	159
04:30 PM	13	21	9	2	45	10	20	6	6	42	4	8	15	4	31	2	69	12	7	90	208
04:45 PM	10	24	6	1	41	7	24	4	8	43	2	10	5	3	20	3	87	12	2	104	208
Total	32	86	21	9	148	33	100	20	22	175	13	35	28	13	89	8	250	48	23	329	741
05:00 PM	12	27	5	2	46	9	32	4	4	49	4	10	12	2	28	7	84	14	9	114	237
05:15 PM	16	17	8	4	45	19	29	5	1	54	4	10	6	2	22	7	92	10	7	116	237
05:30 PM	19	17	2	4	42	12	28	5	2	47	4	7	8	5	24	4	95	20	4	123	236
05:45 PM	15	17	4	1	37	6	27	5	3	41	2	14	6	15	37	1	47	5	5	58	173
Total	62	78	19	11	170	46	116	19	10	191	14	41	32	24	111	19	318	49	25	411	883
Grand Total	132	222	55	31	440	105	301	60	45	511	43	102	95	44	284	34	747	156	108	1045	2280
Apprch %	30	50.5	12.5	7		20.5	58.9	11.7	8.8		15.1	35.9	33.5	15.5		3.3	71.5	14.9	10.3		
Total %	5.8	9.7	2.4	1.4	19.3	4.6	13.2	2.6	2	22.4	1.9	4.5	4.2	1.9	12.5	1.5	32.8	6.8	4.7	45.8	

	Keawe Street Southbound				Halekauwila Street Westbound				Keawe Street Northbound				Halekauwila Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	10	24	6	40	7	24	4	35	2	**10**	5	17	3	87	12	102	194
05:00 PM	12	**27**	5	**44**	9	**32**	4	45	**4**	10	**12**	**26**	**7**	84	14	105	220
05:15 PM	16	17	**8**	41	**19**	29	**5**	**53**	4	10	6	20	7	92	10	109	**223**
05:30 PM	**19**	17	2	38	12	28	5	45	4	7	8	19	4	**95**	**20**	**119**	221
Total Volume	57	85	21	163	47	113	18	178	14	37	31	82	21	358	56	435	858
% App. Total	35	52.1	12.9		26.4	63.5	10.1		17.1	45.1	37.8		4.8	82.3	12.9		
PHF	.750	.787	.656	.926	.618	.883	.900	.840	.875	.925	.646	.788	.750	.942	.700	.914	.962

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counted By: GH
Counter: D4-5673
Weather: Clear

File Name : QueKea AM
Site Code : 00000001
Start Date : 2/28/2017
Page No : 1

Groups Printed- Unshifted

	Keola Lai Driveway Southbound					Queen Street Westbound					Keawe Street Northbound					Queen Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	2	0	9	0	11	8	44	0	0	52	3	0	3	3	9	0	36	10	0	46	118
06:15 AM	2	1	3	0	6	13	53	1	0	67	2	0	3	1	6	2	43	11	0	56	135
06:30 AM	2	0	8	0	10	8	57	1	0	66	5	0	1	1	7	0	42	5	1	48	131
06:45 AM	1	0	11	0	12	18	121	2	0	141	1	0	10	8	19	1	53	14	0	68	240
Total	7	1	31	0	39	47	275	4	0	326	11	0	17	13	41	3	174	40	1	218	624
07:00 AM	2	0	18	0	20	8	145	2	0	155	7	0	4	9	20	3	59	13	0	75	270
07:15 AM	5	1	18	0	24	11	167	3	0	181	7	0	7	5	19	3	58	21	0	82	306
07:30 AM	1	1	11	0	13	20	173	2	0	195	4	0	4	7	15	1	60	16	0	77	300
07:45 AM	1	1	13	0	15	14	133	3	0	150	4	0	7	2	13	3	92	10	0	105	283
Total	9	3	60	0	72	53	618	10	0	681	22	0	22	23	67	10	269	60	0	339	1159
08:00 AM	4	0	5	0	9	10	164	4	0	178	6	0	8	7	21	0	66	9	0	75	283
08:15 AM	0	0	8	0	8	12	156	1	0	169	9	0	8	3	20	3	69	11	0	83	280
08:30 AM	6	1	7	0	14	9	120	1	0	130	7	0	6	5	18	3	70	18	0	91	253
08:45 AM	2	0	5	0	7	11	120	0	0	131	5	0	3	6	14	2	79	10	0	91	243
Total	12	1	25	0	38	42	560	6	0	608	27	0	25	21	73	8	284	48	0	340	1059
Grand Total	28	5	116	0	149	142	1453	20	0	1615	60	0	64	57	181	21	727	148	1	897	2842
Apprch %	18.8	3.4	77.9	0		8.8	90	1.2	0		33.1	0	35.4	31.5		2.3	81	16.5	0.1		
Total %	1	0.2	4.1	0	5.2	5	51.1	0.7	0	56.8	2.1	0	2.3	2	6.4	0.7	25.6	5.2	0	31.6	

	Keola Lai Driveway Southbound				Queen Street Westbound				Keawe Street Northbound				Queen Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**5**	**1**	**18**	**24**	11	167	3	181	**7**	0	7	**14**	**3**	58	**21**	82	**301**
07:30 AM	1	1	11	13	**20**	**173**	2	**195**	4	0	4	8	1	60	16	77	293
07:45 AM	1	1	13	15	14	133	3	150	4	0	7	11	3	**92**	10	**105**	281
08:00 AM	4	0	5	9	10	164	**4**	178	6	0	**8**	14	0	66	9	75	276
Total Volume	11	3	47	61	55	637	12	704	21	0	26	47	7	276	56	339	1151
% App. Total	18	4.9	77		7.8	90.5	1.7		44.7	0	55.3		2.1	81.4	16.5		
PHF	.550	.750	.653	.635	.688	.921	.750	.903	.750	.000	.813	.839	.583	.750	.667	.807	.956

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counted By: GH
Counter: D4-5673
Weather: Clear

File Name : QueKea PM
Site Code : 00000001
Start Date : 2/28/2017
Page No : 1

Groups Printed- Unshifted

	Keola Lai Driveway Southbound					Queen Street Westbound					Keawe Street Northbound					Queen Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	3	2	5	0	10	10	146	8	0	164	6	0	6	2	14	3	97	12	0	112	300
03:15 PM	2	0	6	0	8	6	153	6	0	165	9	1	5	1	16	4	135	22	0	161	350
03:30 PM	0	0	0	0	0	5	157	1	0	163	10	0	7	1	18	2	157	16	0	175	356
03:45 PM	1	0	2	0	3	11	153	5	0	169	4	1	4	5	14	6	157	19	0	182	368
Total	6	2	13	0	21	32	609	20	0	661	29	2	22	9	62	15	546	69	0	630	1374
04:00 PM	0	0	1	0	1	15	143	3	0	161	6	0	10	1	17	5	141	19	0	165	344
04:15 PM	0	0	3	0	3	8	125	6	0	139	5	0	11	6	22	10	127	14	0	151	315
04:30 PM	1	0	4	0	5	12	129	3	0	144	12	0	9	9	30	8	143	16	0	167	346
04:45 PM	0	0	5	0	5	12	127	7	0	146	6	1	13	7	27	8	152	18	0	178	356
Total	1	0	13	0	14	47	524	19	0	590	29	1	43	23	96	31	563	67	0	661	1361
05:00 PM	0	1	6	0	7	8	132	1	0	141	5	0	9	1	15	4	119	25	0	148	311
05:15 PM	0	1	6	0	7	7	103	6	0	116	6	0	19	11	36	12	131	31	0	174	333
05:30 PM	0	0	3	0	3	6	108	7	0	121	6	1	9	2	18	7	156	22	0	185	327
05:45 PM	2	0	4	0	6	10	116	8	0	134	5	0	14	5	24	12	139	26	0	177	341
Total	2	2	19	0	23	31	459	22	0	512	22	1	51	19	93	35	545	104	0	684	1312
Grand Total	9	4	45	0	58	110	1592	61	0	1763	80	4	116	51	251	81	1654	240	0	1975	4047
Apprch %	15.5	6.9	77.6	0		6.2	90.3	3.5	0		31.9	1.6	46.2	20.3		4.1	83.7	12.2	0		
Total %	0.2	0.1	1.1	0	1.4	2.7	39.3	1.5	0	43.6	2	0.1	2.9	1.3	6.2	2	40.9	5.9	0	48.8	

	Keola Lai Driveway Southbound				Queen Street Westbound				Keawe Street Northbound				Queen Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:15 PM																	
03:15 PM	**2**	0	**6**	**8**	6	153	**6**	165	9	**1**	5	15	4	135	**22**	161	349
03:30 PM	0	0	0	0	5	**157**	1	163	**10**	0	7	**17**	2	**157**	16	175	355
03:45 PM	1	0	2	3	11	153	5	**169**	4	1	4	9	**6**	157	19	**182**	**363**
04:00 PM	0	0	1	1	**15**	143	3	161	6	0	**10**	16	5	141	19	165	343
Total Volume	3	0	9	12	37	606	15	658	29	2	26	57	17	590	76	683	1410
% App. Total	25	0	75		5.6	92.1	2.3		50.9	3.5	45.6		2.5	86.4	11.1		
PHF	.375	.000	.375	.375	.617	.965	.625	.973	.725	.500	.650	.838	.708	.939	.864	.938	.971

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counted By: DY, FS
Counter: D4-5676, D4-3890
Weather: Clear

File Name : QueCoo AM
Site Code : 00000002
Start Date : 2/28/2017
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Queen Street Westbound					Cooke Street Northbound					Queen Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	17	6	3	26	3	28	5	15	51	3	16	4	2	25	3	21	8	4	36	138
06:15 AM	0	19	11	2	32	8	31	3	12	54	3	16	4	0	23	3	22	9	5	39	148
06:30 AM	3	31	12	1	47	9	35	7	18	69	6	25	2	2	35	4	22	14	7	47	198
06:45 AM	3	41	32	3	79	9	70	10	17	106	4	28	5	10	47	12	29	12	6	59	291
Total	6	108	61	9	184	29	164	25	62	280	16	85	15	14	130	22	94	43	22	181	775
07:00 AM	3	37	34	5	79	8	84	6	15	113	6	47	10	4	67	8	38	18	8	72	331
07:15 AM	4	48	39	8	99	16	104	11	16	147	10	52	14	2	78	9	25	15	7	56	380
07:30 AM	2	39	37	10	88	16	116	13	16	161	13	37	13	9	72	7	29	14	8	58	379
07:45 AM	5	52	38	1	96	25	98	17	20	160	8	57	12	10	87	11	62	17	6	96	439
Total	14	176	148	24	362	65	402	47	67	581	37	193	49	25	304	35	154	64	29	282	1529
08:00 AM	4	47	32	2	85	18	111	15	11	155	5	47	16	3	71	8	47	18	6	79	390
08:15 AM	2	57	26	8	93	14	108	22	10	154	11	52	11	3	77	10	40	15	11	76	400
08:30 AM	6	57	34	2	99	23	84	19	9	135	8	50	9	5	72	12	48	15	1	76	382
08:45 AM	4	55	33	2	94	5	78	11	11	105	10	49	15	7	81	8	56	12	11	87	367
Total	16	216	125	14	371	60	381	67	41	549	34	198	51	18	301	38	191	60	29	318	1539
Grand Total	36	500	334	47	917	154	947	139	170	1410	87	476	115	57	735	95	439	167	80	781	3843
Apprch %	3.9	54.5	36.4	5.1		10.9	67.2	9.9	12.1		11.8	64.8	15.6	7.8		12.2	56.2	21.4	10.2		
Total %	0.9	13	8.7	1.2	23.9	4	24.6	3.6	4.4	36.7	2.3	12.4	3	1.5	19.1	2.5	11.4	4.3	2.1	20.3	

	Cooke Street Southbound				Queen Street Westbound				Cooke Street Northbound				Queen Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	5	52	**38**	95	**25**	98	17	140	8	**57**	12	**77**	11	**62**	17	**90**	**402**
08:00 AM	4	47	32	83	18	**111**	15	**144**	5	47	**16**	68	8	47	**18**	73	368
08:15 AM	2	**57**	26	85	14	108	**22**	144	**11**	52	11	74	10	40	15	65	368
08:30 AM	**6**	57	34	**97**	23	84	19	126	8	50	9	67	**12**	48	15	75	365
Total Volume	17	213	130	360	80	401	73	554	32	206	48	286	41	197	65	303	1503
% App. Total	4.7	59.2	36.1		14.4	72.4	13.2		11.2	72	16.8		13.5	65	21.5		
PHF	.708	.934	.855	.928	.800	.903	.830	.962	.727	.904	.750	.929	.854	.794	.903	.842	.935

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counted By: DY, FS
Counter: D4-5676, D4-3890
Weather: Clear

File Name : QueCoo PM
Site Code : 00000002
Start Date : 2/28/2017
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Queen Street Westbound					Cooke Street Northbound					Queen Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	18	64	26	4	112	13	103	11	6	133	9	64	17	4	94	13	74	16	14	117	456
03:15 PM	17	65	45	2	129	20	98	17	4	139	6	61	20	3	90	22	76	11	8	117	475
03:30 PM	18	75	27	6	126	13	103	18	11	145	11	84	20	5	120	28	101	22	6	157	548
03:45 PM	9	65	30	6	110	19	114	12	5	150	14	77	12	4	107	22	111	22	7	162	529
Total	62	269	128	18	477	65	418	58	26	567	40	286	69	16	411	85	362	71	35	553	2008
04:00 PM	4	65	35	7	111	16	96	22	15	149	8	78	23	1	110	20	109	16	6	151	521
04:15 PM	5	62	16	5	88	15	103	15	9	142	14	75	20	2	111	19	110	13	3	145	486
04:30 PM	9	67	15	15	106	14	86	13	23	136	11	110	15	10	146	34	104	21	11	170	558
04:45 PM	10	68	18	5	101	9	98	19	22	148	7	95	9	8	119	34	120	16	15	185	553
Total	28	262	84	32	406	54	383	69	69	575	40	358	67	21	486	107	443	66	35	651	2118
05:00 PM	8	76	24	8	116	14	84	14	14	126	15	99	15	8	137	43	87	7	17	154	533
05:15 PM	7	57	21	5	90	18	78	16	10	122	10	115	11	8	144	34	106	17	17	174	530
05:30 PM	7	41	19	3	70	8	90	8	24	130	5	103	12	7	127	18	120	15	15	168	495
05:45 PM	5	30	14	6	55	8	94	13	7	122	9	82	21	4	116	30	123	15	4	172	465
Total	27	204	78	22	331	48	346	51	55	500	39	399	59	27	524	125	436	54	53	668	2023
Grand Total	117	735	290	72	1214	167	1147	178	150	1642	119	1043	195	64	1421	317	1241	191	123	1872	6149
Apprch %	9.6	60.5	23.9	5.9		10.2	69.9	10.8	9.1		8.4	73.4	13.7	4.5		16.9	66.3	10.2	6.6		
Total %	1.9	12	4.7	1.2	19.7	2.7	18.7	2.9	2.4	26.7	1.9	17	3.2	1	23.1	5.2	20.2	3.1	2	30.4	

	Cooke Street Southbound				Queen Street Westbound				Cooke Street Northbound				Queen Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	**18**	**75**	27	**120**	13	103	18	134	11	**84**	20	**115**	**28**	101	**22**	151	**520**
03:45 PM	9	65	30	104	**19**	**114**	12	**145**	**14**	77	12	103	22	**111**	22	**155**	507
04:00 PM	4	65	**35**	104	16	96	**22**	134	8	78	**23**	109	20	109	16	145	492
04:15 PM	5	62	16	83	15	103	15	133	14	75	20	109	19	110	13	142	467
Total Volume	36	267	108	411	63	416	67	546	47	314	75	436	89	431	73	593	1986
% App. Total	8.8	65	26.3		11.5	76.2	12.3		10.8	72	17.2		15	72.7	12.3		
PHF	.500	.890	.771	.856	.829	.912	.761	.941	.839	.935	.815	.948	.795	.971	.830	.956	.955

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counted By: BE
Counter: D4-3889
Weather: Clear

File Name : HaleCoo AM
Site Code : 00000003
Start Date : 2/28/2017
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Halekauwila Street Westbound					Cooke Street Northbound					Halekauwila Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	10	22	2	0	34	1	6	5	2	14	1	19	5	2	27	6	10	6	3	25	100
06:15 AM	9	21	8	2	40	7	6	2	2	17	3	12	9	1	25	6	12	6	3	27	109
06:30 AM	9	34	9	1	53	6	7	5	7	25	1	22	4	5	32	4	18	7	5	34	144
06:45 AM	12	40	12	3	67	6	11	4	6	27	1	30	10	4	45	9	10	6	8	33	172
Total	40	117	31	6	194	20	30	16	17	83	6	83	28	12	129	25	50	25	19	119	525
07:00 AM	8	37	14	2	61	4	19	4	3	30	4	39	10	3	56	15	9	9	2	35	182
07:15 AM	7	58	9	2	76	9	12	14	2	37	5	44	5	2	56	10	19	7	3	39	208
07:30 AM	9	56	9	7	81	4	14	4	2	24	8	36	9	3	56	11	23	9	2	45	206
07:45 AM	10	62	16	5	93	17	20	6	5	48	4	47	6	2	59	10	17	7	6	40	240
Total	34	213	48	16	311	34	65	28	12	139	21	166	30	10	227	46	68	32	13	159	836
08:00 AM	7	56	8	5	76	5	7	7	3	22	4	39	8	3	54	11	9	10	4	34	186
08:15 AM	8	50	12	3	73	4	13	3	1	21	10	46	8	2	66	8	10	9	2	29	189
08:30 AM	11	62	7	3	83	2	12	8	1	23	1	47	3	3	54	13	17	3	1	34	194
08:45 AM	14	45	14	2	75	7	6	5	2	20	7	51	5	2	65	11	7	20	3	41	201
Total	40	213	41	13	307	18	38	23	7	86	22	183	24	10	239	43	43	42	10	138	770
Grand Total	114	543	120	35	812	72	133	67	36	308	49	432	82	32	595	114	161	99	42	416	2131
Apprch %	14	66.9	14.8	4.3		23.4	43.2	21.8	11.7		8.2	72.6	13.8	5.4		27.4	38.7	23.8	10.1		
Total %	5.3	25.5	5.6	1.6	38.1	3.4	6.2	3.1	1.7	14.5	2.3	20.3	3.8	1.5	27.9	5.3	7.6	4.6	2	19.5	

	Cooke Street Southbound				Halekauwila Street Westbound				Cooke Street Northbound				Halekauwila Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	8	37	14	59	4	19	4	27	4	39	**10**	53	**15**	9	**9**	33	172
07:15 AM	7	58	9	74	9	12	**14**	35	5	44	5	54	10	19	7	36	199
07:30 AM	9	56	9	74	4	14	4	22	**8**	36	9	53	11	**23**	9	**43**	192
07:45 AM	**10**	**62**	**16**	**88**	**17**	**20**	6	**43**	4	**47**	6	**57**	10	17	7	34	**222**
Total Volume	34	213	48	295	34	65	28	127	21	166	30	217	46	68	32	146	785
% App. Total	11.5	72.2	16.3		26.8	51.2	22		9.7	76.5	13.8		31.5	46.6	21.9		
PHF	.850	.859	.750	.838	.500	.813	.500	.738	.656	.883	.750	.952	.767	.739	.889	.849	.884

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counted By: BE
Counter: D4-3889
Weather: Clear

File Name : HaleCoo PM
Site Code : 00000003
Start Date : 2/28/2017
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Halekauwila Street Westbound					Cooke Street Northbound					Halekauwila Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	8	63	11	3	85	4	11	9	2	26	7	63	4	2	76	8	21	21	9	59	246
03:15 PM	17	76	8	4	105	4	19	11	4	38	11	60	10	4	85	13	28	13	2	56	284
03:30 PM	20	93	6	3	122	11	17	17	9	54	4	75	7	5	91	18	32	11	3	64	331
03:45 PM	8	93	13	5	119	4	23	8	5	40	12	58	9	8	87	21	43	12	2	78	324
Total	53	325	38	15	431	23	70	45	20	158	34	256	30	19	339	60	124	57	16	257	1185
04:00 PM	8	82	15	2	107	7	22	13	5	47	6	71	11	4	92	13	29	8	3	53	299
04:15 PM	18	51	18	4	91	8	13	17	10	48	4	80	11	9	104	14	40	13	1	68	311
04:30 PM	12	74	10	11	107	13	14	11	3	41	5	78	11	2	96	28	47	16	5	96	340
04:45 PM	11	68	13	7	99	9	22	13	12	56	2	69	9	3	83	30	52	21	9	112	350
Total	49	275	56	24	404	37	71	54	30	192	17	298	42	18	375	85	168	58	18	329	1300
05:00 PM	11	74	6	5	96	18	21	15	7	61	3	74	9	5	91	20	61	17	4	102	350
05:15 PM	14	66	18	3	101	16	19	20	2	57	12	73	7	2	94	32	61	10	4	107	359
05:30 PM	9	48	6	7	70	12	20	23	14	69	10	67	12	2	91	25	58	20	5	108	338
05:45 PM	7	45	5	3	60	13	18	18	6	55	8	52	21	8	89	16	47	18	2	83	287
Total	41	233	35	18	327	59	78	76	29	242	33	266	49	17	365	93	227	65	15	400	1334
Grand Total	143	833	129	57	1162	119	219	175	79	592	84	820	121	54	1079	238	519	180	49	986	3819
Apprch %	12.3	71.7	11.1	4.9		20.1	37	29.6	13.3		7.8	76	11.2	5		24.1	52.6	18.3	5		
Total %	3.7	21.8	3.4	1.5	30.4	3.1	5.7	4.6	2.1	15.5	2.2	21.5	3.2	1.4	28.3	6.2	13.6	4.7	1.3	25.8	

	Cooke Street Southbound				Halekauwila Street Westbound				Cooke Street Northbound				Halekauwila Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	12	**74**	10	96	13	14	11	38	5	**78**	**11**	**94**	28	47	16	91	319
04:45 PM	11	68	13	92	9	**22**	13	44	2	69	9	80	30	52	**21**	**103**	319
05:00 PM	11	74	6	91	**18**	21	15	54	3	74	9	86	20	**61**	17	98	329
05:15 PM	**14**	66	**18**	**98**	16	19	**20**	**55**	**12**	73	7	92	**32**	61	10	103	**348**
Total Volume	48	282	47	377	56	76	59	191	22	294	36	352	110	221	64	395	1315
% App. Total	12.7	74.8	12.5		29.3	39.8	30.9		6.2	83.5	10.2		27.8	55.9	16.2		
PHF	.857	.953	.653	.962	.778	.864	.738	.868	.458	.942	.818	.936	.859	.906	.762	.959	.945

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counted By: EV
Counter: TU-0650
Weather: Clear

File Name : HaleCor AM
Site Code : 00000004
Start Date : 2/28/2017
Page No : 1

Groups Printed- Unshifted

	Coral Street Southbound					Halekauwila Street Westbound					Northbound	Halekauwila Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	5	0	1	3	9	0	6	3	0	9	0	3	19	0	2	24	42
06:15 AM	3	0	4	3	10	0	15	2	0	17	0	2	20	0	2	24	51
06:30 AM	1	0	3	1	5	0	15	2	0	17	0	1	28	0	3	32	54
06:45 AM	2	0	0	4	6	1	22	1	0	24	0	0	24	0	5	29	59
Total	11	0	8	11	30	1	58	8	0	67	0	6	91	0	12	109	206
07:00 AM	5	0	1	2	8	0	36	2	0	38	0	3	27	0	5	35	81
07:15 AM	6	0	5	1	12	0	26	6	0	32	0	1	31	0	7	39	83
07:30 AM	5	0	7	6	18	0	31	3	0	34	0	7	38	0	5	50	102
07:45 AM	6	0	2	5	13	0	35	3	0	38	0	3	25	0	7	35	86
Total	22	0	15	14	51	0	128	14	0	142	0	14	121	0	24	159	352
08:00 AM	5	0	6	4	15	0	18	2	0	20	0	6	31	0	1	38	73
08:15 AM	9	0	6	4	19	0	31	9	0	40	0	5	25	0	6	36	95
08:30 AM	6	0	8	3	17	0	23	2	0	25	0	7	33	0	8	48	90
08:45 AM	10	0	6	3	19	0	22	4	0	26	0	3	25	0	8	36	81
Total	30	0	26	14	70	0	94	17	0	111	0	21	114	0	23	158	339
Grand Total	63	0	49	39	151	1	280	39	0	320	0	41	326	0	59	426	897
Apprch %	41.7	0	32.5	25.8		0.3	87.5	12.2	0			9.6	76.5	0	13.8		
Total %	7	0	5.5	4.3	16.8	0.1	31.2	4.3	0	35.7	0	4.6	36.3	0	6.6	47.5	

	Coral Street Southbound				Halekauwila Street Westbound				Northbound	Halekauwila Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 07:30 AM														
07:30 AM	5	0	**7**	12	0	31	3	34	0	**7**	**38**	0	**45**	**91**
07:45 AM	6	0	2	8	0	**35**	3	38	0	3	25	0	28	74
08:00 AM	5	0	6	11	0	18	2	20	0	6	31	0	37	68
08:15 AM	**9**	0	6	**15**	0	31	**9**	**40**	0	5	25	0	30	85
Total Volume	25	0	21	46	0	115	17	132	0	21	119	0	140	318
% App. Total	54.3	0	45.7		0	87.1	12.9			15	85	0		
PHF	.694	.000	.750	.767	.000	.821	.472	.825	.000	.750	.783	.000	.778	.874

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counted By: EV
Counter: TU-0650
Weather: Clear

File Name : HaleCor PM
Site Code : 00000004
Start Date : 2/28/2017
Page No : 1

Groups Printed- Unshifted

	Coral Street Southbound					Halekauwila Street Westbound					Northbound	Halekauwila Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	11	0	10	2	23	0	23	5	0	28	0	5	42	0	11	58	109
03:15 PM	10	0	8	1	19	0	28	7	0	35	0	6	40	0	3	49	103
03:30 PM	10	0	4	0	14	0	23	3	0	26	0	3	51	0	7	61	101
03:45 PM	4	0	4	4	12	0	38	5	0	43	0	5	73	0	10	88	143
Total	35	0	26	7	68	0	112	20	0	132	0	19	206	0	31	256	456
04:00 PM	12	0	5	4	21	0	42	4	0	46	0	2	40	0	9	51	118
04:15 PM	10	0	8	2	20	0	29	5	0	34	0	6	61	0	5	72	126
04:30 PM	5	0	8	6	19	0	23	6	0	29	0	5	94	0	8	107	155
04:45 PM	6	0	7	3	16	0	35	1	1	37	0	5	91	0	7	103	156
Total	33	0	28	15	76	0	129	16	1	146	0	18	286	0	29	333	555
05:00 PM	5	0	14	3	22	0	31	1	0	32	0	10	97	0	14	121	175
05:15 PM	4	0	11	0	15	0	39	4	0	43	0	6	97	0	5	108	166
05:30 PM	4	0	12	4	20	0	34	2	0	36	0	11	100	0	5	116	172
05:45 PM	5	0	7	0	12	0	31	2	0	33	0	6	67	0	1	74	119
Total	18	0	44	7	69	0	135	9	0	144	0	33	361	0	25	419	632
Grand Total	86	0	98	29	213	0	376	45	1	422	0	70	853	0	85	1008	1643
Apprch %	40.4	0	46	13.6		0	89.1	10.7	0.2			6.9	84.6	0	8.4		
Total %	5.2	0	6	1.8	13	0	22.9	2.7	0.1	25.7	0	4.3	51.9	0	5.2	61.4	

	Coral Street Southbound				Halekauwila Street Westbound				Northbound	Halekauwila Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 04:45 PM														
04:45 PM	**6**	0	7	13	0	35	1	36	0	5	91	0	96	145
05:00 PM	5	0	**14**	**19**	0	31	1	32	0	10	97	0	107	158
05:15 PM	4	0	11	15	0	**39**	**4**	**43**	0	6	97	0	103	161
05:30 PM	4	0	12	16	0	34	2	36	0	**11**	**100**	0	**111**	**163**
Total Volume	19	0	44	63	0	139	8	147	0	32	385	0	417	627
% App. Total	30.2	0	69.8		0	94.6	5.4			7.7	92.3	0		
PHF	.792	.000	.786	.829	.000	.891	.500	.855	.000	.727	.963	.000	.939	.962

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Level of Service (LOS) for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically a 15-min analysis period. The criteria are given in the following table.

Table 1: Level-of-Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec/veh)
A	≤10.0
B	>10.0 and ≤20.0
C	>20.0 and ≤35.0
D	>35.0 and ≤55.0
E	>55.0 and ≤80.0
F	>80.0

Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group.

Level of Service A describes operations with low control delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.

Level of Service B describes operations with control delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.

Level of Service C describes operations with control delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

Level of Service D describes operations with control delay greater than 35 and up to 55 sec per vehicle. At level of service D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

"Highway Capacity Manual," Transportation Research Board, 2000.

Level of Service E describes operation with control delay greater than 55 and up to 80 sec per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.

Level of Service F describes operations with control delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Level of Service (LOS) criteria are given in Table 1. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. If the degree of saturation is greater than about 0.9, average control delay is significantly affected by the length of the analysis period.

Table 1: Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (Sec/Veh)
A	≤10.0
B	>10.0 and ≤15.0
C	>15.0 and ≤25.0
D	>25.0 and ≤35.0
E	>35.0 and ≤50.0
F	>50.0

APPENDIX C

CAPACITY ANALYSIS CALCULATIONS
EXISTING PEAK PERIOD TRAFFIC ANALYSIS

HCM Unsignalized Intersection Capacity Analysis
1: Keawe St & Halekauwila St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	82	29	33	108	12	25	30	12	24	62	22
Future Volume (vph)	11	82	29	33	108	12	25	30	12	24	62	22
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	13	98	35	39	129	14	30	36	14	29	74	26

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	146	182	80	129
Volume Left (vph)	13	39	30	29
Volume Right (vph)	35	14	14	26
Hadj (s)	-0.09	0.03	0.00	-0.04
Departure Headway (s)	4.6	4.6	4.9	4.7
Degree Utilization, x	0.18	0.23	0.11	0.17
Capacity (veh/h)	739	734	684	701
Control Delay (s)	8.6	9.0	8.4	8.7
Approach Delay (s)	8.6	9.0	8.4	8.7
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.7	
Level of Service			A	
Intersection Capacity Utilization			33.4%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1: Keawe St & Halekauwila St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	358	56	47	113	18	14	37	31	57	85	21
Future Volume (vph)	21	358	56	47	113	18	14	37	31	57	85	21
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	22	373	58	49	118	19	15	39	32	59	89	22

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	453	186	86	170
Volume Left (vph)	22	49	15	59
Volume Right (vph)	58	19	32	22
Hadj (s)	-0.03	0.03	-0.15	0.03
Departure Headway (s)	4.9	5.3	5.7	5.7
Degree Utilization, x	0.62	0.28	0.14	0.27
Capacity (veh/h)	707	627	538	564
Control Delay (s)	15.5	10.3	9.6	10.8
Approach Delay (s)	15.5	10.3	9.6	10.8
Approach LOS	C	B	A	B

Intersection Summary			
Delay		13.0	
Level of Service		B	
Intersection Capacity Utilization		49.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
2: Keawe St & Queen St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	230	64	57	606	9	19	0	25	9	2	58
Future Volume (Veh/h)	8	230	64	57	606	9	19	0	25	9	2	58
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	256	71	63	673	10	21	0	28	10	2	64
Pedestrians								29				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								3				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					610							
pX, platoon unblocked												
vC, conflicting volume	683			356			866	1148	192	978	1178	342
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	683			356			866	1148	192	978	1178	342
tC, single (s)	*3.1			*3.1			*6.5	6.5	*5.9	*6.5	*5.5	*5.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			92	100	97	96	99	91
cM capacity (veh/h)	1104			1293			262	181	839	246	244	722

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	137	199	400	346	49	76
Volume Left	9	0	63	0	21	10
Volume Right	0	71	0	10	28	64
cSH	1104	1700	1293	1700	432	553
Volume to Capacity	0.01	0.12	0.05	0.20	0.11	0.14
Queue Length 95th (ft)	1	0	4	0	10	12
Control Delay (s)	0.6	0.0	1.7	0.0	14.4	12.5
Lane LOS	A		A		B	B
Approach Delay (s)	0.2		0.9		14.4	12.5
Approach LOS					B	B

Intersection Summary			
Average Delay		2.0	
Intersection Capacity Utilization		46.9%	ICU Level of Service A
Analysis Period (min)		15	

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
2: Keawe St & Queen St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	558	96	33	470	21	23	2	50	0	2	20
Future Volume (Veh/h)	31	558	96	33	470	21	23	2	50	0	2	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	33	594	102	35	500	22	24	2	53	0	2	21
Pedestrians								21				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								2				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					610							
pX, platoon unblocked												
vC, conflicting volume	522			717			1074	1324	369	998	1364	261
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	522			717			1074	1324	369	998	1364	261
tC, single (s)	*3.1			*3.1			*6.5	*5.5	*5.9	7.5	*5.5	*5.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			89	99	92	100	99	97
cM capacity (veh/h)	1210			1061			212	209	685	171	200	795

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	330	399	285	272	79	23
Volume Left	33	0	35	0	24	0
Volume Right	0	102	0	22	53	21
cSH	1210	1700	1061	1700	394	632
Volume to Capacity	0.03	0.23	0.03	0.16	0.20	0.04
Queue Length 95th (ft)	2	0	3	0	18	3
Control Delay (s)	1.0	0.0	1.3	0.0	16.4	10.9
Lane LOS	A		A		C	B
Approach Delay (s)	0.5		0.7		16.4	10.9
Approach LOS					C	B

Intersection Summary				
Average Delay		1.6		
Intersection Capacity Utilization		55.4%	ICU Level of Service	B
Analysis Period (min)		15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
3: Halekauwila St & Coral St

4/20/2017

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	120	115	12	18	13
Future Volume (Veh/h)	11	120	115	12	18	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	14	150	144	15	23	16
Pedestrians		22			13	
Lane Width (ft)		12.0			12.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		2			1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	172				342	186
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	172				342	186
tC, single (s)	*3.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1457				705	872

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	164	159	39
Volume Left	14	0	23
Volume Right	0	15	16
cSH	1457	1700	765
Volume to Capacity	0.01	0.09	0.05
Queue Length 95th (ft)	1	0	4
Control Delay (s)	0.7	0.0	10.0
Lane LOS	A		A
Approach Delay (s)	0.7	0.0	10.0
Approach LOS			A

Intersection Summary				
Average Delay		1.4		
Intersection Capacity Utilization		30.6%	ICU Level of Service	A
Analysis Period (min)		15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
3: Halekauwila St & Coral St

4/20/2017

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	385	139	8	19	44
Future Volume (Veh/h)	32	385	139	8	19	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	33	401	145	8	20	46
Pedestrians		31	1		10	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		3	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	163				627	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	163				627	190
tC, single (s)	*3.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				96	95
cM capacity (veh/h)	1468				517	864

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	434	153	66
Volume Left	33	0	20
Volume Right	0	8	46
cSH	1468	1700	718
Volume to Capacity	0.02	0.09	0.09
Queue Length 95th (ft)	2	0	8
Control Delay (s)	0.8	0.0	10.5
Lane LOS	A		B
Approach Delay (s)	0.8	0.0	10.5
Approach LOS			B

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
4: Cooke St & Halekauwila St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	45	61	31	23	56	26	18	149	34	36	191	44
Future Volume (vph)	45	61	31	23	56	26	18	149	34	36	191	44
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	68	34	26	62	29	20	166	38	40	212	49

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	152	117	103	121	146	155
Volume Left (vph)	50	26	20	0	40	0
Volume Right (vph)	34	29	0	38	0	49
Hadj (s)	-0.03	-0.07	0.13	-0.19	0.17	-0.19
Departure Headway (s)	5.3	5.3	5.7	5.4	5.7	5.3
Degree Utilization, x	0.22	0.17	0.16	0.18	0.23	0.23
Capacity (veh/h)	622	612	593	626	600	641
Control Delay (s)	9.8	9.4	8.7	8.4	9.2	8.7
Approach Delay (s)	9.8	9.4	8.5		8.9	
Approach LOS	A	A	A		A	

Intersection Summary			
Delay	9.1		
Level of Service	A		
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Cooke St & Halekauwila St

4/21/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	107	232	68	55	82	71	27	283	37	45	256	43
Future Volume (vph)	107	232	68	55	82	71	27	283	37	45	256	43
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	114	247	72	59	87	76	29	301	39	48	272	46

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	433	222	180	190	184	182
Volume Left (vph)	114	59	29	0	48	0
Volume Right (vph)	72	76	0	39	0	46
Hadj (s)	-0.01	-0.12	0.11	-0.11	0.16	-0.14
Departure Headway (s)	6.7	7.2	7.8	7.6	7.9	7.5
Degree Utilization, x	0.81	0.45	0.39	0.40	0.40	0.38
Capacity (veh/h)	513	445	425	434	427	435
Control Delay (s)	32.1	15.9	14.5	14.3	14.9	13.9
Approach Delay (s)	32.1	15.9	14.4		14.4	
Approach LOS	D	C	B		B	

Intersection Summary				
Delay		20.1		
Level of Service		C		
Intersection Capacity Utilization		63.9%	ICU Level of Service	B
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
5: Cooke St & Queen St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	121	59	49	374	40	33	164	42	12	165	142
Future Volume (vph)	36	121	59	49	374	40	33	164	42	12	165	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.99			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.99			0.97			0.93	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		3345			3466			3398			3261	
Flt Permitted		0.83			0.89			0.86			0.94	
Satd. Flow (perm)		2794			3117			2949			3058	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	40	136	66	55	420	45	37	184	47	13	185	160
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	242	0	0	520	0	0	268	0	0	358	0
Confl. Peds. (#/hr)	26		25	25		26	29		64	64		29
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		11.5			11.5			9.6			9.6	
Effective Green, g (s)		11.5			11.5			9.6			9.6	
Actuated g/C Ratio		0.37			0.37			0.31			0.31	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1033			1152			910			943	
v/s Ratio Prot												
v/s Ratio Perm		0.09			c0.17			0.09			c0.12	
v/c Ratio		0.23			0.45			0.29			0.38	
Uniform Delay, d1		6.8			7.4			8.2			8.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			0.3			0.2			0.3	
Delay (s)		6.9			7.7			8.4			8.7	
Level of Service		A			A			A			A	
Approach Delay (s)		6.9			7.7			8.4			8.7	
Approach LOS		A			A			A			A	

Intersection Summary				
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	31.1	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	77.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Cooke St & Queen St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	433	55	49	350	57	37	412	47	32	242	82
Future Volume (vph)	129	433	55	49	350	57	37	412	47	32	242	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		1.00			1.00			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.98			0.99			0.97	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3443			3442			3455			3361	
Flt Permitted		0.76			0.84			0.90			0.88	
Satd. Flow (perm)		2629			2919			3131			2980	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	134	451	57	51	365	59	39	429	49	33	252	85
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	642	0	0	475	0	0	517	0	0	370	0
Confl. Peds. (#/hr)	21		31	31		21	64		70	70		64
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		18.2			18.2			15.9			15.9	
Effective Green, g (s)		18.2			18.2			15.9			15.9	
Actuated g/C Ratio		0.41			0.41			0.36			0.36	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1084			1204			1128			1074	
v/s Ratio Prot												
v/s Ratio Perm		c0.24			0.16			c0.17			0.12	
v/c Ratio		0.59			0.39			0.46			0.34	
Uniform Delay, d1		10.1			9.1			10.8			10.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.2			0.3			0.2	
Delay (s)		10.9			9.3			11.1			10.5	
Level of Service		B			A			B			B	
Approach Delay (s)		10.9			9.3			11.1			10.5	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	44.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2020 PEAK PERIOD TRAFFIC
ANALYSIS WITHOUT PROJECT

HCM Unsignalized Intersection Capacity Analysis
1: Keawe St & Halekauwila St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	89	29	30	110	12	25	30	12	24	63	22
Future Volume (vph)	11	89	29	30	110	12	25	30	12	24	63	22
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	13	106	35	36	131	14	30	36	14	29	75	26

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	154	181	80	130
Volume Left (vph)	13	36	30	29
Volume Right (vph)	35	14	14	26
Hadj (s)	-0.09	0.03	0.00	-0.04
Departure Headway (s)	4.6	4.6	4.9	4.8
Degree Utilization, x	0.20	0.23	0.11	0.17
Capacity (veh/h)	738	732	680	698
Control Delay (s)	8.7	9.0	8.5	8.8
Approach Delay (s)	8.7	9.0	8.5	8.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.8	
Level of Service			A	
Intersection Capacity Utilization			33.3%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1: Keawe St & Halekauwila St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	361	57	59	115	18	14	38	31	58	86	21
Future Volume (vph)	21	361	57	59	115	18	14	38	31	58	86	21
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	22	376	59	61	120	19	15	40	32	60	90	22

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	457	200	87	172
Volume Left (vph)	22	61	15	60
Volume Right (vph)	59	19	32	22
Hadj (s)	-0.03	0.04	-0.15	0.03
Departure Headway (s)	5.0	5.4	5.8	5.8
Degree Utilization, x	0.63	0.30	0.14	0.28
Capacity (veh/h)	701	623	530	556
Control Delay (s)	16.0	10.6	9.7	11.0
Approach Delay (s)	16.0	10.6	9.7	11.0
Approach LOS	C	B	A	B

Intersection Summary				
Delay			13.3	
Level of Service			B	
Intersection Capacity Utilization			55.0%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
2: Keawe St & Queen St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	239	65	58	612	9	19	0	25	9	2	59
Future Volume (Veh/h)	8	239	65	58	612	9	19	0	25	9	2	59
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	266	72	64	680	10	21	0	28	10	2	66
Pedestrians								29				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								3				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					610							
pX, platoon unblocked												
vC, conflicting volume	690			367			884	1167	198	992	1198	345
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	690			367			884	1167	198	992	1198	345
tC, single (s)	*3.1			*3.1			*6.5	6.5	*5.9	*6.5	*5.5	*5.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			92	100	97	96	99	91
cM capacity (veh/h)	1099			1285			254	176	834	241	239	719

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	142	205	404	350	49	78
Volume Left	9	0	64	0	21	10
Volume Right	0	72	0	10	28	66
cSH	1099	1700	1285	1700	422	551
Volume to Capacity	0.01	0.12	0.05	0.21	0.12	0.14
Queue Length 95th (ft)	1	0	4	0	10	12
Control Delay (s)	0.6	0.0	1.7	0.0	14.7	12.6
Lane LOS	A		A		B	B
Approach Delay (s)	0.2		0.9		14.7	12.6
Approach LOS					B	B

Intersection Summary			
Average Delay		2.0	
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)		15	

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
2: Keawe St & Queen St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	566	97	33	488	21	23	2	51	0	2	20
Future Volume (Veh/h)	31	566	97	33	488	21	23	2	51	0	2	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	33	602	103	35	519	22	24	2	54	0	2	21
Pedestrians								21				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								2				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					610							
pX, platoon unblocked												
vC, conflicting volume	541			726			1092	1352	374	1022	1392	270
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	541			726			1092	1352	374	1022	1392	270
tC, single (s)	*3.1			*3.1			*6.5	*5.5	*5.9	7.5	*5.5	*5.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			88	99	92	100	99	97
cM capacity (veh/h)	1197			1055			206	203	681	163	194	786

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	334	404	294	282	80	23
Volume Left	33	0	35	0	24	0
Volume Right	0	103	0	22	54	21
cSH	1197	1700	1055	1700	389	621
Volume to Capacity	0.03	0.24	0.03	0.17	0.21	0.04
Queue Length 95th (ft)	2	0	3	0	19	3
Control Delay (s)	1.0	0.0	1.3	0.0	16.6	11.0
Lane LOS	A		A		C	B
Approach Delay (s)	0.5		0.7		16.6	11.0
Approach LOS					C	B

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)		15	

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
3: Halekauwila St & Coral St

4/20/2017

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	128	114	12	18	13
Future Volume (Veh/h)	11	128	114	12	18	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	14	160	143	15	23	16
Pedestrians		22			13	
Lane Width (ft)		12.0			12.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		2			1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	171				352	186
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	171				352	186
tC, single (s)	*3.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1458				698	873

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	174	158	39
Volume Left	14	0	23
Volume Right	0	15	16
cSH	1458	1700	761
Volume to Capacity	0.01	0.09	0.05
Queue Length 95th (ft)	1	0	4
Control Delay (s)	0.7	0.0	10.0
Lane LOS	A		A
Approach Delay (s)	0.7	0.0	10.0
Approach LOS			A

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		31.0%	ICU Level of Service A
Analysis Period (min)		15	

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
3: Halekauwila St & Coral St

4/20/2017

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	391	152	8	19	45
Future Volume (Veh/h)	32	391	152	8	19	45
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	33	407	158	8	20	47
Pedestrians		31	1		10	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		3	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	176				646	203
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	176				646	203
tC, single (s)	*3.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				96	94
cM capacity (veh/h)	1458				506	853

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	440	166	67
Volume Left	33	0	20
Volume Right	0	8	47
cSH	1458	1700	708
Volume to Capacity	0.02	0.10	0.09
Queue Length 95th (ft)	2	0	8
Control Delay (s)	0.8	0.0	10.6
Lane LOS	A		B
Approach Delay (s)	0.8	0.0	10.6
Approach LOS			B

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		52.9%	ICU Level of Service A
Analysis Period (min)		15	

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
4: Cooke St & Halekauwila St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	46	68	31	23	54	26	18	151	35	37	194	45
Future Volume (vph)	46	68	31	23	54	26	18	151	35	37	194	45
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	51	76	34	26	60	29	20	168	39	41	216	50

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	161	115	104	123	149	158
Volume Left (vph)	51	26	20	0	41	0
Volume Right (vph)	34	29	0	39	0	50
Hadj (s)	-0.03	-0.07	0.13	-0.19	0.17	-0.19
Departure Headway (s)	5.4	5.4	5.8	5.5	5.7	5.4
Degree Utilization, x	0.24	0.17	0.17	0.19	0.24	0.24
Capacity (veh/h)	619	607	589	621	596	637
Control Delay (s)	10.0	9.5	8.8	8.5	9.3	8.8
Approach Delay (s)	10.0	9.5	8.6		9.1	
Approach LOS	B	A	A		A	

Intersection Summary				
Delay	9.2			
Level of Service	A			
Intersection Capacity Utilization	41.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
4: Cooke St & Halekauwila St

4/21/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	109	236	69	56	94	72	27	287	38	46	260	44
Future Volume (vph)	109	236	69	56	94	72	27	287	38	46	260	44
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	116	251	73	60	100	77	29	305	40	49	277	47

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	440	237	182	193	188	186
Volume Left (vph)	116	60	29	0	49	0
Volume Right (vph)	73	77	0	40	0	47
Hadj (s)	-0.01	-0.11	0.11	-0.11	0.16	-0.14
Departure Headway (s)	6.9	7.4	8.0	7.8	8.1	7.8
Degree Utilization, x	0.84	0.49	0.40	0.42	0.42	0.40
Capacity (veh/h)	505	440	416	425	418	426
Control Delay (s)	36.4	17.3	15.1	15.0	15.6	14.6
Approach Delay (s)	36.4	17.3	15.1		15.1	
Approach LOS	E	C	C		C	

Intersection Summary				
Delay	22.1			
Level of Service	C			
Intersection Capacity Utilization	65.1%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
5: Cooke St & Queen St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	129	60	50	377	41	33	166	43	12	167	144
Future Volume (vph)	37	129	60	50	377	41	33	166	43	12	167	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.99			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.99			0.97			0.93	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		3348			3465			3395			3259	
Flt Permitted		0.83			0.89			0.87			0.94	
Satd. Flow (perm)		2810			3115			2966			3062	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	42	145	67	56	424	46	37	187	48	13	188	162
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	254	0	0	526	0	0	272	0	0	363	0
Confl. Peds. (#/hr)	26		25	25		26	29		64	64		29
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			8			8	
Permitted Phases	4			4			8			8		
Actuated Green, G (s)		14.1			14.1			11.6			11.6	
Effective Green, g (s)		14.1			14.1			11.6			11.6	
Actuated g/C Ratio		0.39			0.39			0.32			0.32	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1109			1230			963			994	
v/s Ratio Prot												
v/s Ratio Perm		0.09			c0.17			0.09			c0.12	
v/c Ratio		0.23			0.43			0.28			0.37	
Uniform Delay, d1		7.2			7.9			9.0			9.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			0.2			0.2			0.2	
Delay (s)		7.3			8.1			9.1			9.5	
Level of Service		A			A			A			A	
Approach Delay (s)		7.3			8.1			9.1			9.5	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	35.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: Cooke St & Queen St

4/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	440	56	50	366	58	38	418	48	32	246	83
Future Volume (vph)	131	440	56	50	366	58	38	418	48	32	246	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		1.00			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.98			0.99			0.97	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3441			3443			3451			3356	
Flt Permitted		0.75			0.84			0.90			0.88	
Satd. Flow (perm)		2606			2920			3120			2972	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	136	458	58	52	381	60	40	435	50	33	256	86
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	652	0	0	493	0	0	525	0	0	375	0
Confl. Peds. (#/hr)	21		31	31		21	64		70	70		64
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			8			8	
Permitted Phases	4			4			8			8		
Actuated Green, G (s)		24.4			24.4			18.7			18.7	
Effective Green, g (s)		24.4			24.4			18.7			18.7	
Actuated g/C Ratio		0.46			0.46			0.35			0.35	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1197			1341			1098			1046	
v/s Ratio Prot												
v/s Ratio Perm		c0.25			0.17			c0.17			0.13	
v/c Ratio		0.54			0.37			0.48			0.36	
Uniform Delay, d1		10.3			9.3			13.4			12.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			0.2			0.3			0.2	
Delay (s)		10.9			9.5			13.7			13.0	
Level of Service		B			A			B			B	
Approach Delay (s)		10.9			9.5			13.7			13.0	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	53.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX E

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2020 PEAK PERIOD TRAFFIC
ANALYSIS WITH PROJECT

HCM Unsignalized Intersection Capacity Analysis
1: Keawe St & Halekauwila St

12/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	95	29	68	150	32	25	30	12	24	63	22
Future Volume (vph)	11	95	29	68	150	32	25	30	12	24	63	22
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	13	113	35	81	179	38	30	36	14	29	75	26

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	161	298	80	130
Volume Left (vph)	13	81	30	29
Volume Right (vph)	35	38	14	26
Hadj (s)	-0.08	0.01	0.00	-0.04
Departure Headway (s)	4.8	4.7	5.2	5.1
Degree Utilization, x	0.21	0.39	0.12	0.18
Capacity (veh/h)	705	733	621	641
Control Delay (s)	9.0	10.6	8.9	9.2
Approach Delay (s)	9.0	10.6	8.9	9.2
Approach LOS	A	B	A	A

Intersection Summary				
Delay			9.8	
Level of Service			A	
Intersection Capacity Utilization			46.3%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1: Keawe St & Halekauwila St

12/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	361	57	93	138	29	14	38	31	58	86	21
Future Volume (vph)	21	361	57	93	138	29	14	38	31	58	86	21
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	22	376	59	97	144	30	15	40	32	60	90	22

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	457	271	87	172
Volume Left (vph)	22	97	15	60
Volume Right (vph)	59	30	32	22
Hadj (s)	-0.03	0.04	-0.15	0.03
Departure Headway (s)	5.1	5.4	6.0	6.0
Degree Utilization, x	0.65	0.41	0.15	0.29
Capacity (veh/h)	679	623	498	531
Control Delay (s)	17.0	12.1	10.1	11.4
Approach Delay (s)	17.0	12.1	10.1	11.4
Approach LOS	C	B	B	B

Intersection Summary				
Delay			14.1	
Level of Service			B	
Intersection Capacity Utilization			64.0%	ICU Level of Service C
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
2: Keawe St & Queen St

12/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	253	65	58	612	9	19	0	45	9	2	59
Future Volume (Veh/h)	8	253	65	58	612	9	19	0	45	9	2	59
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	281	72	64	680	10	21	0	50	10	2	66
Pedestrians								29				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								3				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					610							
pX, platoon unblocked												
vC, conflicting volume	690			382			899	1182	206	1022	1213	345
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	690			382			899	1182	206	1022	1213	345
tC, single (s)	*3.1			*3.1			*6.5	6.5	*5.9	*6.5	*5.5	*5.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			92	100	94	96	99	91
cM capacity (veh/h)	1099			1274			249	173	826	225	235	719

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	150	212	404	350	71	78
Volume Left	9	0	64	0	21	10
Volume Right	0	72	0	10	50	66
cSH	1099	1700	1274	1700	490	539
Volume to Capacity	0.01	0.13	0.05	0.21	0.14	0.14
Queue Length 95th (ft)	1	0	4	0	13	13
Control Delay (s)	0.6	0.0	1.7	0.0	13.6	12.8
Lane LOS	A		A		B	B
Approach Delay (s)	0.2		0.9		13.6	12.8
Approach LOS					B	B

Intersection Summary				
Average Delay			2.2	
Intersection Capacity Utilization			48.3%	ICU Level of Service A
Analysis Period (min)			15	

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
2: Keawe St & Queen St

12/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	608	97	33	499	21	23	2	62	0	2	20
Future Volume (Veh/h)	31	608	97	33	499	21	23	2	62	0	2	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	33	647	103	35	531	22	24	2	66	0	2	21
Pedestrians								21				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								2				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					610							
pX, platoon unblocked												
vC, conflicting volume	553			771			1143	1408	396	1068	1449	276
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	553			771			1143	1408	396	1068	1449	276
tC, single (s)	*3.1			*3.1			*6.5	*5.5	*5.9	7.5	*5.5	*5.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			87	99	90	100	99	97
cM capacity (veh/h)	1189			1028			192	190	663	148	182	781

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	356	426	300	288	92	23
Volume Left	33	0	35	0	24	0
Volume Right	0	103	0	22	66	21
cSH	1189	1700	1028	1700	391	607
Volume to Capacity	0.03	0.25	0.03	0.17	0.24	0.04
Queue Length 95th (ft)	2	0	3	0	23	3
Control Delay (s)	1.0	0.0	1.3	0.0	17.0	11.2
Lane LOS	A		A		C	B
Approach Delay (s)	0.5		0.7		17.0	11.2
Approach LOS					C	B

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
3: Halekauwila St & Coral St

12/20/2017

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	134	122	12	18	24
Future Volume (Veh/h)	11	134	122	12	18	24
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	14	168	153	15	23	30
Pedestrians		22			13	
Lane Width (ft)		12.0			12.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		2			1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	181				370	196
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	181				370	196
tC, single (s)	*3.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	97
cM capacity (veh/h)	1450				685	864

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	182	168	53
Volume Left	14	0	23
Volume Right	0	15	30
cSH	1450	1700	776
Volume to Capacity	0.01	0.10	0.07
Queue Length 95th (ft)	1	0	5
Control Delay (s)	0.7	0.0	10.0
Lane LOS	A		A
Approach Delay (s)	0.7	0.0	10.0
Approach LOS			A

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	31.5%	ICU Level of Service	A	
Analysis Period (min)	15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
3: Halekauwila St & Coral St

12/20/2017

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	391	215	8	19	97
Future Volume (Veh/h)	32	391	215	8	19	97
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	33	407	224	8	20	101
Pedestrians		31	1		10	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		3	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	242				712	269
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	242				712	269
tC, single (s)	*3.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				96	87
cM capacity (veh/h)	1405				472	798

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	440	232	121
Volume Left	33	0	20
Volume Right	0	8	101
cSH	1405	1700	716
Volume to Capacity	0.02	0.14	0.17
Queue Length 95th (ft)	2	0	15
Control Delay (s)	0.8	0.0	11.0
Lane LOS	A		B
Approach Delay (s)	0.8	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		56.5%	ICU Level of Service B
Analysis Period (min)		15	

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
4: Cooke St & Halekauwila St

12/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	46	74	31	23	54	26	21	166	40	37	194	50
Future Volume (vph)	46	74	31	23	54	26	21	166	40	37	194	50
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	51	82	34	26	60	29	23	184	44	41	216	56

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	167	115	115	136	149	164
Volume Left (vph)	51	26	23	0	41	0
Volume Right (vph)	34	29	0	44	0	56
Hadj (s)	-0.03	-0.07	0.13	-0.19	0.17	-0.21
Departure Headway (s)	5.4	5.5	5.8	5.5	5.8	5.4
Degree Utilization, x	0.25	0.18	0.19	0.21	0.24	0.25
Capacity (veh/h)	609	594	584	618	589	632
Control Delay (s)	10.3	9.7	9.0	8.8	9.4	9.0
Approach Delay (s)	10.3	9.7	8.9		9.2	
Approach LOS	B	A	A		A	

Intersection Summary			
Delay		9.4	
Level of Service		A	
Intersection Capacity Utilization		42.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
4: Cooke St & Halekauwila St

12/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	109	236	69	56	116	72	43	296	41	46	260	70
Future Volume (vph)	109	236	69	56	116	72	43	296	41	46	260	70
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	116	251	73	60	123	77	46	315	44	49	277	74

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	440	260	204	202	188	213
Volume Left (vph)	116	60	46	0	49	0
Volume Right (vph)	73	77	0	44	0	74
Hadj (s)	-0.01	-0.10	0.15	-0.12	0.16	-0.21
Departure Headway (s)	7.2	7.8	8.4	8.1	8.4	8.0
Degree Utilization, x	0.88	0.56	0.47	0.45	0.44	0.47
Capacity (veh/h)	440	439	402	412	394	416
Control Delay (s)	43.8	20.2	17.5	16.4	16.6	16.8
Approach Delay (s)	43.8	20.2	16.9		16.7	
Approach LOS	E	C	C		C	

Intersection Summary				
Delay		25.3		
Level of Service		D		
Intersection Capacity Utilization	66.9%		ICU Level of Service	C
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
5: Cooke St & Queen St

12/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	145	60	52	377	41	33	181	43	12	170	144
Future Volume (vph)	47	145	60	52	377	41	33	181	43	12	170	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.99			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.99			0.97			0.93	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		3360			3464			3403			3261	
Flt Permitted		0.81			0.89			0.87			0.94	
Satd. Flow (perm)		2752			3094			2984			3062	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	53	163	67	58	424	46	37	203	48	13	191	162
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	283	0	0	528	0	0	288	0	0	366	0
Confl. Peds. (#/hr)	26		25	25		26	29		64	64		29
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			8			8	
Permitted Phases	4			4			8			8		
Actuated Green, G (s)		14.5			14.5			11.8			11.8	
Effective Green, g (s)		14.5			14.5			11.8			11.8	
Actuated g/C Ratio		0.40			0.40			0.33			0.33	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1099			1235			970			995	
v/s Ratio Prot												
v/s Ratio Perm		0.10			c0.17			0.10			c0.12	
v/c Ratio		0.26			0.43			0.30			0.37	
Uniform Delay, d1		7.3			7.9			9.2			9.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			0.2			0.2			0.2	
Delay (s)		7.4			8.1			9.3			9.6	
Level of Service		A			A			A			A	
Approach Delay (s)		7.4			8.1			9.3			9.6	
Approach LOS		A			A			A			A	

Intersection Summary				
HCM 2000 Control Delay		8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio		0.40		
Actuated Cycle Length (s)		36.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization		78.9%	ICU Level of Service	D
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Cooke St & Queen St

12/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	446	56	60	388	58	38	427	48	32	262	83
Future Volume (vph)	137	446	56	60	388	58	38	427	48	32	262	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		1.00			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.98			0.99			0.97	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3441			3445			3451			3362	
Flt Permitted		0.73			0.82			0.90			0.88	
Satd. Flow (perm)		2549			2843			3115			2980	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	143	465	58	62	404	60	40	445	50	33	273	86
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	666	0	0	527	0	0	535	0	0	392	0
Confl. Peds. (#/hr)	21		31	31		21	64		70	70		64
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			8			8	
Permitted Phases	4			4			8			8		
Actuated Green, G (s)		26.7			26.7			19.5			19.5	
Effective Green, g (s)		26.7			26.7			19.5			19.5	
Actuated g/C Ratio		0.48			0.48			0.35			0.35	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1211			1350			1080			1033	
v/s Ratio Prot												
v/s Ratio Perm		c0.26			0.19			c0.17			0.13	
v/c Ratio		0.55			0.39			0.50			0.38	
Uniform Delay, d1		10.5			9.5			14.5			13.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			0.2			0.4			0.2	
Delay (s)		11.0			9.7			14.8			14.0	
Level of Service		B			A			B			B	
Approach Delay (s)		11.0			9.7			14.8			14.0	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	56.2	Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX B:

Pre-Assessment Consultation Comment Letters
List of Consulted Cultural Descendants and Responses
Draft EA/201H Comments

EM

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

December 22, 2017

KIRK CALDWELL, MAYOR

BRYAN P. ANDAYA, Chair
KAPUA SPROAT, Vice Chair
DAVID C. HULIHEE
KAY C. MATSUI
RAY C. SOON

ROSS S. SASAMURA, Ex-Officio
JADE T. BUTAY, Ex-Officio

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer

RECEIVED
JAN 02 2018
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: Your Letter Dated November 28, 2017 Requesting Comments on the Environmental Assessment Pre-Assessment Consultation for Ililani Tower Workforce Housing off Keawe Street and Halekauwila Street - Tax Map Key: 2-1-051: 011 & 012

Thank you for the opportunity to comment on the proposed 41-story mixed-use development.

The existing water system is adequate to accommodate the proposed 328-residential unit and 6,059 square foot commercial mixed-use development. However, please be advised that this information is based upon current data, and therefore, the Board of Water Supply reserves the right to change any position or information stated herein up until the final approval of the building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission, and daily storage.

Water conservation measures are recommended for all proposed developments. These measures include utilization of nonpotable water for irrigation using rain catchment, drought tolerant plants, xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets.

High-rise buildings with booster pumps will be required to install water hammer arrestors or expansion tanks to reduce pressure spikes and potential main breaks in our water system.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

Water for Life . . . Ka Wai Ola

WILSON OKAMOTO CORPORATION
INNOVATORS · PLANNERS · ENGINEERS

10288-03
February 8, 2018

Mr. Ernest Lau
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania St.
Honolulu, Hawai'i 96843

Subject: Environmental Assessment (EA) Pre-Assessment Consultation for Ililani
Tax Map Keys (TMK): 2-1-051: 011 and 012
Honolulu, O'ahu, Hawai'i

Dear Mr. Lau:

Thank you for your letter dated December 22, 2017 in response to the subject pre-assessment consultation process. The scope of your comments is acknowledged and will be incorporated into the EA process moving forward.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. The Draft EA has been published and made available for downloading, review and comment in the current issue of the Office of Environmental Quality Control's (OEQC) Environmental Notice.

We appreciate your participation in the pre-assessment consultation review process.

Earl Matsukawa, AICP
Project Manager

cc: Mr. Henry Chang, Ililani LLC
Mr. Ken Takahashi, HHFDC

1907 S. Beretania Street, Suite 400 • Honolulu, Hawaii • 96826 • (808) 946-2277

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

KIRK CALDWELL
MAYOR

ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

EM

December 12, 2017

Wilson Okamoto Corporation
ATTN: Earl Matsukawa, Project Manager
1907 Beretania Street, Suite 400
Honolulu, HI 96826

RECEIVED
DEC 15 2017
WILSON OKAMOTO CORPORATION

Dear Mr. Matsukawa,

Subject: Environmental Assessment Pre-Assessment Consultation for Ihilani Tower Workforce Housing TMK: [1] 2-1-051:011

Thank you for the opportunity to review and comment. The Department of Design and Construction does not have any comments at this time.

Should you have any further questions, please call me at 768-8480.

Sincerely,

Robert J. Kroning, P.E.
Director

RJK:ms(711186)

WILSON OKAMOTO CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

10288-03
February 8, 2018

Mr. Robert Kroning, P.E.
Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawai'i 96813

Subject: Environmental Assessment (EA) Pre-Assessment Consultation for Ililani
Tax Map Keys (TMK): 2-1-051: 011 and 012
Honolulu, O'ahu, Hawai'i

Dear Mr. Kroning:

Thank you for your letter dated December 12, 2017 in response to the subject pre-assessment consultation process. We acknowledge that the Department of Design and Constructions has not comments to offer at this time.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. The Draft EA has been published and made available for downloading, review and comment in the current issue of the Office of Environmental Quality Control's (OEQC) Environmental Notice.

We appreciate your participation in the pre-assessment consultation review process.

Earl Matsukawa, AICP
Project Manager

cc: Mr. Henry Chang, Ililani LLC
Mr. Ken Takahashi, HHFDC

1907 S. Beretania Street, Suite 400 • Honolulu, Hawaii • 96826 • (808) 946-2277

DEPARTMENT OF FACILITY MAINTENANCE
CITY AND COUNTY OF HONOLULU
1000 Ulu'ohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

EM

KIRK CALDWELL
MAYOR

ROSS S. SASAMURA, P.E.
DIRECTOR AND CHIEF ENGINEER

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 17-668

December 12, 2017

Mr. Earl Matsukawa
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

RECEIVED
DEC 14 2017
WILSON OKAMOTO CORPORATION

Dear Mr. Matsukawa:

SUBJECT: Environmental Assessment (EA) Pre-Assessment Consultation for Tower Workforce Housing
TMK: (1) 2-1-051:011

Thank you for the opportunity to review and comment on the subject project.

The following are Road Division's comments:

- Once construction phase commence, install approved Best Management Practices (BMP) fronting all drainage facilities on Halekauwila Street and Keawe Street.
- During construction and upon completion of project; any Damages/deficiencies to Halekauwila Street and Keawe Street road right-of-way shall be corrected to City Standards and accepted by the City.

If you have any questions, please call Mr. Kyle Oyasato of the Division of Road Maintenance at 768-3697.

Sincerely,

Ross S. Sasamura, P. E.
Director and Chief Engineer

WILSON OKAMOTO CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

10288-03
February 8, 2018

Mr. Ross Sasamura
Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawai'i 96813

Subject: Environmental Assessment (EA) Pre-Assessment Consultation for Ililani
Tax Map Keys (TMK): 2-1-051: 011 and 012
Honolulu, O'ahu, Hawai'i

Dear Mr. Sasamura:

Thank you for your letter dated December 12, 2017 in response to the subject pre-assessment consultation process. The scope of your comments is acknowledged and will be incorporated into the EA process moving forward.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. The Draft EA has been published and made available for downloading, review and comment in the current issue of the Office of Environmental Quality Control's (OEQC) Environmental Notice.

We appreciate your participation in the pre-assessment consultation review process.

Earl Matsukawa, AICP
Project Manager

cc: Mr. Henry Chang, Ililani LLC
Mr. Ken Takahashi, HHFDC

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

FILE

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

2017/ELOG-2434(AB)

December 26, 2017

Mr. Earl Matsukawa, AICP
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

SUBJECT: Pre-Environmental Assessment Consultation
Ililani Tower Workforce Housing
Halekauwila and Keawe Streets - Kakaako
Tax Map Key 2-1-051: 011

Thank you for the opportunity to provide pre-consultation comments for the forthcoming Environmental Assessment (EA). The subject parcel is within the Kakaako Community Development District (KCDD), and is therefore under the jurisdiction of the Hawaii Community Development Authority, and not the Department of Planning and Permitting (DPP), for planning and zoning purposes. The Project will be reviewed by the Hawaii Housing Finance and Development Corporation, and not the DPP, as an affordable housing project seeking exemptions from various statutes and ordinances, pursuant to Chapter 201H of the Hawaii Revised Statutes. Nonetheless, the DPP would appreciate an opportunity to prepare comments on the Draft EA related to traffic impact and Transit Oriented Development design, as the KCDD rights-of-way will fall under the authority of the City in the future. Therefore, please submit one hard copy and one CD of the Draft EA to the DPP for review by the Traffic Review Branch and the Transit Oriented Development Division, respectively.

Thank you for the opportunity to review and comment on this Project. Should you have further questions, please contact Alex Beatty at 768-8032.

Very truly yours,

for Kathy K. Sokugawa
Acting Director

WILSON OKAMOTO CORPORATION
INNOVATORS · PLANNERS · ENGINEERS

10288-03
February 8, 2018

Ms. Kathy Sokugawa
Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawai'i 96813

Subject: Environmental Assessment (EA) Pre-Assessment Consultation for Ililani
Tax Map Keys (TMK): 2-1-051: 011 and 012
Honolulu, O'ahu, Hawai'i

Dear Ms. Sokugawa:

Thank you for your letter dated December 26, 2017 in response to the subject pre-assessment consultation process. We acknowledge that the Department of Planning and Permitting (DPP) has recognized that the project will be reviewed by the Hawai'i Housing Finance and Development Corporation, and not the DPP, as an affordable housing project seeking exemptions from various statues and ordinances, pursuant to Chapter 201H of the Hawai'i Revised Statues. A Traffic Study will be prepared and included as part of forthcoming Draft EA documentation, which will be made available for your review.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. The Draft EA has been published and made available for downloading, review and comment in the current issue of the Office of Environmental Quality Control's (OEQC) Environmental Notice.

We appreciate your participation in the pre-assessment consultation review process.

Earl Matsukawa, AICP
Project Manager

cc: Mr. Henry Chang, Ililani LLC
Mr. Ken Takahashi, HHFDC

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

EM

December 14, 2017

RECEIVED
DEC 18 2017
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, AICP
Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

Subject: Preassessment Consultation for Environmental Assessment
Ililani Tower Workforce Housing
Honolulu, Hawaii
Tax Map Key: 2-1-051: 011

In response to your letter dated November 28, 2017, regarding the abovementioned subject, the Honolulu Fire Department (HFD) requires that the following be complied with:

1. Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet from fire department access roads as measured by an approved route around the exterior of the building or facility. (National Fire Protection Association [NFPA] 1; Uniform Fire Code [UFC]™, 2012 Edition, Sections 18.2.3.2.2 and 18.2.3.2.2.1.)

   A fire department access road shall extend to within 50 feet of at least one exterior door that can be opened from the outside and that provides access to the interior of the building. (NFPA 1; UFC™, 2012 Edition, Section 18.2.3.2.1.)

2. A water supply approved by the county, capable of supplying the required fire flow for fire protection, shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter

constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ [Authority Having Jurisdiction]. (NFPA 1; UFC™, 2012 Edition, Section 18.3.1, as amended.)

3. The unobstructed width and unobstructed vertical clearance of a fire apparatus access road shall meet county requirements. (NFPA 1; UFC™, 2012 Edition, Section 18.2.3.4.1.1 and 18.2.3.4.1.2, as amended.)

4. Submit civil drawings to the HFD for review and approval.

Should you have questions, please contact Battalion Chief Wayne Masuda of our Fire Prevention Bureau at 723-7151 or wmasuda@honolulu.gov.

Sincerely,

SOCRATES D. BRATAKOS
Assistant Chief

SDB/TC:bh

WILSON OKAMOTO
CORPORATION
INNOVATORS · PLANNERS · ENGINEERS

10288-03
February 8, 2018

Mr. Socrates D. Bratakos
Assistant Chief
Honolulu Fire Department
City and County of Honolulu
636 South Street
Honolulu, Hawai'i 96813-5007

Subject: Environmental Assessment (EA) Pre-Assessment Consultation for Ililani
Tax Map Keys (TMK): 2-1-051: 011 and 012
Honolulu, O'ahu, Hawai'i

Dear Mr. Bratakos:

Thank you for your letter dated December 22, 2017 in response to the subject pre-assessment consultation process. The scope of your comments is acknowledged and will be incorporated into the EA process moving forward.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. The Draft EA has been published and made available for downloading, review and comment in the current issue of the Office of Environmental Quality Control's (OEQC) Environmental Notice.

We appreciate your participation in the pre-assessment consultation review process.

Earl Matsukawa, AICP
Project Manager

cc: Mr. Henry Chang, Ililani LLC
Mr. Ken Takahashi, HHFDC

1907 S. Beretania Street, Suite 400 • Honolulu, Hawaii • 96826 • (808) 946-2277

DAVID Y. IGE
GOVERNOR

DR. CHRISTINA M. KISHIMOTO
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF SCHOOL FACILITIES AND SUPPORT SERVICES

December 28, 2017

Mr. Earl Matsukawa, Project Manager
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

Re: Pre-Assessment Consultation for Draft Environmental Assessment for the Proposed Ililani Project, Honolulu, Oahu,TMK: 2-1-051:011

Dear Mr. Matsukawa:

The Department of Education (DOE) has the following comments for the Pre-Assessment Consultation for Draft Environmental Assessment (DEA) letter for the proposed Ililani Tower Project (Project). According to the pre-consultation information, the proposed Project is for the development of 328 multi-family housing units located on Halekauwila and Keawe Streets in Kakaako.

We estimate that when the Project is mature, and unit turnover is stabilized, we would expect roughly 40 DOE students (grades Kindergarten to 12) to reside there.

The DOE schools currently serving the proposed Project are Kaahumanu Elementary School, Washington Middle School, and McKinley High School. Kaahumanu Elementary and Washington Middle School each have classroom capacity for roughly 200 additional students, and that excess capacity is expected to remain for the next five years. McKinley High School currently has capacity for 115 additional students but that excess capacity is expected to decline in the next five years. The availability of excess capacity will change as additional residential projects, also serviced by these schools, are completed.

In 2007, the Hawaii State Legislature enacted the school impact fee program allowing for the collection of impact fees from residential projects within School Impact Fee Districts designated by the Board of Education (BOE). School Impact Fee Districts are designated for areas of high growth that require the expansion of existing schools or the construction of new schools to accommodate increased school enrollment from residential development. The proposed Project is located in the designated Kalihi to Ala Moana (KAM) School Impact Fee District. A proposed KAM impact fee amount is currently being deliberated by the BOE.

Thank you for the opportunity to comment.

Should you have any questions, please contact Heidi Meeker of the Planning Section, Facilities Development Branch, at 784-5095.

Respectfully,

Kenneth G. Masden II
Public Works Manager
Planning Section

KGM:jmb

c: Ruth Silberstein, Complex Area Superintendent, Kaimuki/McKinley/Roosevelt Complex

WILSON OKAMOTO
CORPORATION
INNOVATORS · PLANNERS · ENGINEERS

10288-03
February 8, 2018

Mr. Kenneth Madsen
Public Works Manager
State of Hawai'i
Department of Education
P.O. Box 2360
Honolulu, Hawai'i 96814

Subject: Environmental Assessment (EA) Pre-Assessment Consultation for Ililani
Tax Map Keys (TMK): 2-1-051: 011 and 012
Honolulu, O'ahu, Hawai'i

Dear Mr. Madsen:

Thank you for your letter dated December 28, 2017 in response to the subject pre-assessment consultation process. The scope of your comments is acknowledged and will be incorporated into the EA process moving forward.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. The Draft EA has been published and made available for downloading, review and comment in the current issue of the Office of Environmental Quality Control's (OEQC) Environmental Notice.

We appreciate your participation in the pre-assessment consultation review process.

Earl Matsukawa, AICP
Project Manager

cc: Mr. Henry Chang, Ililani LLC
Mr. Ken Takahashi, HHFDC

1907 S. Beretania Street, Suite 400 • Honolulu, Hawaii • 96826 • (808) 946-2277

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

KIRK CALDWELL
MAYOR

WES FRYSZTACKI
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

EM

TP12/17-711607R

December 15, 2017

RECEIVED
DEC 21 2017
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

SUBJECT: Draft Environmental Assessment (DEA) Pre-Consultation for Ililani Tower, Kakaako Community Development District (KCDD), Honolulu, Oahu, Hawaii

Thank you for the opportunity to provide pre-assessment comments on the DEA for Ililani Tower. In response to your letter dated November 28, 2017, we have the following comments:

1. **Traffic Impact Analysis Report (TIAR).** The following comments are related to the TIAR:

   a. **Transportation Assessment.** The TIAR should be replaced with a Transportation Assessment (TA) that analyzes the multi-modal nature of the Civic Center TOD neighborhood and recognizes the need for traffic control devices, streetscape and intersection improvements that encourage walking, bicycling, and transit use as the primary access modes for the proposed project.

      i. Use person trips instead of vehicle trip rates from the ITE Trip Generation Manual and assign these trips to the transportation system. This will require analysis of crossing treatments using NCHRP 562 methodology for pedestrian measures.

      ii. Define performance measures for use in the study:
         1. V/C ratio targets that are >1 for 1st and/or 2nd highest peak hours

         2. Identify where vehicle Level of Service (LOS) will not be used
         3. Pedestrian LOS
         4. Bicycle Level of Traffic Stress (LTS)
         5. Transit Capacity and Quality of Service

      iii. In addition to the calculated LOS, the observational LOS should be provided.

   b. **Multi-modal Analysis.** A multi-modal circulation analysis should be completed that includes vehicle, bicycle, and pedestrian circulation impacts and potential conflicts in the surrounding area roadways of Halekauwila Street, Keawe Street, Coral Street and Queen Street and corresponding measures to mitigate these impacts by applying Complete Streets principles. The Honolulu Authority for Rapid Transportation should be consulted regarding access to the Civic Center rail station. Complete an in-depth multi-modal analysis of the intersections of Halekauwila Street and Keawe Street that looks at the pros and cons for all travel modes.

   c. **Enhanced Pedestrian Circulation Study.** An analysis of pedestrian circulation need to be conducted to make sure safe and convenient pedestrian access to the planned rail station and other major destinations in the area. Enhanced pedestrian measures such as pedestrian scramble or leading pedestrian crossing signals should be studied at the intersections of Keawe Street and Halekauwila Street given the intersection is in the critical path to and from the Civic Center rail station.

   d. **Transportation Demand Management (TDM) Plan for New Residential Development.** As per page 7-14 of the HCDA Draft TOD Overlay Plan, the DEA shall include a TDM plan that includes the TDM strategies proposed for implementation (per Figure 7-5), mode share performance targets, a schedule for achieving mode share performance targets, and copies of documentation to ensure deed notification of mandatory participation in the final TDM program to all subsequent purchasers and owners of the project.

   e. **Parking Management Strategies.** The TA should identify parking management strategies both on- and off-street that will support the TOD Plan area. The existing parking lot usage and the number of

additional parking stalls that will be provided with this project should be included and discussed in the DEA. Parking must be accessed from an alley where feasible.

f. **TOD Parking Ratio.** The January 2017 report, Trip and Parking Generation at Transit-Oriented Developments Number NITC-RR-767, supports the conclusion that less parking is required than suggested in the Institute of Transportation Engineers (ITE) Parking Generation Manual for sites that are dense, mixed use, with low stress pedestrian environments, and adjacent to a high quality transit stop. We support the minimum TOD vehicle parking ratio, given that the Project falls within the HCDA TOD Overlay Plan area, which recommends a reduced TOD parking ratio, and is in close proximity to the future rail station.

g. **Shared Parking Analysis.** The DTS requires a Shared Parking Analysis, based on the Urban Land Institute (ULI) Shared Parking model, and a shared parking strategy. In addition to the above calculations and analysis, please include a qualitative description of how the Applicant will monitor and manage opportunities for shared parking between the various users (residents, visitors, and employees) of the parking structure.

h. **Unbundled Parking.** The DEA shall include a strategy whereby a percentage of parking is separated from the lease or purchase transaction for the primary use (unbundled parking). Parking shall be rented or obtained through a separate purchase transaction when the unit is bought or rented. This increases housing affordability for households that do not use parking.

i. **Screening Treatments for Parking.** The DTS prefers project designs that wrap structured parking with residential units or commercial floor area to maintain an active street frontage and pedestrian experience. Any unconcealed portions of garages should have enhanced landscape or other screening treatments. Specify the screening treatment for the eight-story parking structure.

j. **Transit Use and Impacts.** Include a description of how the Project will promote, encourage and monitor transit use by its residents. The application should identify the locations of all nearby bus stops that

Project residents, employees and visitors are likely to use and any improvements that are needed.

k. **Residential Bicycle Parking.** Provide sufficient on-site bike and scooter racks and secure bike storage for the residents, employees and visitors. Residential bicycle parking shall be located as close as possible to the entrances to the principal uses.

l. **Short-term Bicycle Parking.** Provide publicly accessible, ground-level, short-term bicycle and scooter parking facilities appropriate for mixed-use and commercial facilities, including bicycle corrals. Short-term bicycle parking shall be located as close as possible to the entrances to the principal uses.

m. **Bikeshare Expansion.** A bikeshare station currently exists at the corner of Halekauwila Street and Keawe Street. Please contact Bikeshare Hawaii to coordinate whether it is feasible to implement more bikeshare docking stations at this location. If Bikeshare expansion is agreed upon for the area, please include bikeshare stations and/or designated drop zones in the project plans.

n. **Service Streets.** The HCDA Draft TOD Overlay Plan (Figure 5-9, Page 5-16) proposes a new service street between Coral Street and Keawe Street. Civic Center Station Area Opportunities (page 3-23) also states a new access lane is needed to consolidate loading areas. This new service street will also function as secondary pedestrian access as depicted in Figure 5-10 of the Pedestrian Priority Streets in the KCDD of the Draft TOD Overlay Plan (page 5-26) and in Figure 5-33 of Civic Center Vision and Opportunities (page 5-97).

The project design, developed in coordination with adjacent property owners, shall include a new service street that includes this connection. This service street will have wide sidewalks, where feasible, and enhanced crossings at intersections. The DTS prefers that the proposed parking structure also be accessed from this planned service street, as opposed to Halekauwila Street, which is a primary pedestrian priority street (Figure 5-10 of the Pedestrian Priority Streets in the KCDD of the Draft TOD Overlay Plan (page 5-26)).

o. **Loading and Unloading.** All loading and unloading needs, including service delivery vehicles should be handled on-site, rather than on City

roadways. In addition, the project should be designed to accommodate TheHandi-Van para-transit vehicles on-site, which require a minimum 31-foot turning radius, a 10-foot, 6 inch height clearance, and the ability to exit the site without reversing onto public roadways.

p. **Sidewalk Improvements.** Sidewalk improvements, including wider sidewalks and reduced curb cuts, shall be made along Halekauwila Street as per page 5-89 of the HCDA Draft TOD Overlay Plan.

q. **Driveway Design.** Driveways to the project site should be designed with the highest pedestrian and bicycle safety measures. Driveways should be located as far from intersections as possible.

r. **Vehicle Parking Ramps.** The vehicle parking ramps should be designed to accommodate demands so that vehicles will not queue onto Halekauwila Street and block the roadway.

2. **Complete Streets.** The following comments are related to Complete Streets:

a. **Consistency with Complete Streets Policies.** The DEA should contain a discussion of compliance with County and State Complete Streets policies, pursuant to Act 54, Session Laws of Hawaii 2009, HRS §264-20.5 and ROH 12-15. The Project should elaborate on how it will comply with Complete Streets policies, including specific adherence to the following key Complete Streets principles: 1) safety; 2) Context Sensitive Solutions; 3) accessibility and mobility for all; 4) use and comfort of all users; 5) consistency of design guidelines and standards; 6) energy efficiency; 7) health; and 8) green infrastructure.

b. **Complete Streets Improvements.** The DEA should evaluate whether improvements and facilities are needed to aid vehicular, pedestrian, bicycle and public transportation circulation by implementing Complete Streets principles. To the extent practicable, the design of the project should be consistent with the City's Complete Streets ordinance and include features to encourage walking, bicycling and public transit.

c. **Complete Streets Furniture Zone.** The applicant shall be responsible for maintaining any landscape strips, vegetation, green

stormwater infrastructure and/or street trees required as part of the Complete Streets furniture zone.

3. **Priority Guidelines on Sustainability.** The following comments are related to sustainability

Green Building Certification. In addressing priority guidelines on sustainability through HRS § 226-108, the Project should consider certification by a green building rating system, including but not limited to nationally recognized rating systems such as Leadership in Energy and Environmental Design (LEED), the Living Building Challenge, Green Globes, or another comparable State-approved, nationally recognized, and consensus-based guideline, standard, or system.

The DTS supports certification such as the LEED for Building Design and Construction Version 4.0 as it mitigates Location and Transportation (LT) impacts including but not limited to: a) minimizing the environmental harms associated with parking facilities, including automobile dependence, land consumption, and rainwater runoff; b) reducing pollution by promoting alternatives to conventionally fueled automobiles; c) increasing access to quality transit; d) reducing Vehicle Miles Traveled (VMT) through the integration of bicycle facilities; and e) compact, walkable development that encourages a density and diversity of surrounding uses.

4. **Construction Impacts.** The following comments are related to short-term construction impacts:

a. **Traffic Management Plan (TMP).** The DEA should include a Traffic Management Plan, which discusses traffic impacts the project may have on any surrounding City roadways, including short-term impacts during construction and long-term impacts after construction with corresponding measures to mitigate these impacts by applying Complete Streets principles.

b. **Best Practice TMPs.** Best practice TMPs provide the City with information by which to monitor construction areas. The City will require cameras where sidewalks are closed to help assess effectiveness of management.

c. **Joint TMP Review.** The TMP shall be jointly reviewed and accepted by the City's Department of Transportation Services and the Department of Planning and Permitting.

d. **Construction Materials and Equipment.** Construction materials and equipment should be transferred to and from the project site during off-peak traffic hours (8:30 a.m. to 3:30 p.m.) to minimize any possible disruption to traffic on the local streets.

e. **Safety Measures for Existing Access.** Any existing pedestrian, bicycle and vehicle access/crossing will be maintained with the highest safety measures during construction.

f. **Best Management Practice Controls.** Best Management Practice controls should be included at construction site to prevent trailing of dirt and debris on City roadways.

g. **Americans with Disabilities Act (ADA) Requirements.** Any damage to the existing roadway that is caused by the project should be repaired to current City standards as well as meet Americans with Disabilities Act requirements.

h. **Neighborhood Impacts.** The area Neighborhood Board, as well as the area businesses, emergency personnel (fire, ambulance and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details of the proposed project and the impacts that the project may have on the adjoining local street area network.

i. **Street Usage Permits.** A street usage permit from the City's Department of Transportation Services should be obtained for any construction-related work that may require the temporary closure of any traffic lane on a City street.

j. **Public Transit Service Area.** The project is in an existing public transit service area. To ensure that the project development does not affect public transit services (bus operations, bus routes, bus stops and para-transit operations); submit project plans to DTS – Public Transit Division (PTD) for review and approval. Contact DTS-PTD at 768-8396, 768-8370, 769-8374 or TheBusStop@honolulu.gov.

5. **Disability and Communication Access Board.** Project plans (interior and exterior layouts, vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, reduced-width traffic lanes, etc.) should be reviewed and approved by the Disability and Communication Access Board to ensure full compliance with the ADA.

We reserve further comment pending review of the DEA.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Nicola Szibbo of my staff at 768-8359.

Very truly yours,

Wes Frysztacki
Director

cc: Ken Takahashi, HHFDC

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

KIRK CALDWELL
MAYOR

WES FRYSZTACKI
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

EM

TP12/17-711607R

December 15, 2017

RECEIVED
DEC 21 2017
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Matsukawa:

SUBJECT: Draft Environmental Assessment (DEA) Pre-Consultation for Ililani Tower, Kakaako Community Development District (KCDD), Honolulu, Oahu, Hawaii

Thank you for the opportunity to provide pre-assessment comments on the DEA for Ililani Tower. In response to your letter dated November 28, 2017, we have the following comments:

1. **Traffic Impact Analysis Report (TIAR).** The following comments are related to the TIAR:

   a. **Transportation Assessment.** The TIAR should be replaced with a Transportation Assessment (TA) that analyzes the multi-modal nature of the Civic Center TOD neighborhood and recognizes the need for traffic control devices, streetscape and intersection improvements that encourage walking, bicycling, and transit use as the primary access modes for the proposed project.

      i. Use person trips instead of vehicle trip rates from the ITE Trip Generation Manual and assign these trips to the transportation system. This will require analysis of crossing treatments using NCHRP 562 methodology for pedestrian measures.

      ii. Define performance measures for use in the study:
         1. V/C ratio targets that are >1 for 1st and/or 2nd highest peak hours

         2. Identify where vehicle Level of Service (LOS) will not be used
         3. Pedestrian LOS
         4. Bicycle Level of Traffic Stress (LTS)
         5. Transit Capacity and Quality of Service

      iii. In addition to the calculated LOS, the observational LOS should be provided.

   b. **Multi-modal Analysis.** A multi-modal circulation analysis should be completed that includes vehicle, bicycle, and pedestrian circulation impacts and potential conflicts in the surrounding area roadways of Halekauwila Street, Keawe Street, Coral Street and Queen Street and corresponding measures to mitigate these impacts by applying Complete Streets principles. The Honolulu Authority for Rapid Transportation should be consulted regarding access to the Civic Center rail station. Complete an in-depth multi-modal analysis of the intersections of Halekauwila Street and Keawe Street that looks at the pros and cons for all travel modes.

   c. **Enhanced Pedestrian Circulation Study.** An analysis of pedestrian circulation need to be conducted to make sure safe and convenient pedestrian access to the planned rail station and other major destinations in the area. Enhanced pedestrian measures such as pedestrian scramble or leading pedestrian crossing signals should be studied at the intersections of Keawe Street and Halekauwila Street given the intersection is in the critical path to and from the Civic Center rail station.

   d. **Transportation Demand Management (TDM) Plan for New Residential Development.** As per page 7-14 of the HCDA Draft TOD Overlay Plan, the DEA shall include a TDM plan that includes the TDM strategies proposed for implementation (per Figure 7-5), mode share performance targets, a schedule for achieving mode share performance targets, and copies of documentation to ensure deed notification of mandatory participation in the final TDM program to all subsequent purchasers and owners of the project.

   e. **Parking Management Strategies.** The TA should identify parking management strategies both on- and off-street that will support the TOD Plan area. The existing parking lot usage and the number of

additional parking stalls that will be provided with this project should be included and discussed in the DEA. Parking must be accessed from an alley where feasible.

f. **TOD Parking Ratio.** The January 2017 report, Trip and Parking Generation at Transit-Oriented Developments Number NITC-RR-767, supports the conclusion that less parking is required than suggested in the Institute of Transportation Engineers (ITE) Parking Generation Manual for sites that are dense, mixed use, with low stress pedestrian environments, and adjacent to a high quality transit stop. We support the minimum TOD vehicle parking ratio, given that the Project falls within the HCDA TOD Overlay Plan area, which recommends a reduced TOD parking ratio, and is in close proximity to the future rail station.

g. **Shared Parking Analysis.** The DTS requires a Shared Parking Analysis, based on the Urban Land Institute (ULI) Shared Parking model, and a shared parking strategy. In addition to the above calculations and analysis, please include a qualitative description of how the Applicant will monitor and manage opportunities for shared parking between the various users (residents, visitors, and employees) of the parking structure.

h. **Unbundled Parking.** The DEA shall include a strategy whereby a percentage of parking is separated from the lease or purchase transaction for the primary use (unbundled parking). Parking shall be rented or obtained through a separate purchase transaction when the unit is bought or rented. This increases housing affordability for households that do not use parking.

i. **Screening Treatments for Parking.** The DTS prefers project designs that wrap structured parking with residential units or commercial floor area to maintain an active street frontage and pedestrian experience. Any unconcealed portions of garages should have enhanced landscape or other screening treatments. Specify the screening treatment for the eight-story parking structure.

j. **Transit Use and Impacts.** Include a description of how the Project will promote, encourage and monitor transit use by its residents. The application should identify the locations of all nearby bus stops that

Project residents, employees and visitors are likely to use and any improvements that are needed.

k. **Residential Bicycle Parking.** Provide sufficient on-site bike and scooter racks and secure bike storage for the residents, employees and visitors. Residential bicycle parking shall be located as close as possible to the entrances to the principal uses.

l. **Short-term Bicycle Parking.** Provide publicly accessible, ground-level, short-term bicycle and scooter parking facilities appropriate for mixed-use and commercial facilities, including bicycle corrals. Short-term bicycle parking shall be located as close as possible to the entrances to the principal uses.

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We reserve further comment pending review of the DEA.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Nicola Szibbo of my staff at 768-8359.

Very truly yours,

Wes Frysztacki
Director

cc: Ken Takahashi, HHFDC

WILSON OKAMOTO
CORPORATION
INNOVATORS · PLANNERS · ENGINEERS

10288-03
February 8, 2018

Mr. Wes Frysztacki
Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawai'i 96813

Subject: Environmental Assessment (EA) Pre-Assessment Consultation for Ililani
Tax Map Keys (TMK): 2-1-051: 011 and 012
Honolulu, O'ahu, Hawai'i

Dear Mr. Frysztacki:

Thank you for your letter dated December 15, 2017 in response to the subject pre-assessment consultation process. The scope of your comments is acknowledged and will be incorporated into the EA process moving forward.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. The Draft EA has been published and made available for downloading, review and comment in the current issue of the Office of Environmental Quality Control's (OEQC) Environmental Notice.

We appreciate your participation in the pre-assessment consultation review process.

Earl Matsukawa, AICP
Project Manager

cc: Mr. Henry Chang, Ililani LLC
Mr. Ken Takahashi, HHFDC

1907 S. Beretania Street, Suite 400 • Honolulu, Hawaii • 96826 • (808) 946-2277

Dear Earl Matsukawa,

SUBJECT: Ililani Tower Workforce Housing

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your letter dated November 28, 2017.

Hawaii's environmental review laws require Environmental Assessments (EAs) and Environmental Impact Statements (EISs) to consider health in the discussion and the mitigation measures to reduce negative impacts. In its definition of 'impacts,' §11-200-2, Hawaii Administrative Rules (HAR) includes health effects, whether primary (direct), secondary (indirect), or cumulative. Further, §11-200-12(b)(5), HAR, lists public health as one of the criteria for determining whether an action may have a significant impact on the environment.

We advocate that you consider health from a broad perspective; one that accounts for the social, economic, and environmental determinants of health and wellbeing. Community well-being can be impacted by access to physical activity, health care, feelings of social connectedness and safety. Design solutions that take these factors into consideration positively contribute to the social determinants of health in a community, improving the well-being of those who live there by influencing health promoting behaviors. Social determinants contribute to preventable chronic diseases such as asthma, diabetes, obesity, and cardiovascular disease.

In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments to support sustainable healthy design are provided at: http://health.hawaii.gov/epo/landuse. Projects are required to adhere to all applicable standard comments.

We suggest you review the requirements of the Clean Water Branch (Hawaii Administrative Rules {HAR}, Chapter 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: http://health.hawaii.gov/cwb. If you have any questions, please contact the Clean Water Branch (CWB), Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov. If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

If temporary fugitive dust emissions could be emitted when the project site is prepared for construction and/or when construction activities occur, we recommend you review the need and/or requirements for a Clean Air Branch (CAB) permit (HAR, Chapter 11-60.1 "Air Pollution Control"). Effective air pollution control measures need to be provided to prevent or minimize any fugitive dust emissions caused by construction work from affecting the surrounding areas. This includes the off-site roadways used to enter/exit the project. The control measures could include, but are not limited to, the use of water wagons, sprinkler systems, and dust fences. For questions contact the Clean Air Branch via e-mail at: Cab.General@doh.hawaii.gov or call (808) 586-4200.

Any waste generated by the project (that is not a hazardous waste as defined in state hazardous waste laws and regulations), needs to be disposed of at a solid waste management facility that complies with the applicable provisions (HAR, Chapter 11-58.1 "Solid Waste Management Control"). The open burning of any of these wastes, on or off site, is strictly prohibited. You may wish you review the Minimizing Construction & Demolition Waste Management Guide at: http://health.hawaii.gov/shwb/files/2016/05/constdem16.pdf Additional information is accessible at: http://health.hawaii.gov/shwb. For specific questions call (808) 586-4226.

If noise created during the construction phase of the project may exceed the maximum allowable levels (HAR, Chapter 11-46, "Community Noise Control") then a noise permit may be required and needs to be obtained before the commencement of work. Relevant information is online at: http://health.hawaii.gov/irhb/noise EPO recommends you contact the Indoor and Radiological Health Branch (IRHB) at (808) 586-4700 with any specific questions.

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: https://eha-cloud.doh.hawaii.gov. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

The Hawaii Disability and Communication Access Board (DCAB) recommends the inclusion of access for persons with disabilities through all phases of design and construction. New construction and alteration work shall comply with all applicable accessibility requirements. Projects covered by §103-50, Hawaii Revised Statutes, and Hawaii Administrative Rules Title 11 Chapter 216 shall seek advice and recommendations from DCAB on any construction plans prior to commencing with construction. If you have any questions please contact DCAB at (808) 586-8121 or dcab@doh.hawaii.gov.

To better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed an environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: http://www.epa.gov/ejscreen.

We hope this information is helpful. If you have any questions please contact us at DOH.epo@doh.hawaii.gov or call us at (808) 586-4337. Thank you for the opportunity to comment.

Mahalo nui loa,

Laura Leialoha Phillips McIntyre, AICP
Environmental Planning Office
EPO Project Number 17-315

Please be advised:
The Environmental Planning Office (EPO), along with the Clean Air, Clean Water, and Wastewater Branches will be moving in November 2017. The new address, for EPO, as of December 1, 2017, will be:
Environmental Planning Office, DOH, Hale Ola, 2827 Waimano Home Road #109, Pearl City, Hawaii 96782
Please feel free to come and visit our new offices anytime. Please note that there is a security guard at the bottom of the hill (before entering DOH property). Our office phone numbers, email and website will all remain the same.

Laura L. McIntyre, AICP
Manager, Environmental Planning Office
Hawaii State Department of Health
Phone: (808) 321-2601
Email: laura.mcintyre@doh.hawaii.gov
Website: http://health.hawaii.gov/epo
2827 Waimano Home Road #109, Pearl City, Hawaii 96782

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10288-03
February 8, 2018

Ms. Laura Leialoha Phillips McIntyre, AICP
Program Manager
Environmental Planning Office
Department of Health
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

Subject: Environmental Assessment (EA) Pre-Assessment Consultation for Ililani
Tax Map Keys (TMK): 2-1-051: 011 and 012
Honolulu, O'ahu, Hawai'i

Dear Ms. McIntyre:

Thank you for your letter dated December 27, 2017 in response to the subject pre-assessment consultation process. The scope of your comments is acknowledged and will be incorporated into the EA process moving forward.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. The Draft EA has been published and made available for downloading, review and comment in the current issue of the Office of Environmental Quality Control's (OEQC) Environmental Notice.

We appreciate your participation in the pre-assessment consultation review process.

Earl Matsukawa, AICP
Project Manager

cc: Mr. Henry Chang, Ililani LLC
Mr. Ken Takahashi, HHFDC

1907 S. Beretania Street, Suite 400 • Honolulu, Hawaii • 96826 • (808) 946-2277

UNIVERSITY of HAWAI'I®
MĀNOA

Water Resources Research Center

EM

December 7, 2017

RECEIVED
DEC 18 2017
WILSON OKAMOTO CORPORATION

Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu HI 96826
Attention: Mr. Earl Matsukawa, Project Manager

Mr. Matsukawa:

This is to acknowledge receipt of your letter for review of a draft Environmental Assessment for the Ililani Tower Workforce Housing project.

Unfortunately, the Water Resources Research Center does not have the capacity to review the draft environmental impact statement at this time due to the faculty position vacancy.

While we continue to explore filling the current vacancy, the Center will exclude itself from commentary on this specific environmental assessment study.

Sincerely,

Darren T. Lerner, PhD
Interim Director

2540 Dole Street, Holmes Hall 283
Honolulu, Hawai'i 96822
Telephone: (808) 956-7847
Fax: (808) 956-5044
An Equal Opportunity/Affirmative Action Institution

WILSON OKAMOTO
CORPORATION
INNOVATORS · PLANNERS · ENGINEERS

10288-03
February 8, 2018

Mr. Darren T. Lerner
Interim Director
University of Hawaii
Water Resources Research Center
2540 Dole Street, Holmes Hall 283
Honolulu, Hawai'i 96822

Subject: Environmental Assessment (EA) Pre-Assessment Consultation for Ililani
Tax Map Keys (TMK): 2-1-051: 011 and 012
Honolulu, O'ahu, Hawai'i

Dear Dr. Lerner:

Thank you for your letter dated December 7, 2017 in response to the subject pre-assessment consultation process. We acknowledge that the Water Resources Research Center lacks the capacity to participate in the review of documentation pursuant to the EA process.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. The Draft EA has been published and made available for downloading, review and comment in the current issue of the Office of Environmental Quality Control's (OEQC) Environmental Notice.

We appreciate your participation in the pre-assessment consultation review process.

Earl Matsukawa, AICP
Project Manager

cc: Mr. Henry Chang, Ililani LLC
Mr. Ken Takahashi, HHFDC

1907 S. Beretania Street, Suite 400 • Honolulu, Hawaii • 96826 • (808) 946-2277

LIST OF CONSULTED CULTURAL DESCENDANTS

The cultural descendants recognized by the O'ahu Island Burial Council to this project are:

1) Mana Kaleilani Caceres
2) Kalehua Kamohalii Caceres
3) Makoa Kamohalii Caceres
4) Kama'ehu Kamohalii Caceres
5) Hiehie Kamohalii Caceres
6) Kamana Kamohalii Caceres

Consultation with cultural descendants began before the project proponents met with any other stakeholder group out of respect to the sensitivity of the area and the Hawaiian culture.

The first meeting with cultural descendants was held on February 13, 2017 as a courtesy introduction to the project and to seek input on cultural and other matters. Invitations were sent to cultural descendants that were recognized to past projects (i.e. Transit/Rail, Stanford Carr Development projects, Kawaiaha'o Church., Waihonua etc.).

Cultural descendants that attended the first consultation meeting were:

1) Paulette Ka'anohi Kaleikini
2) Ali'ikaua Kaleikini
3) Kala Keli'inoi
4) Mana Caceres
5) Kalehua Caceres
6) Kama'ehu Caceres
7) Hiehie Caceres
8) Kamana Caceres
9) Michael Lee
10) Donna Makaiwi
11) Daron Makaiwi
12) William Ho'ohuli
13) Kim Ho'ohuli
14) Kaira Ho'ohuli
15) Doris Branigan
16) Steven Poe

APPENDIX B PART II

Draft EA Comments & 201H Exemption/Deferral Documentation

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

EPO 18-035

February 15, 2018

Mr. Keola Cheng
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826
Email: kcheng@wilsonokamoto.com

Dear Mr. Cheng:

SUBJECT: Draft Environmental Assessment (DEA) for Ililani Condominium Project, Oahu
TMK: (1) 2-1-051: 011 and 012

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your DEA to our office via the OEQC link:
http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2018-02-08-OA-DEA-Ililani-Condominium.pdf

We understand from the OEQC publication form project summary that *"Ililani is envisioned as a mixed-use development consisting of approximately 328 affordable and market-rate for sale residential units in a 41 story tower with retail space on the 1st floor (42-stories total). The project, located in Kakaako, includes an eight-story parking structure plus a recreational deck on the 9th floor. One of the rail transit stations proposed by the Honolulu Authority for Rapid Transportation (HART) will be located on the 'Ewa side of the building along Halekauwila Street within 130 yards of the site."*

Hawaii's environmental review laws require Environmental Assessments (EAs) and Environmental Impact Statements (EISs) to consider health in the discussion and the mitigation measures to reduce negative impacts. In its definition of 'impacts,' §11-200-2, Hawaii Administrative Rules (HAR) includes health effects, whether primary (direct), secondary (indirect), or cumulative. Further, §11-200-12(b)(5), HAR, lists public health as one of the criteria for determining whether an action may have a significant impact on the environment.

We advocate that you consider health from a broad perspective; one that accounts for the social, economic, and environmental determinants of health and wellbeing. Community well-being can be impacted by access to physical activity, health care, feelings of social connectedness and safety. Design solutions that take these factors into consideration positively contribute to the social determinants of health in a community, improving the well-being of those who live there by influencing health promoting behaviors. Social determinants contribute to preventable chronic diseases such as asthma, diabetes, obesity, and cardiovascular disease.

An example of social influences include access to safe pedestrian corridors such as pathways, sidewalks, bike lanes, greenways and open space. §11-200-17(h), HAR, says EISs must discuss how proposed actions may conform or conflict with any policies for the affected area. This includes Hawaii's 2009 Complete Streets law, which requires the state and counties to establish policies to accommodate all users of the road, no matter age, ability, or mode of transportation. In 2015, Hawaii passed Act 97 which amended Hawaii's Renewable Portfolio Standards by setting a goal for Hawaii to become one hundred percent renewable by the year 2045. To reach this goal Hawaii should transform its transportation sector from the use of fossil fuels to renewable fuel, electric vehicles (EV)s, and public transit systems including bikeshare programs. To address "range anxiety" and facilitate the adoption of EVs, it is

essential that EV charging stations be added to any planned parking areas open to the EV driving public. Plans should strive to encourage the use of personal bicycles though the development of designated bike lanes and class A bike trails. All efforts should be made to reduce harmful vehicle emissions, reduce vehicle miles travelled (VMT's), encourage alternative modes of transport and increase physical activity.

In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments to support sustainable healthy design are provided at: http://health.hawaii.gov/epo/landuse. Projects are required to adhere to all applicable standard comments.

If you haven't already, EPO recommends that you review the new Healthy Communities Policy Guide: https://planning-org-uploaded-media.s3.amazonaws.com/document/Healthy-Communities-Policy-Guide.pdf, Plan4health website: http://plan4health.us and the free, on-demand, six part Plan4Health webinar series available on the American Planning Association website.

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: https://eha-cloud.doh.hawaii.gov. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

We suggest you review the requirements of the Clean Water Branch (Hawaii Administrative Rules {HAR}, Chapter 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: http://health.hawaii.gov/cwb. If you have any questions, please contact the Clean Water Branch (CWB), Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov. If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

Please note that all wastewater plans must conform to applicable provisions (HAR, Chapter 11-62, "Wastewater Systems"). We reserve the right to review the detailed wastewater plans for conformance to applicable rules. Should you have any questions, please review online guidance at: http://health.hawaii.gov/wastewater and contact the Planning and Design Section of the Wastewater Branch (WWB) at (808) 586-4294.

If temporary fugitive dust emissions could be emitted when the project site is prepared for construction and/or when construction activities occur, we recommend you review the need and/or requirements for a Clean Air Branch (CAB) permit (HAR, Chapter 11-60.1 "Air Pollution Control"). Effective air pollution control measures need to be provided to prevent or minimize any fugitive dust emissions caused by construction work from affecting the surrounding areas. This includes the off-site roadways used to enter/exit the project. The control measures could include, but are not limited to, the use of water wagons, sprinkler systems, and dust fences. For questions contact the Clean Air Branch via e-mail at: Cab.General@doh.hawaii.gov or call (808) 586-4200.

Any waste generated by the project (that is not a hazardous waste as defined in state hazardous waste laws and regulations), needs to be disposed of at a solid waste management facility that complies with the applicable provisions (HAR, Chapter 11-58.1 "Solid Waste Management Control"). The open burning of any of these wastes, on or off site, is strictly prohibited. You may wish you review the Minimizing Construction & Demolition Waste Management Guide at: http://health.hawaii.gov/shwb/files/2016/05/constdem16.pdf Additional information is accessible at: http://health.hawaii.gov/shwb. For specific questions call (808) 586-4226.

If noise created during the construction phase of the project may exceed the maximum allowable levels (HAR, Chapter 11-46, "Community Noise Control") then a noise permit may be required and needs to be obtained before the commencement of work. Relevant information is online at: http://health.hawaii.gov/irhb/noise EPO recommends you contact the Indoor and Radiological Health Branch (IRHB) at (808) 586-4700 with any specific questions.

A phase I Environmental Site Assessment (ESA) and site investigation should be conducted for residential development or redevelopment projects in current or formerly used industrial areas and on formerly and currently zoned agricultural land used for growing sugar, pineapple or other agricultural products. If the investigation shows that a release of petroleum, hazardous substance, pollutants or contaminants may have occurred at the site, the site should be properly characterized through an approved Hawaii State Department of Health (DOH)/Hazard Evaluation and Emergency Response Office (HEER) soil and/or groundwater sampling plan. Please refer to Sections 3 and 4 of the HEER Office Technical Guidance Manual http://www.hawaiidoh.org.

If the site is found to be contaminated, then all removal and remedial actions to clean up hazardous substance or oil releases by past and present owners/tenants must comply with State Law (HRS, Chapter 128D, "Environmental Response Law", Chapter 451, "State Contingency Plan"). To identify HEER records related to the property, visit http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/public-records. For information on site assessment and cleanup programs review: http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/site-assessment-and-cleanup-programs. Any specific questions should be directed to the HEER office at (808) 586-4249.

The Hawaii Disability and Communication Access Board (DCAB) recommends the inclusion of access for persons with disabilities through all phases of design and construction. New construction and alteration work shall comply with all applicable accessibility requirements. Projects covered by §103-50, Hawaii Revised Statutes, and HAR Title 11 Chapter 216 shall seek advice and recommendations from DCAB on any construction plans prior to commencing with construction. If you have any questions please contact DCAB at (808) 586-8121 or dcab@doh.hawaii.gov.

You may also wish to review the draft Office of Environmental Quality Control (OEQC) viewer at: http://eha-web.doh.hawaii.gov/oeqc-viewer. This viewer geographically shows where some previous Hawaii Environmental Policy Act (HEPA) {Hawaii Revised Statutes, Chapter 343} documents have been prepared.

To better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed an environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: http://www.epa.gov/ejscreen.

We hope this information is helpful. If you have any questions please contact us at DOH.epo@doh.hawaii.gov or call us at (808) 586-4337. Thank you for the opportunity to comment.

Mahalo nui loa,

Laura Leialoha Phillips McIntyre, AICP
Environmental Planning Office

LM:nn

c: Henry Chang, Ililani LLC (via email: changh11@gmail.com)
Ken Takahashi, Hawaii Housing Finance & Dev. Corp. (via email: ken.t.takahashi@hawaii.gov)
DOH: EMD, CWB, CAB, WWB, IRHB, DCAB, PHP {via email only}

Attachment: U.S. EPA EJSCREEN Report for Project Area

Attachment: U.S. EPA EJSCREEN Report for Project Area

EJSCREEN Report (Version 2017)

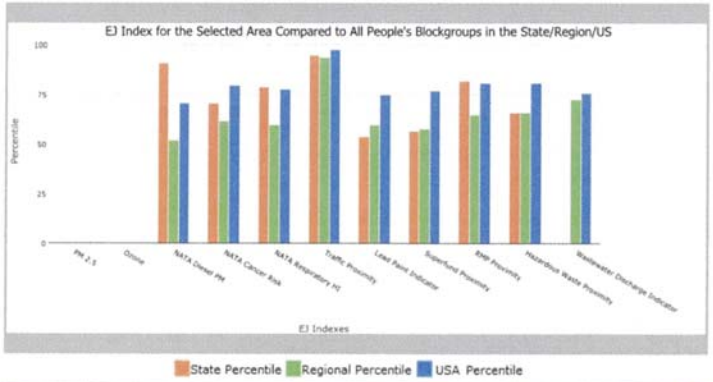
1 mile Ring Centered at 21.300939,-157.858186, HAWAII, EPA Region 9

Approximate Population: 33,390

Input Area (sq. miles): 3.14

(The study area contains 1 blockgroup(s) with zero population.)

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	91	52	71
EJ Index for NATA* Air Toxics Cancer Risk	71	62	80
EJ Index for NATA* Respiratory Hazard Index	79	60	78
EJ Index for Traffic Proximity and Volume	95	94	98
EJ Index for Lead Paint Indicator	54	60	75
EJ Index for Superfund Proximity	57	58	77
EJ Index for RMP Proximity	82	65	81
EJ Index for Hazardous Waste Proximity	66	66	81
EJ Index for Wastewater Discharge Indicator	N/A	73	76



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

February 14, 2018

EJSCREEN Report (Version 2017)

1 mile Ring Centered at 21.300939,-157.858186, HAWAII, EPA Region 9

Approximate Population: 33,390

Input Area (sq. miles): 3.14

(The study area contains 1 blockgroup(s) with zero population.)

February 14, 2018

Digitized Point

1:1,128

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2017)

1 mile Ring Centered at 21.300939,-157.858186, HAWAII, EPA Region 9

Approximate Population: 33,390

Input Area (sq. miles): 3.14

(The study area contains 1 blockgroup(s) with zero population.)

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	N/A	N/A	N/A	9.9	N/A	9.14	N/A
Ozone (ppb)	N/A	N/A	N/A	41.8	N/A	38.4	N/A
NATA* Diesel PM (µg/m³)	0.522	0.149	95	0.978	<50th	0.938	<50th
NATA* Cancer Risk (lifetime risk per million)	56	34	97	43	90-95th	40	90-95th
NATA* Respiratory Hazard Index	2.2	1	97	2	60-70th	1.8	70-80th
Traffic Proximity and Volume (daily traffic count/distance to road)	6800	1000	96	1100	96	590	98
Lead Paint Indicator (% Pre-1960 Housing)	0.089	0.16	45	0.24	44	0.29	35
Superfund Proximity (site count/km distance)	0.061	0.1	55	0.15	44	0.13	50
RMP Proximity (facility count/km distance)	0.76	0.39	86	0.98	62	0.73	70
Hazardous Waste Proximity (facility count/km distance)	0.095	0.1	71	0.12	64	0.093	72
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0	0.04	N/A	13	59	30	40
Demographic Indicators							
Demographic Index	54%	51%	58	47%	61	36%	76
Minority Population	80%	77%	43	59%	69	38%	84
Low Income Population	28%	26%	60	36%	43	34%	45
Linguistically Isolated Population	18%	6%	91	9%	82	5%	91
Population With Less Than High School Education	12%	9%	74	17%	47	13%	56
Population Under 5 years of age	5%	6%	34	7%	34	6%	36
Population over 64 years of age	21%	16%	76	13%	85	14%	82

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

June 4, 2018

KIRK CALDWELL, MAYOR

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KAY C. MATSUI
RAY C. SOON

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ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer

Mr. Dalton Beauprez
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Beauprez:

Subject: Your Email Dated May 17, 2018 Requesting Comments on the Draft Environmental Assessment for the Proposed Ililani Tower Workforce Housing on Keawe Street and Halekauwila Street – Tax Map Key: 2-1-051: 011, 012

Thank you for the opportunity to comment on the proposed 328-unit mixed-use development.

The existing water system is adequate to accommodate the proposed 328-residential unit commercial mixed-use development. However, please be advised that this information is based upon current data, and therefore, the Board of Water Supply reserves the right to change any position or information stated herein up until the final approval of the building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission, and daily storage.

The developer should separately meter the different uses in the proposed development.

For the request for deferral of Water System Facilities Charges until the certificate of occupancy is obtained pursuant to Section 201-H, HRS, please coordinate with Garon Hamasaki, Service Engineering Section of our Customer Care Division at 748-5472, for further evaluation.

Water conservation measures are required for all proposed developments. These measures include utilization of nonpotable water for irrigation using rain catchment, drought tolerant plants, xeriscape landscaping, efficient irrigation systems, such as drip system and moisture sensors, and the use of Water Sense labeled ultra-low-flow water fixtures and toilets.

High-rise buildings with booster pumps will be required to install water hammer arrestors or expansion tanks to reduce pressure spikes and potential main breaks in our water system.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Robert Chun, Head of the Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

cc: R. Chun
No Log #

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

July 9, 2018

KIRK CALDWELL, MAYOR

BRYAN P. ANDAYA, Chair
KAPUA SPROAT, Vice Chair
DAVID C. HULIHEE
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ROSS S. SASAMURA, Ex-Officio
JADE T. BUTAY, Ex-Officio

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer

Mr. Dalton Beauprez, Planner
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

RECEIVED
JUL 10 2018
WILSON OKAMOTO CORPORATION

DB

Dear Mr. Beauprez:

Subject: Deferral Request for the Proposed Ililani Project

Thank you for your letter dated June 26, 2018, regarding the proposed Ililani project. The Board of Water Supply will grant the deferral of the water system facilities charges until the certificate of occupancy is issued. A Deferral Agreement will be executed during the Building Permit Application process.

If you have any questions, please call Garon Hamasaki of our Service Engineering Section, at 748-5460.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

David Y. Ige
Governor

John Whalen
Chairperson

Garett H. Kamemoto
Interim Executive Director

547 Queen Street
Honolulu, Hawaii
96813

Telephone
(808) 594-0300

Facsimile
(808) 587-0299

E-Mail
contact@hcdaweb.org

Website
www.hcdaweb.org

June 14, 2018

Mr. Keola Cheng
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

Mr. Cheng:

Re: Draft Environmental Assessment Consultation for the Ililani Mixed-Use Project at Tax Map Keys (TMK): [1] 2-1-051:011 and 012

The Hawaii Community Development Authority (HCDA) received your request to review and comment on the Draft Environmental Assessment (Draft EA) for the proposed Ililani mixed-use project (Project). The HCDA supports the affordable housing component of the Project and the selection of a site adjacent to the proposed Civic Center light rail station. Along with our support for the Project to provide more transit-ready affordable units in Kakaako, HCDA offers the following comments for your consideration:

1. We acknowledge that the Project may utilize the Hawaii Revised Statute (HRS), §201H-38 provision granted to affordable housing projects allowing the Project's developer to request exemptions from the requirements of the HRS Chapter 15-217 Mauka Area Rules (Mauka Area Rules) that HCDA administers.

   However, we request that you revise the Draft EA's Table 8-1 exemptions to only address specific provisions of the Mauka Area Rules and remove reference to non-relevant or broad rule citations that are not specific to your intended exemptions. For example, the Draft EA's exemption request No. 2, "Maximum Height – Parking Structure" references Mauka Area Rule provisions §15-217-23(a)(6) and §15-217-23(b). These two provisions establish the Pauahi Neighborhood Zone and the neighborhood's associated development standards, which are broad development standards and address more than building height restrictions. The HCDA does not support a blanket Project exemption from all the requirements set forth on the Pauahi Neighborhood Zone and, therefore, requests that you amend Table 8-1 and any other applicable section of the Draft EA to only list specific provisions.

2. After reviewing the Draft EA and the additional drawings provided by the Project's developer, it is HCDA's understanding that the Project will require exemptions from the following Kakaako rules administered by HCDA:

   a. HRS. Ch. 15-218 Kakaako Reserved Housing Rules, which will exempt the Project from needing to provide reserved housing units;

   b. *Street Front Element Height Range* as established in Figures 1.3(D) and Figure NZ.6(D) of the Mauka Area Rules, which will allow the street front element height to exceed the 65' limit;

   c. *Maximum density (floor area ratio)* as established in Figures NZ.6(D) of the Mauka Area Rules, which will allow the Project's developer to increase the Project's FAR from 3.5 to 8.8;

   d. Mauka Area Rules §15-217-65 *Public Facility Dedication Fee*, which will exempt the Project from having a public facility dedication fee;

   e. Mauka Area Rules §15-217-63(c)(3) *Curb Cuts*, which will allow the Project to have curb cuts closer than twenty-two feet from adjacent properties;

   f. Mauka Area Rules §15-217-59 *Green Building*, which will exempt the Project from needing to achieve the base LEED certification or LEED equivalent;

   g. *Minimum Vertical Clearance for Balcony Front Yard Encroachments* as defined in Figure 1.13-C of the Mauka Area Rules, which will allow balconies for the Project to only have a minimum vertical clearance of 15 feet above the sidewalk;

   h. *Frontage Occupancy at Build to Line* as established in Figure 1.3(C) and Figure NZ.6(C), which will allow the Project's Halekauwila Street frontage to be less than the 60 percent occupancy requirement;

   i. Mauka Area Rules §15-217-56(d), which will exempt the Project from needing to provide fifty-five square feet of recreation space per dwelling unit;

   j. *Parking Placement Zone* as established in Figure 1.10 of the Mauka Area Rules, which will allow the Project to provide one parking stall, designated only for generator fuel delivery, within the forty-foot parking setback; and

   k. Mauka Area Rules §15-217-55(l)(4), which will allow the Project's tower to be located less than 300 feet from any existing adjacent tower's "mauka-makai zone". This exemption was not listed in the Draft EA's Table 8-1, but would be necessary with the proposed design.

3. The Draft EA includes Mauka Area Rule exemptions from the off-street parking quantity requirement; however, based on the proposed design if the Project utilizes the shared parking provision, then the off-street parking quantity requirement can be met and will not require this exemption.

4. We acknowledge and do not oppose the green building exemption (exemption f, above), however, we request that the Project pursue most of the credits necessary to achieve LEED's base certification or an approved equivalent green building certification. We also request that the Project's developer provide HCDA with the verification documents and sustainability calculations demonstrating compliance with the green building credits the Project intends to achieve.

Thank you for the opportunity to review and provide comments on this Draft EA and if you have questions regarding this matter, please contact Mr. Carson Schultz, AIA at 594-0333.

Sincerely,

Garett H. Kamemoto
Interim Executive Director

APPENDIX C:

Pedestrian Wind Consultation Study

DRAFT REPORT

ILILANI TOWER

HONOLULU, HAWAII

PEDESTRIAN WIND CONSULTATION
RWDI #1702225
December 22, 2017

SUBMITTED TO
Henry Chang, PM
changh11@yahoo.com

Ililani LLC
1860 Ala Moana Boulevard
Suite #1000
Honolulu, Hawaii 96815
T: 808.277.1412

SUBMITTED BY
William Schinkel, P.Eng.
Project Engineer
William.Schinkel@rwdi.com

Kelly Baah, M.Eng., EIT
Technical Coordinator
Kelly.Baah@rwdi.com

Analene Belanger, P.Eng., PMP
Senior Project Manager / Principal
Analene.Belanger@rwdi.com

Rowan Williams Davies & Irwin Inc.
600 Southgate Drive
Guelph, Ontario N1G 4P6
T: 519.823.1311
F: 519.823.1316

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EXECUTIVE SUMMARY

The wind conditions for the proposed Ililani Tower in Honolulu, Hawaii are discussed in detail within the content of this report and may be summarized as follows below.

This tower was originally tested by RWDI in May 2017 and a report was issued on June 7, 2017 (RWDI # 1702225). Since then, the geometry of the tower was revised, which has an impact on the project's aerodynamic performance. This report reflects the wind tunnel testing of the updated design of the building. The results provided herein supersede those presented previously.

- Wind speeds at all grade and above-grade level locations are predicted to pass the criterion used to assess pedestrian wind safety in both the existing and proposed test configurations.
- In the existing condition, without the presence of Ililani Tower, appropriate wind speeds exist at most grade level areas of the site. Slightly uncomfortable conditions exist at the junction of Queen Street and Keawe Street.
- With the addition of the proposed Ililani Tower, appropriate wind comfort conditions are expected at most grade level locations. Marginally uncomfortable wind speeds are predicted at along Keawe Street near the proposed development (similar to what is currently experienced at the junction of Queen Street and Keawe Street).
- Wind conditions on the south areas of the podium are expected to be comfortable for standing throughout the year, which is considered appropriate. The wind speeds at the north areas of the podium are predicted to be higher, and are predicted to be comfortable for strolling and walking.

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PEDESTRIAN WIND CONSULTATION
ILILANI TOWER
RWDI #1702225
December 22, 2017

LIST OF FIGURES

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Figure 4a: Pedestrian Wind Comfort Conditions – Existing Configuration – Winter
Figure 4b: Pedestrian Wind Comfort Conditions – Proposed Configuration – Winter
Figure 5a: Pedestrian Wind Safety Conditions – Existing Configuration – Annual
Figure 5b: Pedestrian Wind Safety Conditions – Proposed Configuration – Annual

LIST OF TABLES

Table 1: Pedestrian Wind Comfort and Safety Conditions

LIST OF APPENDICES

Appendix A: List of Drawings for Construction

1 INTRODUCTION

Rowan Williams Davies & Irwin Inc. (RWDI) was retained by Ililani LLC to consult on the pedestrian wind conditions for the proposed Ililani Tower in Honolulu, Hawaii. The purpose of the study was to assess the wind environment around the development in terms of pedestrian wind comfort and safety. This objective was achieved through wind tunnel testing of a 1:400 scale model of the proposed building for the following configurations:

Configuration A – Existing: existing surroundings without the proposed Ililani Tower; and,

Configuration B – Proposed: existing surroundings with the proposed Ililani Tower.

The photographs in Figures 1a and 1b show the test model in RWDI's boundary-layer wind tunnel. The proposed development consists of a 42-story tower (approximately 367 ft. tall) and an outdoor recreation deck on Level 9. The test model was constructed using the design information and drawings listed in Appendix A. This report summarizes the methodology of wind tunnel studies for pedestrian wind conditions, describes the RWDI pedestrian wind comfort and safety criteria, presents the local wind conditions and their effects on pedestrians and provides conceptual wind control measures, where necessary.

2 METHODOLOGY

As shown in Figures 1a and 1b, the wind tunnel model included the proposed development and all relevant surrounding buildings and topography within a 1600 ft. radius of the study site. The boundary-layer wind conditions beyond the modeled area were also simulated in RWDI's wind tunnel. The model was instrumented with 40 wind speed sensors to measure mean and gust wind speeds at a full-scale height of approximately 5 ft. These measurements were recorded for 36 equally incremented wind directions.

Wind statistics recorded at Honolulu International Airport between 1985 and 2016 were analyzed for the Summer (May through October) and Winter (November through April) seasons. Figure 2 graphically depicts the directional distributions of wind frequencies and speeds for the two seasons. Winds from the northeast direction are predominant in both the summer and winter as indicated by the wind roses. Strong winds of a mean speed greater than 20 mph measured at the airport (at an anemometer height of 30 ft.) occur more often in the winter (3.5%) than in the summer (2.7%).

Wind statistics from Honolulu International Airport were combined with the wind tunnel data in order to predict the frequency of occurrence of full-scale wind speeds. The full-scale wind predictions were then compared with the RWDI criteria for pedestrian comfort and safety.

3 WIND CRITERIA

The RWDI pedestrian wind criteria are used in the current study. These criteria have been developed by RWDI through research and consulting practice since 1974 (References 1 through 6). They have also been widely accepted by municipal authorities as well as by the building design and city planning community.

RWDI Pedestrian Wind Criteria

Wind Category	GEM Speed (mph)	Description
Sitting	≤ 6	Calm or light breezes desired for outdoor restaurants and seating areas where one can read a paper without having it blown away
Standing	≤ 8	Gentle breezes suitable for main building entrances, bus stops and other places where pedestrians may linger
Strolling	≤ 10	Moderate winds that would be appropriate for window shopping and strolling along a downtown street, plaza or park
Walking	≤ 12	Relatively high speeds that can be tolerated if one's objective is to walk, run or cycle without lingering
Uncomfortable	> 12	Strong winds of this magnitude are considered a nuisance for most activities, and wind mitigation is typically recommended

Notes: (1) Gust Equivalent Mean (GEM) Speed = max(mean speed, gust speed / 1.85); and;
(2) GEM speeds listed above based on a seasonal exceedance of 20% of the time between 6:00 and 23:00.

Safety Criterion	GEM Speed (mph)	Description
Exceeded	> 56	Excessive gust speeds that can adversely affect a pedestrian's balance and footing. Wind mitigation is typically required.

Notes: Based on an annual exceedance of 9 hours or 0.1% of the time for 24 hours a day.

A few additional comments are provided below to further explain the wind criteria and their applications.

- Both mean and gust speeds can affect pedestrian comfort and their combined effect is typically quantified by a Gust Equivalent Mean (GEM) speed, with a gust factor of 1.85 (References 1, 5, 7 and 8).
- Nightly hours between midnight and 5 o'clock in the morning are excluded from the wind analysis for wind comfort since limited usage of outdoor spaces is anticipated.
- A 20% exceedance is used in these criteria to determine the comfort category, which suggests that wind speeds would be comfortable for the corresponding activity at least 80% of the time or four out of five days.

- Only gust winds need to be considered in the wind safety criterion. These are usually rare events, but deserve special attention in city planning and building design due to their potential safety impact on pedestrians.

- These criteria for wind forces represent average wind tolerance. They are sometimes subjective and regional differences in wind climate and thermal conditions as well as variations in age, health, clothing, etc. can also affect people's perception of the wind climate. Comparisons of wind speeds for different building configurations are the most objective way in assessing local pedestrian wind conditions.

4 PREDICTED WIND CONDITIONS

The predicted wind comfort and safety conditions for the existing and proposed configurations are graphically depicted on a site plan in Figures 3a through 4b. These conditions and the associated wind speeds are presented in Table 1, located in the Tables section of this report.

The wind safety criterion was met at all locations in both the existing and proposed test configurations (Figures 5a and 5b). The following is a detailed discussion of the suitability of the predicted wind comfort conditions for the anticipated pedestrian use of each area.

4.1 Grade Level (Locations 1 to 33)

Wind conditions comfortable for walking or strolling are appropriate for sidewalks. Lower wind speeds conducive to standing are preferred at main entrances where pedestrians are apt to linger.

In the existing configuration, appropriate wind comfort conditions generally exist at the surrounding sidewalks on and around the site throughout the year (Figures 3a and 4a). Localized areas with uncomfortable conditions exist at the junction of Queen Street and Keawe Street, throughout the year (Locations 8 and 10 in Figures 3a and 4a).

With the addition of the proposed Ililani Tower, wind conditions at most sidewalk locations are expected to remain comfortable for walking or better throughout the year, which is considered appropriate (Figures 3b and 4b). However, marginally uncomfortable wind speeds (1 to 2 mph above the threshold) are expected on the north side of Keawe Street, between 20-30% of the time throughout the year and on the south side of Keawe Street for 25% of the time in the summer (Location 5 in Figure 3b and Location 13 in Figures 3b and 4b). It is important to note that wind speeds within the recessed entrance near Location 5 will be lower, and that wind speeds at both locations are expected to be comfortable for walking 70-80% of time throughout the year. The conditions at Location 13 are also comparable to the existing wind conditions at the junction of Queen Street and Keawe Street, where borderline uncomfortable conditions currently exist and are expected to remain with the addition of the proposed building. Furthermore, any future planned landscaping elements such as planters or street trees along Keawe Street are expected to improve the wind comfort conditions.

4.2 Above-Grade Level (Locations 34 to 40)

It is generally desirable for wind conditions on an outdoor recreation deck intended for passive activities to be comfortable for sitting more than 80% of the time. However, in relatively warm climates such as Honolulu, standing conditions may be acceptable as a light breeze if often considered pleasant.

Wind conditions on the south areas of the recreation deck at Level 9 are predicted to be comfortable for standing throughout the year (Locations 36, 39 and 40 in Figure 3b and 4b), which is considered appropriate. Wind speeds at the north areas of the recreation deck are predicted to be comfortable for strolling or walking throughout the year (Locations 34, 35, 37 and 38 in Figures 3b and 4b). Walking or strolling wind speeds are higher than desired for passive activities. Pedestrians will have the option to relocate to calmer areas of the recreation deck on windy days, and landscaping elements can also be used to provide wind mitigation.

5 APPLICABILITY

The wind conditions presented in this report pertain to the proposed Ililani Tower in Honolulu, Hawaii as detailed in the architectural design drawings listed in Appendix A. Should there be any design changes that deviate from this list of drawings, the wind condition predictions presented may change. Therefore, if changes in the design are made, it is recommended that RWDI be contacted and requested to review their potential effects on wind conditions.

6 REFERENCES

1. ASCE Task Committee on Outdoor Human Comfort (2004). *Outdoor Human Comfort and Its Assessment*, 68 pages, American Society of Civil Engineers, Reston, Virginia, USA.

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7. Lawson, T.V. (1973). "Wind Environment of Buildings: A Logical Approach to the Establishment of Criteria", *Report No. TVL 7321*, Department of Aeronautic Engineering, University of Bristol, Bristol, England.

8. Durgin, F. H. (1997). "Pedestrian Level Wind Criteria Using the Equivalent average", *Journal of Wind Engineering and Industrial Aerodynamics*, Vol. 66, pp. 215-226.

FIGURES

Wind Tunnel Study Model
Existing Configuration

Ililani Tower – Honolulu, HI

Project #1702225

Figure No. 1a

Date: May 12, 2017

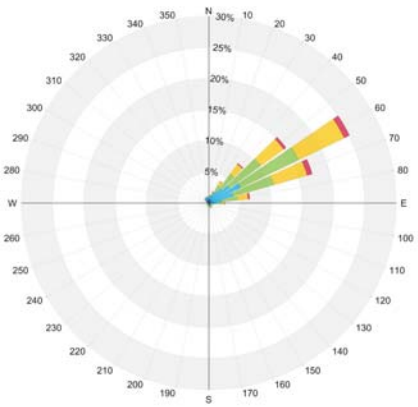
Wind Tunnel Study Model
Proposed Configuration

Ililani Tower – Honolulu, HI

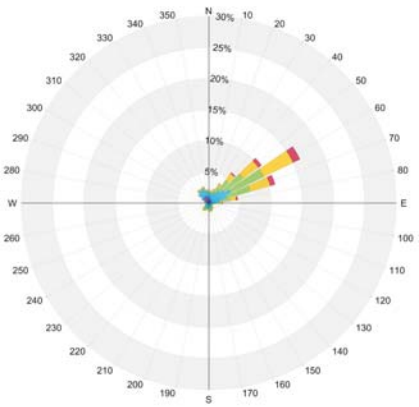
Project #1702225

Figure No. 1b

Date: December 12, 2017



Summer
(May - October)



Winter
(November - April)

Wind Speed (mph)	Probability (%) Summer	Winter
Calm	3.5	7.0
1-5	9.0	15.0
6-10	27.0	31.1
11-15	34.3	26.5
16-20	23.5	16.9
>20	2.7	3.5

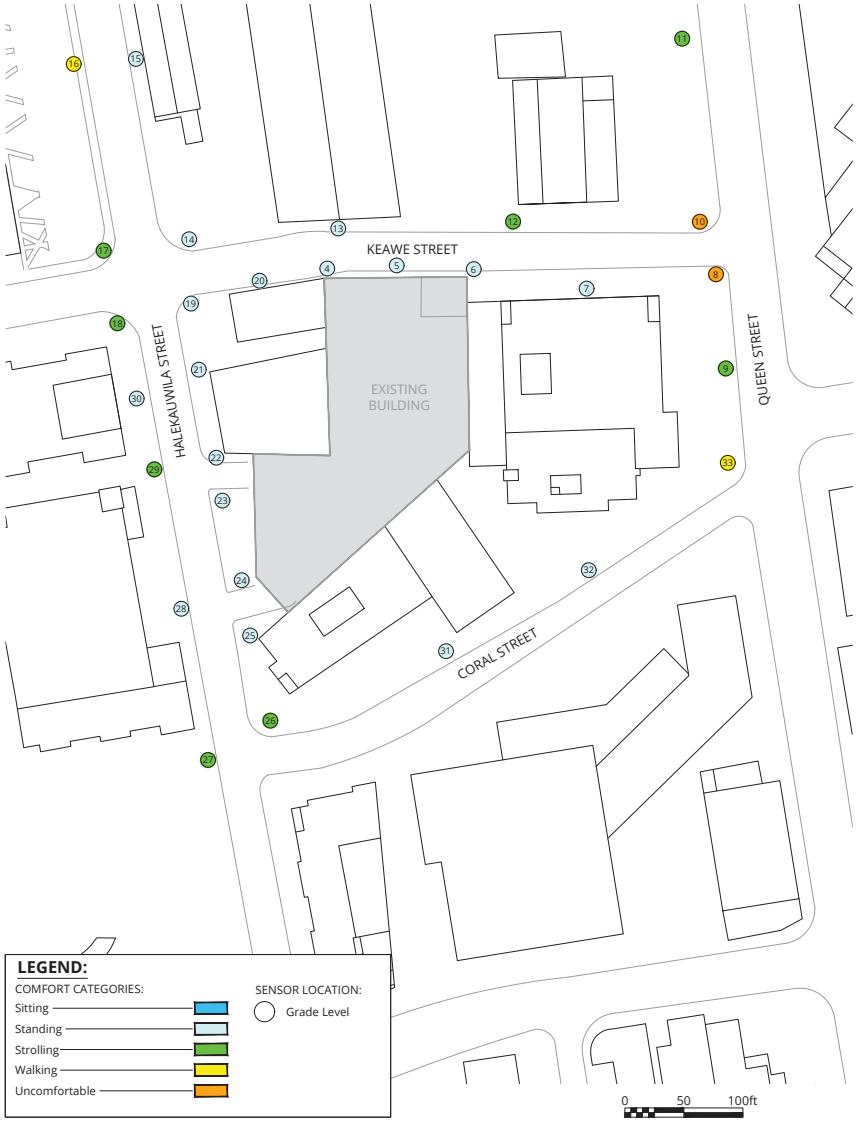
Directional Distribution (%) of Winds (Blowing From)
Honolulu International Airport (1985 - 2016)

Ililani Tower – Honolulu, HI

Project #1702225

Figure No. 2

Date: May 12, 2017



Pedestrian Wind Comfort Conditions
Existing Configuration
Summer (May to October, 6:00 to 23:00)

True North

Drawn by: ck

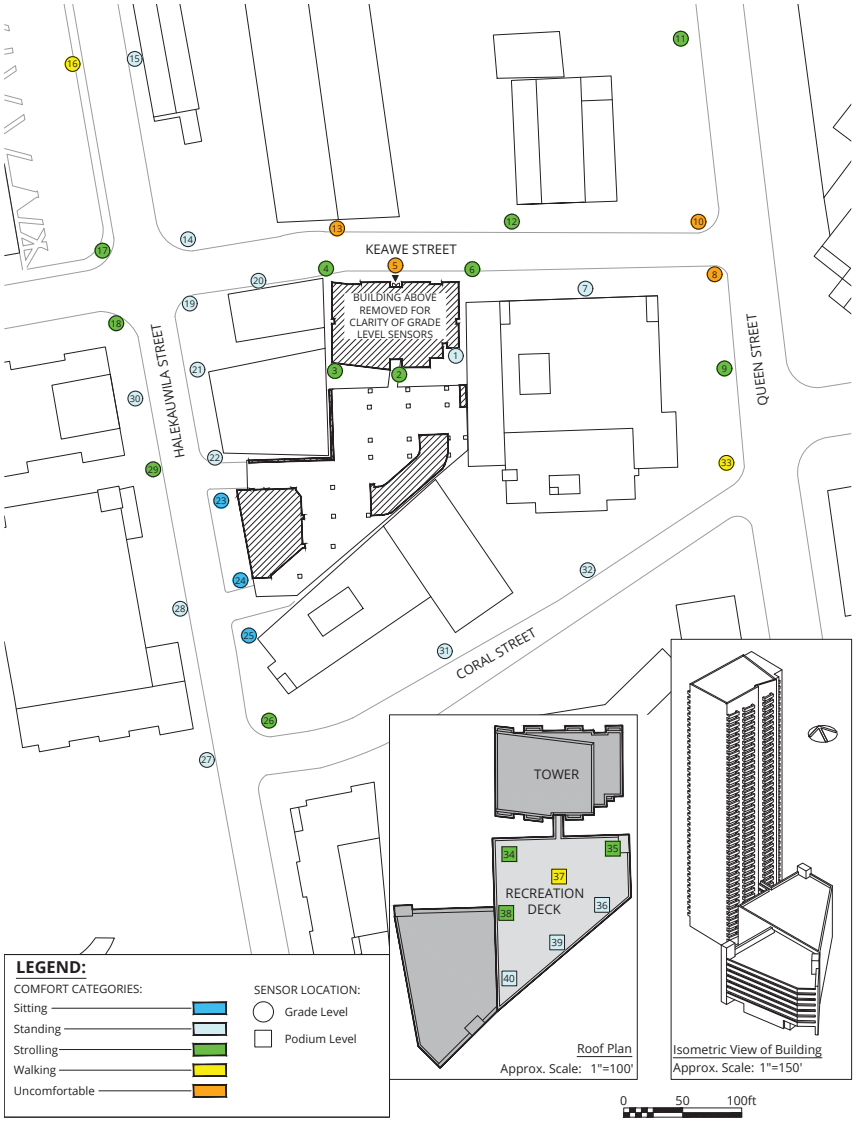
Figure: 3a

Approx. Scale: 1"=100'

Date Revised: May 25, 2017

Ililani Tower - Honolulu, HI

Project #1702225

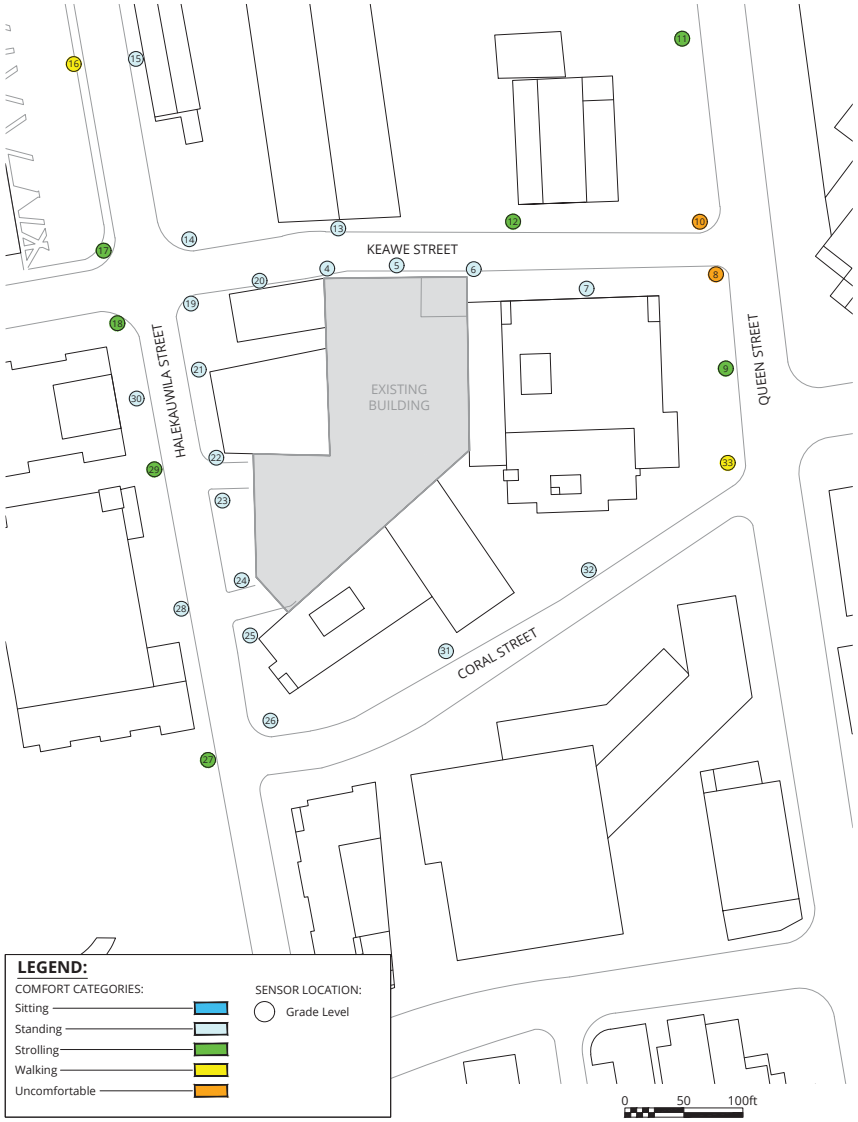


Pedestrian Wind Comfort Conditions
Proposed Configuration
Summer (May to October, 6:00 to 23:00)

True North

Drawn by: DBB	Figure: 3b		
Approx. Scale: 1"=100'			
Date Revised: Dec. 8, 2017			

Ililani Tower - Honolulu, HI
Project #1702225

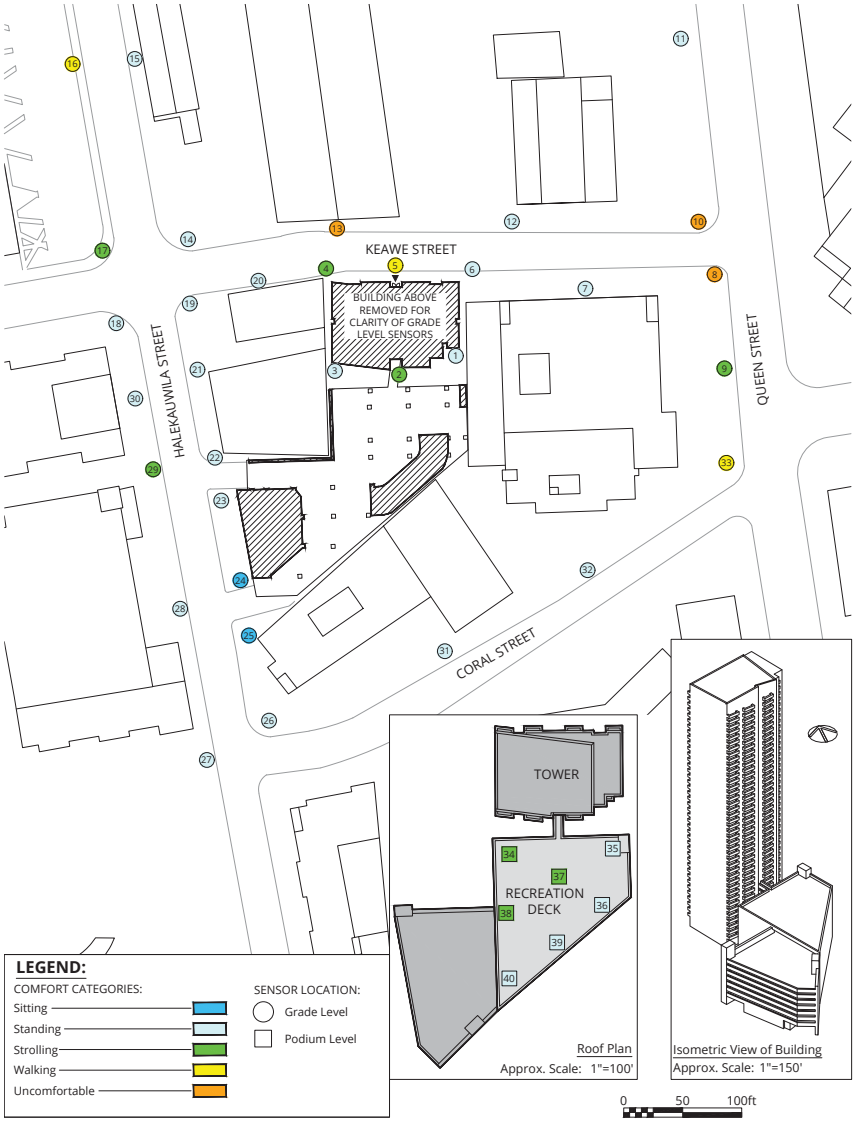


Pedestrian Wind Comfort Conditions
Existing Configuration
Winter (November to April, 6:00 to 23:00)

True North

Drawn by: ck	Figure: 4a		
Approx. Scale: 1"=100'			
Date Revised: May 25, 2017			

Ililani Tower - Honolulu, HI
Project #1702225

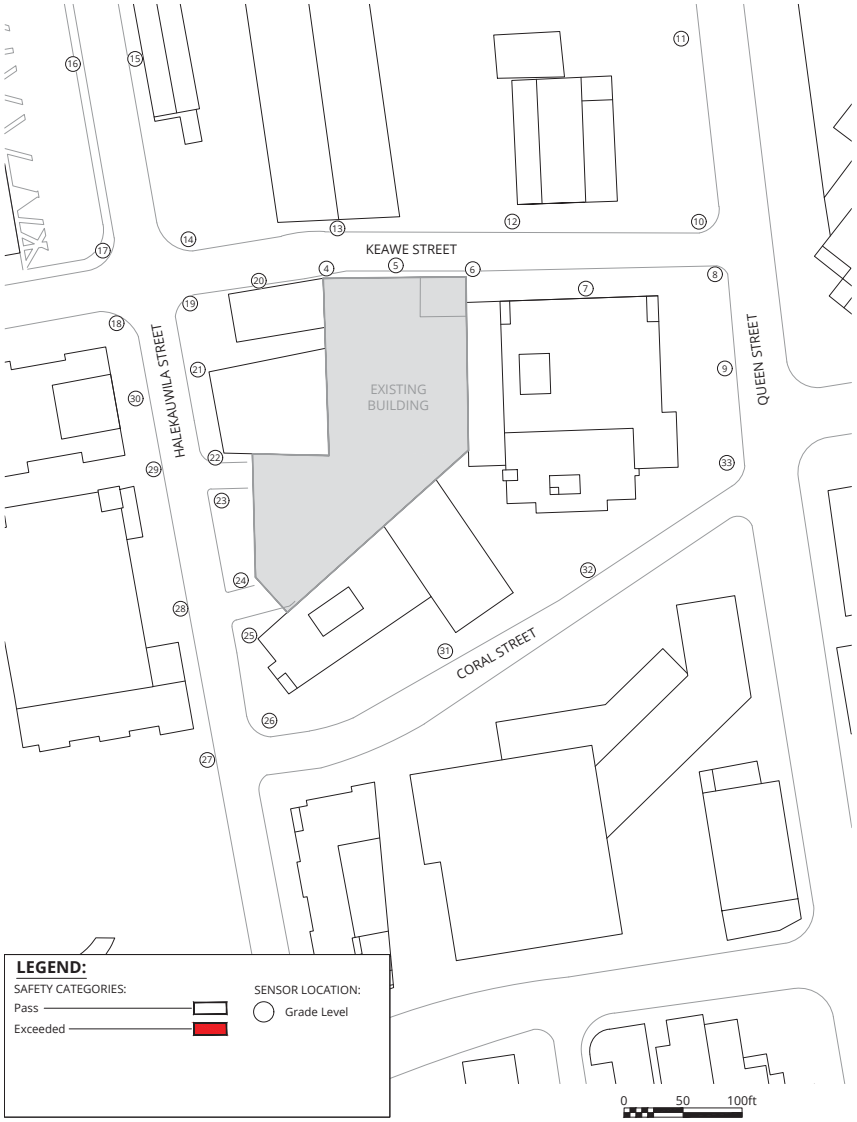


Pedestrian Wind Comfort Conditions
Proposed Configuration
Winter (November to April, 6:00 to 23:00)

True North

Drawn by: DBB | Figure: 4b
Approx. Scale: 1"=100'
Date Revised: Dec. 8, 2017

Ililani Tower - Honolulu, HI
Project #1702225

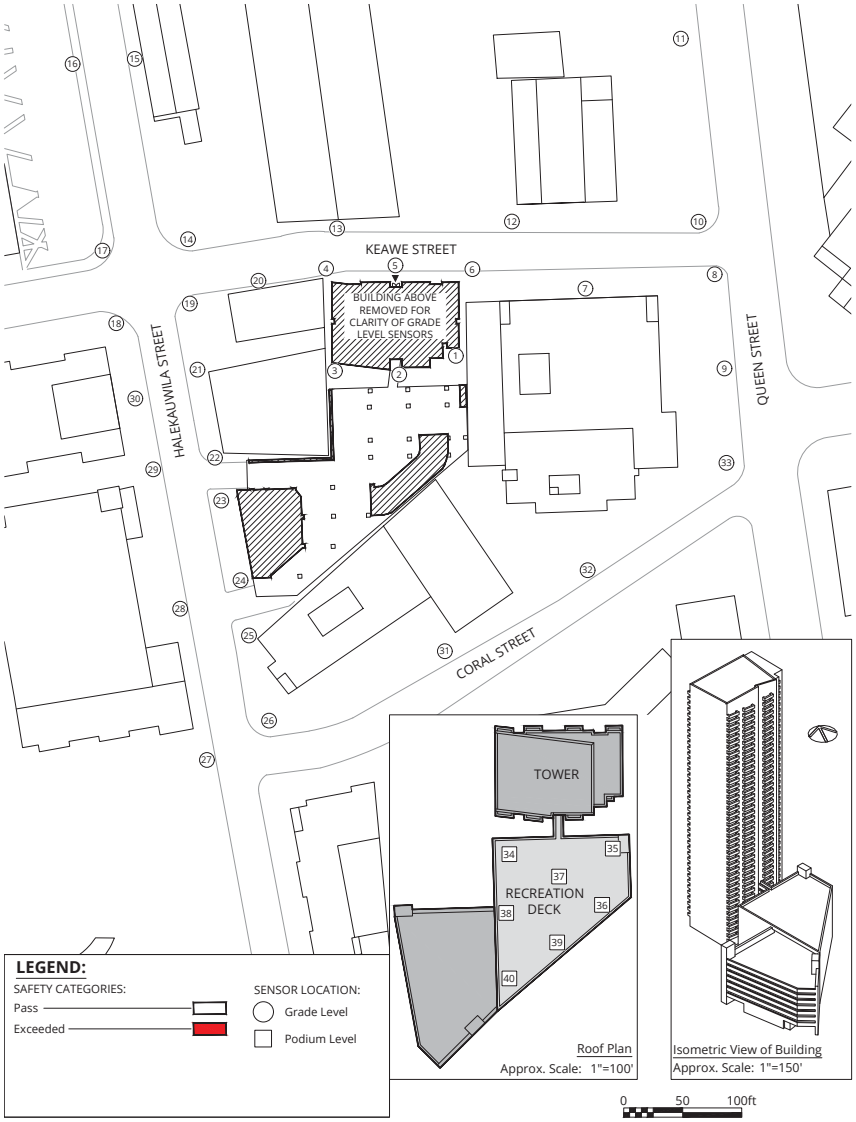


Pedestrian Wind Safety Conditions
Existing Configuration
Annual (January to December, 0:00 to 23:00)

True North

Drawn by: ck | Figure: 5a
Approx. Scale: 1"=100'
Date Revised: Dec. 22, 2017

Ililani Tower - Honolulu, HI
Project #1702225



Pedestrian Wind Safety Conditions
Proposed Configuration
Annual (January to December, 0:00 to 23:00)

Ililani Tower - Honolulu, HI

Project #1702225

True North

Drawn by: DBB	Figure: 5b
Approx. Scale:	1"=100'
Date Revised:	Dec. 22, 2017

TABLES

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (mph)	Rating	Speed (mph)	Rating	Speed (mph)	Rating
1	Existing	-	-	-	-	-	-
	Proposed	7	Standing	7	Standing	27	Pass
2	Existing	-	-	-	-	-	-
	Proposed	10	Strolling	10	Strolling	32	Pass
3	Existing	-	-	-	-	-	-
	Proposed	9	Strolling	8	Standing	28	Pass
4	Existing	8	Standing	8	Standing	28	Pass
	Proposed	10	Strolling	10	Strolling	34	Pass
5	Existing	8	Standing	8	Standing	26	Pass
	Proposed	13	Uncomfortable	12	Walking	40	Pass
6	Existing	8	Standing	8	Standing	26	Pass
	Proposed	9	Strolling	8	Standing	29	Pass
7	Existing	8	Standing	7	Standing	27	Pass
	Proposed	8	Standing	8	Standing	27	Pass
8	Existing	14	Uncomfortable	14	Uncomfortable	43	Pass
	Proposed	14	Uncomfortable	13	Uncomfortable	42	Pass
9	Existing	10	Strolling	10	Strolling	33	Pass
	Proposed	9	Strolling	9	Strolling	31	Pass
10	Existing	14	Uncomfortable	14	Uncomfortable	43	Pass
	Proposed	14	Uncomfortable	14	Uncomfortable	42	Pass
11	Existing	9	Strolling	9	Strolling	29	Pass
	Proposed	9	Strolling	8	Standing	29	Pass
12	Existing	10	Strolling	9	Strolling	32	Pass
	Proposed	9	Strolling	8	Standing	29	Pass
13	Existing	8	Standing	8	Standing	30	Pass
	Proposed	14	Uncomfortable	13	Uncomfortable	42	Pass
14	Existing	8	Standing	8	Standing	29	Pass
	Proposed	8	Standing	8	Standing	29	Pass
15	Existing	8	Standing	8	Standing	30	Pass
	Proposed	7	Standing	7	Standing	30	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (mph)	Rating	Speed (mph)	Rating	Speed (mph)	Rating
16	Existing	12	Walking	11	Walking	38	Pass
	Proposed	11	Walking	11	Walking	37	Pass
17	Existing	10	Strolling	10	Strolling	34	Pass
	Proposed	10	Strolling	10	Strolling	34	Pass
18	Existing	10	Strolling	10	Strolling	32	Pass
	Proposed	9	Strolling	8	Standing	30	Pass
19	Existing	7	Standing	8	Standing	29	Pass
	Proposed	8	Standing	8	Standing	29	Pass
20	Existing	7	Standing	7	Standing	25	Pass
	Proposed	8	Standing	8	Standing	32	Pass
21	Existing	7	Standing	8	Standing	29	Pass
	Proposed	8	Standing	8	Standing	31	Pass
22	Existing	7	Standing	7	Standing	27	Pass
	Proposed	7	Standing	8	Standing	31	Pass
23	Existing	7	Standing	7	Standing	27	Pass
	Proposed	6	Sitting	7	Standing	29	Pass
24	Existing	8	Standing	8	Standing	26	Pass
	Proposed	6	Sitting	6	Sitting	26	Pass
25	Existing	8	Standing	8	Standing	27	Pass
	Proposed	6	Sitting	6	Sitting	26	Pass
26	Existing	9	Strolling	8	Standing	29	Pass
	Proposed	9	Strolling	8	Standing	29	Pass
27	Existing	9	Strolling	9	Strolling	30	Pass
	Proposed	8	Standing	8	Standing	27	Pass
28	Existing	8	Standing	8	Standing	29	Pass
	Proposed	8	Standing	8	Standing	30	Pass
29	Existing	9	Strolling	9	Strolling	33	Pass
	Proposed	9	Strolling	9	Strolling	34	Pass
30	Existing	8	Standing	8	Standing	29	Pass
	Proposed	8	Standing	8	Standing	32	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (mph)	Rating	Speed (mph)	Rating	Speed (mph)	Rating
31	Existing	8	Standing	8	Standing	26	Pass
	Proposed	8	Standing	8	Standing	26	Pass
32	Existing	8	Standing	8	Standing	26	Pass
	Proposed	8	Standing	8	Standing	26	Pass
33	Existing	11	Walking	11	Walking	35	Pass
	Proposed	11	Walking	11	Walking	35	Pass
34	Existing	-	-	-	-	-	-
	Proposed	9	Strolling	9	Strolling	29	Pass
35	Existing	-	-	-	-	-	-
	Proposed	9	Strolling	8	Standing	28	Pass
36	Existing	-	-	-	-	-	-
	Proposed	8	Standing	8	Standing	27	Pass
37	Existing	-	-	-	-	-	-
	Proposed	11	Walking	10	Strolling	34	Pass
38	Existing	-	-	-	-	-	-
	Proposed	10	Strolling	10	Strolling	32	Pass
39	Existing	-	-	-	-	-	-
	Proposed	8	Standing	8	Standing	29	Pass
40	Existing	-	-	-	-	-	-
	Proposed	7	Standing	7	Standing	29	Pass

Seasons	Hours
Summer = May - October	6:00 - 23:00 for comfort
Winter = November - April	0:00 - 23:00 for safety

Configurations	
Existing	Without the proposed development
Proposed	With the proposed development

Comfort Speed (mph)	
(20% Seasonal Exceedance)	
≤ 6	Sitting
7 - 8	Standing
9 - 10	Strolling
11 - 12	Walking
> 12	Uncomfortable

Safety Speed (mph)	
(0.1% Annual Exceedance)	
≤ 56	Pass
> 56	Exceeded

APPENDIX A

Drawing List for Model Construction

The drawings and information listed below were received from Ililani LLC and were used to construct the scale model of the proposed Ililani Tower in Honolulu, HI. Should there be any design changes that deviate from this list of drawings, the results may change. Therefore, if changes in the design are made, it is recommended that RWDI be contacted and requested to review their potential effects on wind conditions.

File Name	File Type	Date Received (dd/mm/yyyy)
Ililani - Elevations - Tower and Parking 14A	PDF	08/11/2017
Ililani - Elevations - Tower and Parking 14	PDF	08/11/2017
Ililani - Elevations - Tower and Parking 13	PDF	08/11/2017
ILILANI - DD - Tower 2nd non-ADA shear & Otis adjusted	PDF	07/11/2017
ILILANI - DD - Ground Parking Oct 19 2017	PDF	07/11/2017
ILILANI - DD - Mezz Parking Oct 19 2017	PDF	07/11/2017
ILILANI - DD - Overall Floor Plan - Work - GARRETT Parking	DWG	07/11/2017
ILILANI - DD - Parking Oct 19 2017	PDF	07/11/2017
ILILANI - DD - Rec Deck Level 9 over Parking level 8 Oct 19 2017	PDF	07/11/2017
ILILANI - DD - Tower 1st shear & Otis adjusted	PDF	07/11/2017
ILILANI - DD - Tower 2nd ADA shear & Otis adjusted	PDF	07/11/2017
ILILANI - DD - Tower 2nd non-ADA shear & Otis adjusted	PDF	07/11/2017
ILILANI - DD - Tower Floor Plan - A101 - HENRY Shear & Otis edited Oct 19	DWG	07/11/2017
ILILANI - DD - Tower Floor Plan - A102 - HENRY ADAAG Shear & Otis edited Oct 19	DWG	07/11/2017
ILILANI - DD - Tower Floor Plan - A102 - HENRY Shear & Otis edited Oct 19	DWG	07/11/2017
ILILANI - DD - Overall Floor Plan - Work - GARRETT Parking	DWG	23/10/2017
ILILANI - DD - Parking Oct 19 2017	PDF	23/10/2017
ILILANI - DD - Rec Deck Level 9 over Parking level 8 Oct 19 2017	PDF	23/10/2017
ILILANI - DD - Tower Floor Plan - A101 - HENRY Shear & Otis edited Oct 19	DWG	23/10/2017
ILILANI - DD - Tower Floor Plan - A104 - HENRY Shear & Otis edited Oct 19	DWG	23/10/2017
ILILANI - DD - Tower Floor Plan - A105 Roof - HENRY Shear & Otis edited Oct 19	DWG	23/10/2017

APPENDIX D:

Environmental Hazard Evaluation &
Environmenal Hazard Management Plan

MASA FUJIOKA & ASSOCIATES
Environmental • Geotechnical • Hydrogeological Consultants
98-021 Kamehameha Highway, Suite 337 • Aiea, Hawaii 96701-4914
Telephone: (808) 484-5366 • Facsimile: (808) 484-0007

Environmental Hazard Evaluation (EHE) and Environmental Hazard Management Plan (EHMP) Ililani LLC 690 Halekauwila Street TMK: (1) 2-1-051:011 and 615 Keawe Street, TMK: (1) 2-1-051:012 Honolulu, O‘ahu, Hawai‘i

Prepared for:

Ililani LLC
1860 Ala Moana Blvd., #1000
Honolulu, HI 96817

Prepared by:
Masa Fujioka & Associates
98-021 Kamehameha Highway, Suite 337
Aiea, HI 96701

Revised July 10, 2018
Version2: FINAL
MFA Project number 18685-005

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1.0 INTRODUCTION AND PURPOSE

This report supersedes the Wong's Produce Environmental Hazard Evaluation (EHE) and Environmental Hazard Management Plan (EHMP) dated March 2018. The subject site is revised to include two properties as designated by TMK: (1) 2-1-051:011 and TMK: (1) 2-1-051:012 (Figure 1). The subject site includes the entire project area as proposed for development by Ililani, LLC as residential, affordable housing. Results of a recent Site Investigation at Wongs Produce 690 Halekauwila Street (MFA June 2018) have been added to the EHE and even though no known contamination exists on the subject property at 615 Keawe Street TMK (1) 2-1-051:012 the area is included in the EHMP.

As part of standard sampling during closure of a 550-gallon underground storage tank (UST) at the former Wong's Produce site, 690 Halekauwila Street, Honolulu, total lead was found in subsurface soil in concentrations exceeding State of Hawai'i Department of Health (HDOH) Environmental Action Levels (for unrestricted land use, not located over a drinking water source, and greater than 150 meters from an open water body). The 550-gallon UST was one of two USTs removed from the ground and closed in accordance with HDOH guidelines, as detailed in the tank closure report *Underground Storage Tank Closure, 2,500-Gallon Underground Heating Oil Storage Tank and, 550-Gallon Underground Gasoline Storage Tank, (former) Wong's Produce, 690 Halekauwila Street, Honolulu, Hawaii 96813* (MFA, January 2018).

The two USTs at the site were previously unknown and not identified on the HDOH Solid & Hazardous Waste Branch (SHWB) UST list. The tanks were discovered during site work, as the site is planned for demolition and subsequent development. Tank closure and soil sampling activities were conducted from December 15 to 19, 2017. One multi-incremental (MI) soil sample was collected from each of the UST excavations (two total MI soil samples) for laboratory analysis of total petroleum hydrocarbons (full fuel scan), volatile organic compounds (VOCs) and semi-volatile organic compounds, and RCRA 8 metals (2500-gallon tank only) or Total Lead (500-gallon tank only, per HDOH guidelines). The laboratory results were "not detected" (ND) at or above the laboratory reporting limits for all of the analyses except for total metals. The sample from the 550-gallon gasoline UST excavation indicated a lead concentration of 1300 mg/kg, exceeding the HDOH Environmental Action Level (EAL) of 200 mg/kg. Four metals,(including lead at 150mg/kg) were detected in the soil sample from the 2500-gallon UST, but none exceeded its EAL.

Upon review of the UST Closure Report, the HDOH SHWB recommended groundwater investigation and additional soil sampling to determine the extent of the lead contamination. Further investigation of the site was conducted in April and June 2018 in an attempt to delineate the extent of the lead contamination, but the investigation was limited due to site buildings, neighboring structures, and Halekauwila Street and the public (offsite) sidewalk. The site investigation included groundwater sampling and additional soil sampling in the buildings'

loading dock. The site investigation report was submitted to the HDOH SHWB for review in June 2018. The results of the site investigation report indicate the lead contamination at the site did not result from a release of the UST. Based on the results of the site investigation of the UST, we have revised the EHE-EHMP to.

This combined Environmental Hazard Evaluation (EHE) and Environmental Hazard Management Plan (EHMP) documents potential hazards present at the facility based on the concentrations of contaminants found during recent sampling (December 2017 to June 2018); to identify activities that could cause exposure to contaminants; to document the controls in place to prevent exposure to the contamination; and to document the plan to follow if pathways to exposure are established or anticipated to be established. This EHE-EHMP includes construction-related plans for handling contamination during subsurface construction activities that could expose construction workers, nearby people, or ecological receptors. This EHE-EHMP includes plans to manage long-term subsurface lead contamination, if any are left in place after construction, in order to prevent future exposure.

We request that upon acceptance of this document, HDOH issue a 'no further action' status for the subject HDOH Release Facility ID 9-103972, Release ID 180013 at the former Wongs Produce at 690 Halekauwila Street, Honolulu, HI.

1.1 REGULATORY FRAMEWORK

Under state laws and regulations, the site owner (Owner) is ultimately responsible for proper handling of contaminated materials and environmental media, reporting releases where encountered, preventing migration of existing contamination, and ensuring compliance with the law. The Owner is also responsible for training of contractors and subcontractors on the requirements presented in this EHE-EHMP. This EHE-EHMP is not intended to address chemicals and hazards introduced by contractors during the course of their work. Additional environmental hazards not identified in this plan may exist. During construction, each contractor remains responsible for protecting the environment and the health and safety of its employees, workers, and the general public. Before construction, the contractors should review applicable regulations and guidance from the Occupational Safety and Health Administration (OSHA), U.S. Environmental Protection Agency (USEPA), and State of Hawai'i Department of Health (HDOH). This EHE-EHMP is not intended to identify all agencies and environmental statutes and regulations that may be required during construction, but instead focuses on the relevant requirements for managing contamination encountered in the field.

1.2 DOCUMENT ORGANIZATION

Following Section 1, this EHE-EHMP is organized as follows:
Section 2, Project Background, includes the project location and setting.

Section 3, Environmental Setting, includes a general discussion of the climate, geology, hydrogeology, historic land uses, previously identified contamination at the subject site, and a brief description of the contaminants found.
Section 4, Environmental Hazard Evaluation, includes specific contaminants of potential concern (COPC), and a general conceptual site model that describes the potential for exposure to COPCs.
Section 5, Environmental Hazard Management Plan, describes the strategies for managing potentially contaminated media and outlines the responsibilities of all contractors and subcontractors managing contaminated media.
Section 6, Notifications, Release Identification, Response, and Reporting, describes requirements related to contaminant response planning, release identification, and release reporting.
Section 7, Exposure Contingency Plan, includes contingency plans should planned and anticipated actions fail to adequately protect workers or mitigate the migration or spreading of contaminated media.
Section 8, References, lists the references cited throughout this EHE-EHMP.

Figures, accompanying the main text follow Section 8.
Appendix A, Laboratory Reports for soil samples collected at the site.
Appendix B, HDOH Tier 1 Environmental Action Levels (EALs), provides the current action levels for total lead based on different exposure scenarios.
Appendix C, Lead Fact Sheets prepared by the Agency for Toxic Substances and Disease Reporting and Hawaii State DOH that provide answers to the most frequently asked questions (FAQs) about exposure to lead, the occurrence of lead in Hawaiian soils, and the effects of exposure on human health.

2.0 PROJECT BACKGROUND

2.1 SITE BACKGROUND

The subject site consists of two parcels TMK: (1) 2-1-051:011 with addresses 676, 680 and 690 Halekauwila Street (including former Wong's Produce) and TMK (1) 2-1-051:012 with addresses of 615 and 625 Keawe Street. The subject site is located in the Kaka'ako neighborhood of Honolulu, which is undergoing revitalization. The site is bounded by Keawe and Coral Streets to the northwest and southeast, respectively (Figure 1). The buildings on the site consist of concrete and metal warehouses that were constructed between 1956 and the 1970s, based on historical Sanborn Maps.

A Phase I Environmental Site Assessment (ESA) conducted at the subject site indicated a boiler room at the former cold storage location, but no related UST was shown on historical Sanborn Fire Insurance Maps or existing site plans (MFA 2016). An old site plan provided by the current owner

included a drawing of a 2,500-gallon UST, but the tank location was not shown. Subsequently, a geophysical survey of the area near the former boiler room revealed a subsurface structure believed to be the UST associated with the boiler. This proved to be a 2,500-gallon tank.

In December 2017, the subject site was undergoing archaeological investigations in anticipation of demolition activities. During the archaeological dig, a 550-gallon UST was discovered next to the loading dock fronting the former Wong Produce storage building.

No USTs were found on the HDOH UST list under the site addresses of 670, 676, 680 and 690 Halekauwila Street, and "Wong's Produce". The heating fuel, 2,500-gallon UST did not require registering with the HDOH SHWB; however, the second UST was determined to be 550 gallons containing gasoline, which should have been registered.

Subsequently, the 2,500-gallon heating fuel UST, associated with the boiler and the 550-gallon UST were removed from the ground and closed at the former Wong's Produce at 690 Halekauwila Street, Honolulu, Hawaii from December 15 to December 19, 2017. The UST Closure Report documenting removal of both USTs and closure activities (MFA, January 2018) was submitted to the HDOH SHWB.

The USTs were intact (no holes and both tanks contained liquid product) upon excavation and removal. Field screening and visual observations did not indicate a release of product from either UST. The field decision was made to remove the USTs and close the excavations because the UST locations were in a populated area with pedestrian and vehicle traffic.

As part of closure activities, one multi-incremental (MI) soil sample was collected from each of the UST excavations (two total MI soil samples) for laboratory analysis of total petroleum hydrocarbons (full fuel scan), volatile organic compounds (VOCs) and semi-volatile organic compounds, and RCRA 8 metals (2,500-gallon UST) or Total lead (550-gallon UST), in accordance with SHWB guidelines for tank closures. The laboratory results were "not detected" (ND) at or above the laboratory reporting limits for all of the analyses except for some metals. The MI sample from the gasoline UST excavation had a Total lead concentration of 1300 mg/kg, exceeding the HDOH EAL of 200 mg/kg for the site scenario (unrestricted land use, not located over a drinking water source, and greater than 150 meters from an open water body). Four metals (arsenic, barium, chromium, and lead) were detected in the sample collected from the 2500-gallon UST, but all were below EALs. Laboratory results of the soil samples collected from the UST excavations are presented in Appendix A, and lead results are included in Table 1.

Groundwater was encountered in the UST excavations and measured at 5.5 feet below the ground surface. No sheen or free product was observed on the groundwater surface. Three groundwater monitoring wells were later installed in March 2018 and three groundwater samples collected.

Laboratory results of the groundwater samples did not report petroleum hydrocarbons or total lead in the groundwater.

Further investigation of the area surrounding the UST was recommended to estimate the extent of the lead in the soil, that was assumed to result from the UST. Seven additional soil borings (3 from installation of monitoring wells) were collected and analyzed for total lead. The details of soil investigation are included in our Site Investigation at Wong's Produce (MFA June, 2018). It was concluded that the lead in the soil did not come from the former gasoline UST and most likely brought in with fill material used at the site. The conclusions were based on lead content in shallow soil beneath the building and lead in shallow soils (about one foot bgs) approximately 30 feet distance from the former UST. According to the USDA Soil Survey, (see Section 3.1.1 below) the area is designated as fill material, that may have been placed in the 1930's or late 1920's. The area was apparently marsh lands prior to development. Site investigations observed sand with coral gravel during field logging of site borings and excavations which is typical of dredged fill material in Kakaako neighborhood. Not all of the subject site is designated as fill by the USDA. This EHE/EHMP includes the adjoining property at 615 Keawe Street, TMK (1) 2-1-051:012 which is designated as clay loam (Figure 2). No known contamination exists on the Keawe Street portion. We have included this property in the EHMP because construction encompasses both TMKs.

2.2 AREA BACKGROUND

Although the focus of this EHE-EHMP is to document potential hazards, controls, and a plan to follow related only to the concerns likely associated with lead contamination, it would be remiss to neglect to mention the larger area context, since it is possible that migration of offsite contaminants may impact the subject site and unknown conditions may exist.

From the previously mentioned Phase I ESA, adjoining properties are defined as "any real property or properties the border of which is contiguous or partially contiguous with that of the property, or that would be contiguous or partially contiguous with that of the property but for a street, road, or other public thoroughfare separating them" (ASTM, 2013). The adjoining properties follow:

- North (across Keawe Street)
  Current use is a parking lot;
  630 Keawe Street, TMK: (1) 2-1-031:029
  Fee Owner: SMK Inc.
- East
  4-story office building;
  606 Coral Street, TMK: (1) 2-1-051:007
  Fee Owner: BP Bishop Trust Estate
  Lessee: VH LLC
  Pohulani Apartments;
  630 Coral Street, TMK: (1) 2-1-051:013

  Fee Owner: Hawaii Housing Finance and Development Corp.
  RBI Builders and 'fiddlesticks too' (craft store);
  620 Coral Street, TMK: (1) 2-1-051:018
  Fee Owner: Hawaii Housing Finance and Development Corp.
- Southwest
  Halekauwila Place (apartment building) and associated parking structure;
  655 Halekauwila Street, TMK: (1) 2-1-051:043
  Fee Owner: State of Hawaii DLNR
  Lessee: Halekauwila Place LP.
- West
  Current use is an auto detailing shop;
  611 Keawe Street, TMK: (1) 2-1-051:031
  Fee Owner: The Katherine M. Cooper Trust
  Honolulu Bimmer Service (auto repair);
  670 Halekauwila Street, TMK: (1) 2-1-051:010
  Fee Owner: The Katherine M. Cooper Trust
- Northwest
  Servco Hawaii (auto dealership warehouse);
  607 South Street, TMK: (1) 2-1-031:030
  Fee Owner: Servco Pacific Inc.

The subject site is located in the Honolulu Rail Transit Project (HART) corridor. The HART project has prepared an EHMP for construction of the rail. Review of the HART EHMP (and other HDOH reports) show a nearby area as Cooke Street Lead Contamination (HEER Release ID 110013780051). The former Cooke Street Lead Company at 501 Cooke Street is less than ¼ mile from subject site. The Cooke Street site is reported as having lead contamination at the site that is currently managed with required engineering controls (paved). The Cooke Street site is listed as *Closed with No Further Action under Restricted Use* (May 11, 2005, HDOH HEER). Also nearby, is the former Kewalo Incinerator Landfill which is approximately ½ mile south of the subject site that contains buried ash from the former Honolulu Incinerator. The buried ash could contain high levels of metals including lead. Less than 500 feet from the subject site are two locations that are listed on the HDOH Hazard Emergency Evaluation Response (HEER) Release List (January 23, 2018). They include a leaking waste oil tank at 630 Keawe Street and a raw sewage spill at 600 Coral Street.

3.0 ENVIRONMENTAL SETTING

3.1 SITE CONDITIONS

The former Wong's Produce and Ililani LLC project site is in the USGS 7.5-minute Honolulu quadrangle. The address is 670-690 Halekauwila Street, in downtown Honolulu. The site is located on the southern coast of the island of Oahu. The site has been subjected to modern day development

and disturbance of the site's original deposited material. The site houses several concrete and metal warehouses that are mostly unused at this time. The entire site is currently asphalt or concrete paved. The surface areas adjacent to the USTs are paved with concrete and are used as parking. The concrete pavement over the UST areas was removed to allow excavation of the tanks; it was measured at 6 to 8 inches thick.

3.1.1 Site Topography, Geology, Groundwater and Soil

The subject site is essentially flat, with elevation increasing slightly to the north and east, and is less than 10 feet above mean sea level. The nearest surface water body is approximately 750 meters, or ½ mile south of the site at Kewalo Basin Harbor in Honolulu.

According to a recent USGS geologic map (2017), the site is sitting on the geologic unit named *Fill*, which is comprised of local fill material (sandy silt and coral gravel).

Mink and Lau (1990) identify the aquifer beneath the site as the Honolulu Aquifer, situated within the Nuuanu aquifer system. The coastal plain of Honolulu is characterized by two aquifers, an upper sedimentary caprock aquifer resting on a primary basalt aquifer. The upper sedimentary aquifer is classified as currently in use but is neither a source of drinking water nor ecologically important; it is of moderate salinity, replaceable and has a high vulnerability to contamination. During excavation of the USTs, groundwater was encountered in the excavation at an approximate depth of 5.5 feet below ground surface (bgs). Groundwater measurements of the three monitoring wells at the site recorded the groundwater table at 5.2' below ground surface and is expected to be tidally influenced.

The United States Department of Agriculture (1972) characterize the site soils on a portion of the subject site, the northeast side along Keawe St, as Makiki Clay Loam (MkA) and Ewa Silty Clay Loam (EmA). The majority of the subject site is designated as *Fill Land, mixed* (FL) (Figure 2). *Fill Land, mixed* "consists of areas filled with material dredged from the ocean or hauled in from nearby areas, garbage, and general material from other sources." (USDA, 1972). During excavation of the USTs and soil borings, the lithology observed was brown silty sand with coral gravel which was encountered directly beneath the concrete and graded to a tan sand to the depth of groundwater at approximately 5 feet below grade. At groundwater and to the total depth explored of 10 feet, coral gravel with gray and tan sand was observed (MFA June 2018).

3.2 CURRENT/FUTURE LAND USE

The site is completely developed with buildings and pavements. The site is scheduled for demolition and construction of a new residential high-rise building, with ground floor commercial space. The subject property consists of the following two (2) parcels (CCH HoLIS, 2016):

- 690 A Halekauwila Street, TMK: (1) 2-1-051:011

addresses listed at this TMK include: 676 A Halekauwila Street, 676 B Halekauwila Street, and 680 A Halekauwila Street
  - 10,095 square feet (0.232 acres)
  - Owned by: Kam Development LLC
- 615 Keawe Street, TMK: (1) 2-1-051:012
  addresses listed at this TMK include: 625 Keawe Street
  - 23,641 square feet (0.543 acres)
  - Owned by: Kam Development LLC

The subject property and its vicinity are in the Kakaako neighborhood of Honolulu, which sits between downtown Honolulu and the Ala Moana area, with Waikiki beyond that. Previously a residential neighborhood in the early 1900s (and earlier), the area transitioned into primarily commercial and light industrial uses during World War II. During the past several years, due to its location, many properties have been developed as high-rise condominiums, including the newly built residential high-rise across Halekauwila Street.

The site is planned for development as a residential affordable high-rise building. The Honolulu Rail Project is planned for construction on Halekauwila Street directly in front of the site. The site building plans for development were reviewed for this EHE. The proposed site plans show the site as completely paved in the area along Halekauwila Street and the former Wong's Produce. The developers, Ililani, LLC, confirm the area of lead contamination is to be paved and Halekauwila Street address is the location of the future building driveway entrance.

3.3 SAMPLING FOR CONTAMINANT OF POTENTIAL CONCERN (COPC)

The contaminant of potential concern for the site is total lead in soil. Environmental sampling of soil and groundwater at the site included analysis for contaminants such as total petroleum hydrocarbons (TPH) and other petroleum constituents, none of which were found in the soil or in the groundwater. Table 1 summarizes laboratory results from soil samples, multi-incremental soil samples, and groundwater samples collected at the site. Summaries of site environmental investigations and laboratory testing follow.

3.3.1 December 2017 Sampling for UST Closure

Two multi-incremental (MI) soil samples (Samples T-1 and T-2) were collected as part of the UST closures. Samples were collected at a depth of approximately 4 feet below ground surface and analyzed for total fuel scan; VOC which includes a total of 58 compounds such as benzene, toluene, ethylbenzene, xylenes and methyl tert-butyl ether (MtBE); semi volatile compounds (SVOCs) which includes 50 compounds such as naphthalene; and RCRA 8 metals including total lead (2,500-gallon UST) or total lead (550-gallon UST). UST locations and soil sample locations are depicted on Figures 3 and 4. Laboratory results for total fuel scan and petroleum constituents (volatile and semi-volatile organics) did not indicate any petroleum residuals in the subsurface soil. Laboratory analysis for soil sample collected at UST-1 (2,500-gallon diesel) did not detect

any petroleum constituents, and four metals (arsenic, barium chromium, and total lead) were detected below HDOH EALs. Laboratory results for soil sample at UST-2 (500-gallon gasoline) did not detect petroleum or any of its constituents in the soil. However, total lead was reported in the soil sample from the gasoline UST at 1,300 mg/kg, which exceeds the HDOH EAL of 200mg/kg for soil at sites with unrestricted land use. Laboratory results are included in Appendix A.

3.3.2 March 2018 Sampling for Lead in Soils

A total of seven discrete soil samples were collected on March 13, 2018 from the subject site: four at the corners of the former gasoline UST excavation, one at a nearby archaeological excavation approximately 12 feet south, and two from an archaeological excavation 14.5 feet northwest of the former gasoline UST (Figure 4). The three samples from nearby excavations were included to determine if surrounding soils had similar total lead content, exceeding the HDOH EALs, as was found beneath the UST during closure. Discrete samples were collected instead of MI samples to reduce disturbance to the archaeological excavations. All samples were collected at depths of three to five feet below ground to coincide with the UST depth. All samples were analyzed for toxicity characteristic leaching potential (TCLP) lead to determine if the lead in the soils has the potential to leach into the groundwater. Total lead was not analyzed on the four samples collected from the UST excavation, since the MI sample collected during the UST closure already indicated the total lead levels. Laboratory results of the seven samples showed elevated levels of total lead at 12 feet to the south and lower levels of lead at 14.5 feet to the northwest. Lead TCLP analysis of the soil indicated a low leaching potential (see Table 1 below) and that the soil at the subject site and beneath the former UST is acceptable for disposal at PVT Landfill, if excavated.

Laboratory analytical results (Appendix A) were compared to HEER Tier 1 Environmental Action Levels (EALs) for soil at a site with an unrestricted use, overlying a nondrinking water resource, and greater than 150 meters from the nearest surface water body, using the HDOH EAL Surfer (HDOH, Fall 2017). In addition to the Tier 1 EALs, soil concentrations were compared to detailed EALs for direct exposure, gross contamination, and leaching. Results of the HDOH Tier 1-Surfer evaluations are shown in Appendix B.

Figure 4 depicts locations of the former 550-gallon gasoline tank and the March 2018 samples. Table 1 below summarizes the laboratory results for lead in soil samples and highlights the samples exceeding the HDOH EAL of 200 mg/kg for lead in soil.

3.3.3 April 2018 Groundwater Investigation

In April 2018, MFA installed three groundwater wells. After installation, MFA personnel gauged, purged, and sampled the three monitoring wells (WMW-1, WMW-2, and WMW-3), the locations of which are shown on Figure 4. The monitoring wells were purged and sampled using a portable, low-flow variable-speed electric pump with dedicated tubing. Advanced Analytical Laboratory

(AAL) analyzed the groundwater samples for gasoline (TPH GRO), benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene, MtBE and for total lead. No analytes were detected in the groundwater at or above the laboratory reporting limits. Laboratory results are attached in Appendix A and summarized below in Table 1.

3.3.4 June 2018 UST Site Investigation

The HDOH SHWB requested a site investigation after the UST closure and well installation with soil and groundwater sampling and analysis. As part of the site investigation, four (4) additional soil boring were installed and identified as Borings B-1 to B-4. The site investigation included Decision Unit (DU) identification and multi-incremental (MI) soil sampling (MFA, June 2018). Additional MI samples were added to the investigation from the three soil cores collected during the monitoring well installation (WMW-1 to WMW-3).

Lead contamination was reported in multiple DUs, both across multiple borings and within the depth profiles of single borings. Table 1 lists the samples, the locations, the dates and the laboratory analytical results, Figure 4 shows the locations. Shallow soil at depths of 10 inches to 3 feet showed elevated levels of lead in soil, including soil beneath the concrete building. The soil borings drilled in the building showed a layer of dark brown sand with coral fragments (fill) that contained black material (possibly organics or ash) and included small pieces of glass and brick. A hand held x-ray fluorescence (XRF) field instrument was used to record lead concentrations of this material and reported at 1000-2000 ppm lead. This shallow layer of dark brown soil was not observed in soil borings from the driveway area. The results of the Site Investigation indicated the lead contamination most likely did not originate from the UST and the lead contamination may have been brought in with the fill material. The Kakaako marshy areas were filled using dredged fill and/or other fill material from nearby areas (including garbage) prior to 1940’s (USDA 1972).

3.4 SUMMARY OF ENVIRONMENTAL SITE INVESTIGATIONS

Table 1 below summarizes the results of all samples collected during the environmental investigations at the subject site. Red font indicates laboratory results that exceed the HDOH EAL of 200 mg/kg for lead in soil for the site setting, which is unrestricted land use, overlying a non-drinking water resource and is greater than 150 meters distance to nearest surface water body. No petroleum constituents were detected in soil nor groundwater samples.

TABLE 1. Summary of Environmental Sample Laboratory Results

SAMPLE	DETAIL LOCATION	SAMPLE MEDIUM *Sample Date*	COPC	LAB RESULT in mg/kg for soil, in ug/kg for groundwater*
T-1	MI sample Diesel UST-1 at 4' below grade	Soil *December 18, 2017*	TPH full	ND
			BTEX	ND
			MTBE	ND
			Naphthalene	ND
			Total Lead	150
T-2	MI sample gasoline UST-2 at 4' below grade	Soil *December 19, 2017*	TPH full	ND
			BTEX	ND
			MTBE	ND
			Naphthalene	ND
			Total Lead	**1300**
#1--E-4	Discrete sample from former UST excavation, collected at 4' below grade at the east end of excavation	Soil *March 13, 2018*	TCLP lead	ND
#2--N-5	Discrete sample from former UST excavation at 5' below grade at the north end of excavation	Soil *March 13, 2018*	TCLP lead	ND
#3--S-5	Discrete sample from former UST excavation at 5' below grade at the south end of excavation	Soil *March 13, 2018*	TCLP lead	ND
#4--W-5	Discrete sample from former UST excavation at 5' below grade at the west end of excavation	Soil *March 13, 2018*	TCLP lead	ND
#5--NW-4	Discrete sample from near UST excavation (14.5' distance) to the NW at 4' below grade	Soil *March 13, 2018*	TCLP lead	ND
			Total lead	86

SAMPLE	DETAIL LOCATION	SAMPLE MEDIUM *Sample Date*	COPC	LAB RESULT in mg/kg for soil, in ug/kg for groundwater*
#6--SW-3	Discrete sample from near UST excavation at (14.5' distance) to the NW at 3' below grade	Soil *March 13, 2018*	TCLP lead	0.08
			Total lead	**240**
#7--S-4.5	Discrete sample from (14.5' distance) to the NW at 4.5' below grade	Soil *March 13, 2018*	TCLP lead	0.30
			Total lead	**1100**
MW-1-3 (DU 1-3)	MI sample from soil borings Wells MWM-1, WMW-2 and WMW-3 from 4 to 5 feet	Soil *April 17, 2018*	Total lead	60
			TPH GRO	ND
			BTEX	ND
			MTBE	ND
			Naphthalene	ND
WMW-1	Monitoring Well WMW-1 In former UST-2 excavation	Groundwater *April 25, 2018*	TPH GRO	ND
			BTEX	ND
			MTBE	ND
			Naphthalene	ND
			Total Lead	ND
WMW-2	Monitoring Well WMW-2 In former UST-2 excavation	Groundwater *April 25, 2018*	TPH GRO	ND
			BTEX	ND
			MTBE	ND
			Naphthalene	ND
			Total Lead	ND
WMW-3	Monitoring Well WMW-3 In former UST-2 excavation	Groundwater *April 25, 2018*	TPH GRO	ND
			BTEX	ND
			MTBE	ND
			Naphthalene	ND
			Total Lead	ND

SAMPLE	DETAIL LOCATION	SAMPLE MEDIUM *Sample Date*	COPC	LAB RESULT in mg/kg for soil, in ug/kg for groundwater*
DU-1	MI sample from soil boring Well WMW-1. The entire soil core from 1 to 10'	Soil *May 22, 2018*	Total lead	9.5
DU-2	MI sample from soil boring Well WMW-2. The entire soil core from 1-10 feet	Soil *May 22, 2018*	Total lead	96
DU-2 Duplicate	Duplicate MI sample from soil boring Well WMW-2. The entire soil core from 1-10 feet	Soil *May 22, 2018*	Total lead	110
DU-2 Triplicate	Triplicate MI sample from soil boring Well WMW-2. The entire soil core from 1-10 feet	Soil *May 22, 2018*	Total lead	110
DU-3	MI sample from soil boring Well WMW-3. The entire soil core from 1-10 feet	Soil *May 22, 2018*	Total lead	2.3
DU-4	MI sample from soil borings Wells MWM-1, WMW-2 and WMW-3 from 1 to 4 feet	Soil *May 22, 2018*	Total lead	200
DU-5	MI sample from soil borings Wells WMW-1, WMW-2 and WMW-3 from 5 to 10 feet	Soil *May 22, 2018*	Total lead	6.8
DU-6-B1	MI sample from Soil Boring B-1. The entire soil core from 1-5 feet bgs	Soil *June 4, 2018*	Total lead	140
DU-7-B2	MI sample from Soil Boring B-2. The entire soil core from 1-5 feet bgs	Soil *June 4, 2018*	Total lead	**250**
DU-8-B3	MI sample from Soil Boring B-3. The entire soil core from 1-5 feet bgs	Soil *June 4, 2018*	Total lead	120

SAMPLE	DETAIL LOCATION	SAMPLE MEDIUM *Sample Date*	COPC	LAB RESULT in mg/kg for soil, in ug/kg for groundwater*
DU-9-B4	MI sample from Soil Boring B-4. The entire soil core from 1-5 fee bgs	Soil *June 4, 2018*	Total lead	**290**
DU-10 BA-3	MI sample from Soil Borings B-1 to B-4 from 1 to 3 feet	Soil *June 4, 2018*	Total lead	**720**
DU-10 BA-3 Duplicate	Duplicate MI sample from Soil Borings B-1 to B-4 from 1 to 3 feet	Soil *June 4, 2018*	Total lead	**840**
DU-10 BA-3 Triplicate	Triplicate MI sample from Soil Borings B-1 to B-4 from 1 to 3 feet	Soil *June 4, 2018*	Total lead	**830**
DU-11-BA-5	MI sample from Soil Borings B-1 to B-4 from 3 to 5 feet	Soil *June 4, 2018*	Total lead	16

ND - not detected at or above the laboratory reporting limits
* units for groundwater sample results are mg/L for TPH and ug/L for lead and VOCs.
The HDOH EAL for lead is 200 mg/kg for the site setting of: unrestricted land use, overlying a non-drinking water resource, and greater than 150 meters distance to the nearest surface water body.

4.0 ENVIRONMENTAL HAZARD EVALUATION

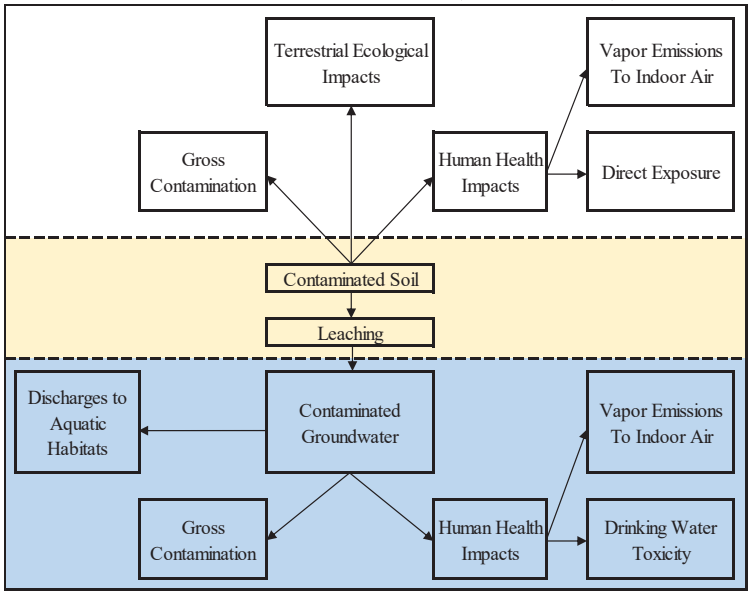
4.1 CHEMICALS OF POTENTIAL CONCERN

The chemical of potential concern (COPC) is total lead. Appendix C includes Federal and State Fact Sheets for lead that provide answers to frequently asked questions (FAQs) concerning lead hazards. No other COPC has been identified on site. Total lead found in the soil was assumed to have originated from the gasoline UST, although no holes were found in the tank upon removal. The site investigation results found lead contamination at shallow depths (one to two feet below ground surface) at a distance of 30 feet upgradient from the former UST, indicating the lead contamination did not result from the gasoline UST. Additionally, petroleum and its constituents were not detected in soil or groundwater beneath the USTs. Although no gasoline or petroleum constituents were detected in soil samples collected at and around the USTs, this EHMP (Section 7.0) includes petroleum as part of the contingency plan for uninvestigated areas of the subject site.

4.2 CONCEPTUAL SITE MODEL (CSM)

The following Flow Chart 1 is from the HDOH TGM Figure 3.5; it displays the environmental hazards that should be considered at a site that has contamination. The following sections summarize the site conditions environmental hazards. Based on those, we revised the CSM to a site-specific model that is presented in Section 4.10.

Flow Chart 1. Summary of Environmental Hazards Considered in a Typical Environmental Hazard Evaluation (after HDOH 2017)



4.3 TIER 1 ENVIRONMENTAL ACTION LEVELS (EALs)

Decisions for management of contaminated soil and groundwater will be based on regulatory environmental action levels (EALs). HDOH has developed conservative Tier 1 EALs to quickly screen soil and groundwater data for potential environmental and health hazards, as illustrated in Appendix B. The Tier 1 EALs for unrestricted land use are not required, regulatory cleanup standards, but rather the concentration of a contaminant in the respective medium where the threat to human health or the environment is considered to be insignificant under any site condition. Tier 1 EALs for unrestricted land use assume that there are no restrictions on current or future use of

the property, including potential use as residential housing, schools, day care, and health care. As a result, exceeding the Tier 1 EAL for unrestricted land use for a specific chemical does not necessarily indicate that the contamination poses a significant threat to human health or the environment, but only that additional evaluation may be warranted. Thus, contaminant concentrations could be significantly higher than the Tier 1 EALs for unrestricted land use and still be protective of human health and the environment. For example, alternative action levels may be most appropriate for sites that will be restricted, or for soil that is deep or otherwise isolated such that human exposure is unlikely. The EALs for deep or otherwise isolated lead contaminated soil is 2,500 mg/kg (for residential properties) as shown in Table F-3 in the HDOH Tier 1 evaluations in Appendix B.

4.4 GROSS CONTAMINATION

According to the HDOH 2017 guidance document previously cited, "Gross contamination" action levels for soil address odor and aesthetic concerns and resource degradation in general. The action levels also help identify soil with mobile free product or explosive levels of vapors. Total lead does not pose a vapor or odor hazard. Gross contamination in soil is a concern at the subject property, if engineering controls (i.e. pavements) are removed, exposing the underlying soil. All soil samples with elevated levels of lead were collected below the ground at depths of 3 to 5 feet, with the highest concentrations at 5 feet below ground surface.

Gross contamination of lead in groundwater from the subject release is not considered a concern based on low leaching potential of lead in soil and laboratory results of discrete samples (see Table 1, TCLP lead). Total lead was not detected in the groundwater samples collected at the subject site. Gross contamination of groundwater does include potentially mobile petroleum free product, nuisance odors from surface water, petroleum hydrocarbon sheen on surface water, and general resource degradation. Petroleum hydrocarbons were not observed on the exposed groundwater in the UST excavations, and no petroleum contamination was detected in the groundwater samples. Although gross contamination of groundwater related to the subject release is not a concern, the EHMP (Section 7.0) incorporates groundwater as part of the contingency plan for unknown conditions at the site and/or possible migration from an off-site source.

4.5 DIRECT EXPOSURE

A direct exposure hazard involves human contact with contaminated soil and groundwater, or soil vapor either directly or indirectly. Direct contact can occur via incidental ingestion or dermal contact, or contact of dust in outdoor air. Indirect contact can occur via inhalation of soil dust in outdoor air. In general, lead contaminants in soil are relatively immobile, are potentially toxic to humans, and can threaten ecological receptors.

In the absence of engineered controls (pavement, physical barriers) and institution controls (management actions such as utilizing proper care and personal protection equipment (PPE) during

construction), future human populations at the property could be exposed to contaminated soil (including contaminated dust). Direct exposure to lead contaminated soil is an environmental hazard of concern at the subject site.

4.6 VAPOR INTRUSION

Vapor intrusion involves exposure of human populations to volatile chemical compounds that have entered a building or other enclosed structure from contaminated subsurface soil or contaminated groundwater. In general, contaminants in areas considered to present a vapor intrusion hazard are volatile chemicals that are toxic to humans via inhalation of vapors.

Lead is not a volatile contaminant and does not create a vapor. Therefore, vapor intrusion from the subsurface is not a concern at the site.

4.7 LEACHING

Leaching is movement of contaminants from vadose-zone soils into underlying groundwater through chemical and physical mechanisms. The principal chemical mechanism is dissolution of contaminants into water (e.g., percolating rainwater, irrigation water) moving downward through the vadose zone. Physical mechanisms include (1) entrainment of contaminants bound in a colloid phase by water moving through the vadose zone, and (2) mass movement of contaminants through the vadose zone by infiltrating water. Most contaminants in areas considered to present a leaching hazard typically are mobile, volatile chemicals that are toxic to humans and may threaten ecological receptors at sites close to surface water bodies.

Lead is not typically mobile in soil and its leaching potential is normally low. Laboratory testing of the soil on site includes the Toxicity Characteristic Leaching Potential (TCLP) for lead. The highest concentration of TCLP lead in the samples analyzed for TCLP was 0.30 mg/L (using the soil sample with the total lead concentration of 1100 mg/kg) confirming the low leaching potential at the site.

4.8 IMPACTS TO TERRESTRIAL AND AQUATIC HABITATS

Ecotoxicity refers to the capability of a contaminant to damage an ecological population, ecological community, or ecosystem. The ecotoxicity of a contaminant typically is based on its toxicity to one or more species, its persistence in the environment, and its ability to bioaccumulate. Under consideration are flora and fauna in terrestrial (i.e., land) habitats and aquatic (e.g., marine) habitats.

4.8.1 Terrestrial Ecotoxicity

Impacts on terrestrial flora and fauna can occur through exposure of populations to contaminated soil. The site is currently capped with buildings and pavements; furthermore, there are no current

or anticipated sensitive ecological receptors at the site. Therefore, terrestrial eco-toxicity is not considered an environmental hazard at the subject site.

4.8.2 Aquatic Ecotoxicity

Impacts on aquatic flora and fauna can occur through discharge of contaminated groundwater into surface waters. Most contaminants in areas considered to present an aquatic eco-toxicity hazard typically are mobile, volatile chemicals that are toxic to ecological receptors. Due to the non-mobile nature of lead contaminants and the distance to surface water (>150 meters), aquatic eco-toxicity is not considered an environmental hazard at the subject site.

4.9 POTENTIAL EXPOSURE PATHWAYS

Identified potential exposure pathways to human receptors include ingestion, inhalation, and dermal contact. These are described briefly below.

4.9.1 Ingestion

Ingestion is oral intake of a solid or liquid material. Ingestion of contaminated soil or groundwater is a human health risk and a direct exposure hazard. Accidental ingestion of contaminated soil is a potential concern during construction if contaminated soil is encountered. This includes the potential for contaminated soil or dust getting transported from the site (on clothes, boots, etc.) into workers’ residences and other locations.

4.9.2 Inhalation

Inhalation is the act of drawing air, other gases, vapors, fumes, smoke, dust, or mists into the lungs. Inhalation of contaminated soil (as dust) is a human health risk and a direct exposure hazard. Lead does not release any vapor from surface soil and does not pose an indirect vapor exposure hazard. During excavation and construction activities, lead-contaminated subsurface soils may be disturbed, and may pose a potential for release of dust into the work area.

4.9.3 Dermal Contact

Dermal contact is direct exposure of skin to solids, liquids, or gases. Dermal contact with contaminated soil, groundwater, or soil vapor is a direct exposure hazard. During excavation and construction activities, contaminated subsurface soils may be encountered, thus increasing potential for dermal contact. Dermal contact may be of concern during construction activities at the subject site if contaminated soil is encountered.

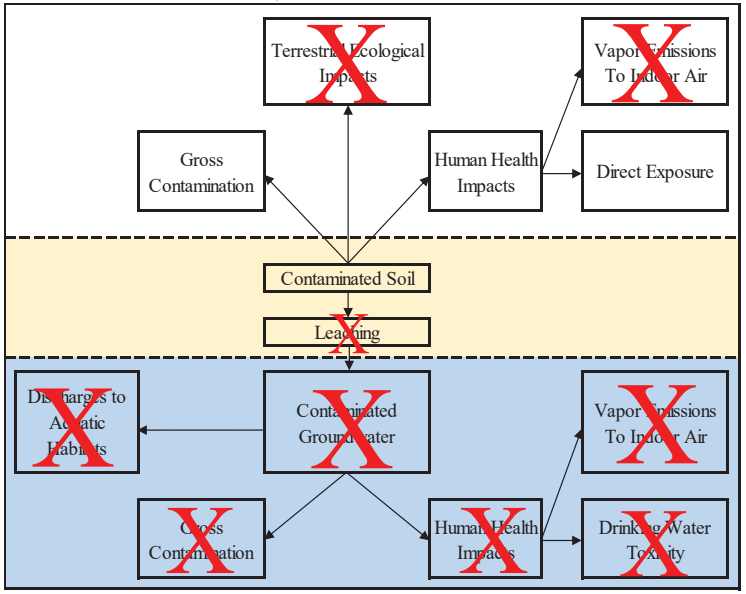
4.10 CONCLUSION

Under current site conditions, the only exposure pathways for humans, flora, and fauna are open excavations, which will later be paved over. The EHMP is site-specific and addresses the lead contamination hazard during future demolition and construction activities. The EHE addresses the

health impacts to humans and the hazards to the environments. Construction activities may expose lead contamination in the subsurface soil and are addressed in the following EHMP.

The potential environmental hazards identified are gross contamination and direct human contact with the lead-contaminated soil. A revised CSM is presented below.

Flow Chart 2. Summary of Environmental Hazards at the Site-Final CSM



5.0 ENVIRONMENTAL HAZARD MANAGEMENT PLAN

This EHMP has been developed to (1) reduce the potential exposure of workers to lead contamination in the soil during construction, (2) decrease the likelihood of releases to the environment from the known lead contamination in the soil, and (3) identify how contaminated environmental media such as soil, groundwater and soil vapor should be managed during construction activities.

The EHMP includes engineering and institutional controls, as well as requirements for personal protective equipment (PPE). Prior to initiation of construction work, on-site workers should be informed and educated about potential hazards posed by lead, and methods to prevent exposure.

5.1 HAZARD COMMUNICATION

Prior to beginning field work, the Contractor and Subcontractor staff should be provided with a copy of this EHE-EHMP and should familiarize themselves with this document and agree to abide by its provisions. An environmental professional, industrial hygienist, or other properly trained person with experience in managing the remediation of contaminated media should be consulted and/or present while work is being conducted in areas where contaminated media are known to exist, or when evidence of contamination is detected by construction workers. Once contamination is identified, construction activities that pose a potential risk of exposure to contaminated soil or dust (such as excavation of soil), or exposure to contaminated groundwater or vapors, must be supervised by personnel who have current 40-hour hazardous waste operations and emergency response (HAZWOPER) certification and/or 8-hour hazardous waste operations supervisor certification (29 *Code of Federal Regulation* [CFR] 1910.120), and who are able to identify potential needs for upgrading the level of health and safety protection. The environmental professional shall do the following:

- Review this document and communicate hazards to the field crews at a preconstruction and/or tailgate safety meeting before beginning work.
- Monitor excavated soil for visible evidence of contamination, unusual odors, or elevated measurements from field instruments or test kits.
- Monitor groundwater in excavations for visible evidence of contamination, unusual odors, or elevated measurements from field instruments or test kits.
- Collect samples for laboratory analysis.
- Direct the placement of excavated soil in appropriate waste disposal containers or stockpiles within the Work Area onsite or at contractor yards.
- Direct the appropriate use of excavated soils as backfill.
- Provide health and safety guidance related to the potential exposure of workers to COPCs.
- Monitor the work activities to ensure compliance with this EHMP.

5.2 ENGINEERING CONTROLS REQUIREMENTS

Currently, engineering controls protect personnel onsite from hazards associated with the subsurface contamination. These controls consist of pavement (capping) over the entire site, with the exception of the excavations from which USTs were removed and archaeological investigations, which will be re-paved. If these controls are removed or disturbed, they should be replaced following that activity that has disturbed them.

Dust control methods may be necessary during construction-related work in which suspect contaminated soil is encountered. These controls include use of plastic sheeting for soil stockpiles, and dust suppression using applied water.

It is anticipated that Level D PPE will be appropriate for workers during future construction. Should site conditions warrant, the PPE should be upgraded to Level C or adding disposable overalls (Tyveks) to Level D. Ultimately, the contractor is responsible for monitoring site conditions and supplying site workers with appropriate training and PPE, in accordance with 29 Code of Federal Regulations (CFR) 1910 and 29 CFR 1926.

5.3 INSTITUTIONAL CONTROLS REQUIREMENTS

Institutional controls include the management of suspected contaminated soil and methods for worker protection. Institutional controls include erecting barriers that prevent individuals from unnecessarily entering work zones, minimizing the size of excavations, backfilling excavations in a timely manner, covering soil stockpiles with plastic sheeting, suppressing dust using applied water, using appropriate PPE, and use of closed, air-conditioned heavy-equipment cabs.

5.4 SOIL AND GROUNDWATER MANAGEMENT FOR FUTURE SITE ACTIVITIES AFFECTING ON-SITE CONTAMINATION

5.4.1 Pre-Excavation Evaluation of Soils

On-site workers need to minimize the probability of releases of contamination from excavations during construction. They should familiarize themselves with site conditions and the potential presence of lead contamination in the subsurface soil.

5.4.2 Soil Excavation and Handling

PPE should be worn so that workers do not have direct dermal contact with suspect contaminated soil. Dust control and/or PPE should be utilized to minimize exposure from airborne dust. Lead-contaminated soils do not pose a vapor hazard. Lead-contaminated soils are not visibly obvious and do not have any identifying odors. It is recommended that if soil is exposed or excavated in the known or suspected area of lead contamination, the soil should be monitored during construction. Soil monitoring in the field would require a hand-held X-ray florescence (XRF) instrument to determine lead concentrations in the material. Suspect contaminated material should be segregated from clean soil.

Potentially contaminated soil should be stockpiled as detailed below. Equipment that comes in contact with potentially contaminated soil should be scraped and brushed to remove any material on it, before it is either used at “clean” locations or removed from the site. The potentially contaminated soil should be included in the stockpile. Equipment should then be rinsed. The

rinsate may be collected in an impervious container; the rinse water allowed to evaporate; and the residue added to the soil stockpile.

The stockpiled soil should be characterized by sampling and profiling then disposed at an approved and accepting facility in Hawai‘i (such as PVT Landfill). Based on laboratory results of the soil stockpile samples, the stockpiled soil may be returned to the area of origin and capped by pavement. Any suspect soil returned to the subsurface shall be above the groundwater table and below 2’ grade and capped with pavement. No suspect soil shall be used in utility trenches.

5.4.3 Soil Stockpiling/Storage

In the event of suspect contamination, soil should be placed on a chemically resistant geomembrane / polyethylene liner with minimum thickness of 6 millimeters, covered, and bermed. The cover material shall be extended over the berms and be anchored or ballasted. Berms shall be minimum 12 inches high, and constructed of earth, biosocks, wattles, sandbags, or similar. The liner system shall be sloped to allow collection of leachate, which shall be collected and temporarily stored in appropriate permeable container such as a 55-gallon drum.

5.4.4 Disposal

If the volume of excavated soil is less than one cubic yard (equivalent to about three 55-gallon drums), it can be replaced in the excavation upon completion of the work without further evaluation. If excavated soil is not to be re-used onsite and will be disposed, it should be profiled in accordance with the requirements of the receiving facility and transported with documentation.

Excavated material that is desired to be used as fill on a different portion of the site or offsite must be evaluated in accordance with the HDOH Hazard Evaluation and Emergency Response (HEER) Office’s *Guidance for the Evaluation of Imported and Exported Fill Material, Including Contaminant Characterization of Stockpiles*, October 2011 (or updated version as applicable), or in consultation with the HEER Office.

5.4.5 Groundwater Handling and Disposal

Lead in the soil at the site is known to have a low potential for leaching into the groundwater. Laboratory analysis of groundwater samples at the subject site did not contain lead or petroleum contaminants. Groundwater quality in the area maybe considered suspect for contamination due to unknown conditions, such as nearby former and current auto repair facilities (Section 2.2). Groundwater may be returned to the excavation from which it was taken unless there is petroleum free product floating on groundwater. If there is free product report the release, take health and safety precautions and refer to Section 7.5.

If groundwater monitoring is conducted, purge water and decontamination water may be spread on the ground in the immediate vicinity and allowed to evaporate, provided there is no free product, and the water is not allowed to run off into storm drains or offsite.

Groundwater may not be discharged into storm drains or State waters unless National Pollutant Discharge Elimination System (NPDES) permit coverage has been granted and permit conditions met.

5.5 EXPOSURE MANAGEMENT

5.5.1 Awareness/Training for Contamination Managed On-Site

Personnel involved with management at the site should be familiar with this document.

5.5.2 Construction Worker Notifications and Protections

All construction workers who may conduct onsite excavation should be provided with this document at the time bids for their work are solicited.

5.5.3 Health and Safety Plan

A Health and Safety Plan should be prepared and provided to all workers performing excavations, because they could potentially encounter lead-impacted soils. The Health and Safety Plan should include the following:

- General site control and safety requirements such as site access controls, information on emergency medical facilities, use of PPE and good worker practices;
- Description of known and potential hazards;
- Emergency response procedures for chemical exposure, including eye and skin exposure, internal exposure, and inhalation exposure; and
- Emergency contact information.

A Health and Safety Plan is not a substitute for OSHA/ Hawai‘i Occupational Safety and Health (HIOSH) requirements. Employers of construction workers/utility workers must comply with all applicable OSHA/HIOSH requirements.

6.0 NOTIFICATIONS

The HDOH should be notified if any planned activity is expected to change existing engineering controls or potentially encounter underlying contamination.

Discovery of future noticeable contamination would be considered a separate release and must be reported as such. Any encounters with petroleum-contaminated soil, or contaminated groundwater during subsurface activities is considered a release and must be reported to the HEER Office. Releases that occur during construction activities should also be reported. A verbal notification must occur within 20 minutes of discovery of the release, followed by written notification.

6.1 RELEASE REPORTING

In the event of a release that causes an imminent threat to human health or the environment, the first call shall be to 9-1-1.

Immediate verbal notification shall be provided to the Hawai‘i State Emergency Response Commission (HSERC)/HEER) (808-586-4249, or 808-247-2191 after work hours) and the Local Emergency Planning Committee (LEPC) (808-723-8960) after discovery of contaminated soil and/or groundwater. Notification must be via phone or in person.

Notification should occur within 20 minutes of discovery of the release. There is no penalty for reporting a release unnecessarily, but there are large penalties for failing to report a release.

A release of petroleum would be indicated by any of the following:

- Any amount of oil that causes a sheen on the groundwater in an excavation.
- Any free product that appears on groundwater.
- Visual or olfactory evidence of petroleum contamination.

If free product is encountered, report the release in accordance with Hawaii Administrative Rules (HAR) 11-451, State Contingency Plan. It is not necessary to stop work if you follow proper notification procedures.

Follow-up written notification must be sent to HSERC/HEER no later than thirty (30) days after initial discovery of a release.

7.0 EXPOSURE CONTINGENCY PLAN

An exposure contingency plan is intended to guide what should be done when engineering controls, administrative controls, or PPE fail to function as designed. The activities in this section are intended to supplement the exposure prevention and control procedures identified in Section 5.0. This exposure contingency plan consists of several individual plans, each addressing a potential source:

Soil Contingency Plan
Groundwater Contingency Plan
Stormwater Contingency Plan
Free Product Contingency Plan
Vapor Contingency Plan
Debris Contingency Plan
Unanticipated or Unknown Materials Contingency Plan

In addition to soil management, this portion of the document includes plans for groundwater, free product, vapor, debris and unknown materials even though these concerns have not been identified at the site and are not expected at the site. The contingency plans include additional information for unknown or unanticipated situations during construction.

Before beginning construction, and regularly during construction, workers shall be informed about these contingencies and when they should be implemented. The listed items are not intended to preclude the development of other solutions. When elements of this contingency plan are implemented, the implementation should be recorded; reported to field crews, supervisors, oversight personnel; and their use approved by the site health and safety officer and the environmental professional monitoring the construction work.

If an engineering control, administrative control, or PPE fails, the first priority is to provide health and safety assistance and (if needed) first aid. Personnel should not enter an area with an imminent risk to human health or life. Once safety concerns have been addressed, immediate action should be taken to respond to the release of COPCs. In all instances, common sense, good judgment, training, and experience should prevail.

7.1 CONTINGENCY INFORMATION AND NOTIFICATION

An emergency notification list should be prepared and maintained. This list should identify the individuals to whom failed engineering controls, administrative controls, or PPE must be reported.

Information should be prepared showing the layout of the construction areas, the known and anticipated locations of lead-contaminated soil (hazardous substances), and the locations of emergency medical supplies and spill response equipment. This information should be conspicuously posted in a location commonly used by construction workers, and the workers should be briefed on the information.

7.2 SOIL CONTINGENCY PLAN

This Soil Contingency Plan provides guidelines for the actions to be taken when engineering controls, administrative controls, or PPE fail and there is an imminent risk of exposure to COPCs, or when unanticipated contaminated soil is encountered.

7.2.1 Open Excavations

During construction, COPCs in soil could be exposed during demolition of utilities or subsurface structures, when buried pipelines or cables are relocated, new utilities are installed, foundations are dug, or when constructing other subsurface structures. If COPC concentrations and direct exposure hazards are greater than anticipated, the need for heightened precautions should be assessed, and the following possible actions taken:

- If appropriate, PPE should be upgraded from Level D to Level C.
- Contaminated soil should be segregated from uncontaminated soil and managed in accordance with the procedures detailed in in Section 5.4. If needed, work should stop until preparations to handle the contaminated soil have been completed.
- Stockpiled contaminated soil or groundwater that is the source of exposure should be contained or removed from the site before resuming work.
- If airborne dust generated from COPCs becomes significant, additional dust control measures should be implemented.

7.2.2 Soil Stockpiles

During construction activities, plastic sheeting used to underlie, berm and cover soil stockpiles could be damaged by strong winds or punctured by equipment, debris or other sharp objects. This damage could allow site workers to encounter COPC or stormwater to encounter the contaminated soil. The following actions should be taken to prevent potential exposure.

- Damaged sections of plastic sheeting should be promptly replaced.
- Damaged sections of the berm should be promptly repaired.

7.3 GROUNDWATER CONTINGENCY PLAN

Groundwater samples collected at the site did not detect any contamination. The Groundwater Contingency Plan provides guidelines for what should be done when engineering controls, administrative controls, or PPE fail and an imminent risk of exposure to contaminated water exists.

7.3.1 Open Excavations

During construction activities, contaminated groundwater could be exposed in excavations used to install pipelines, electrical and communication cables, foundations (including drilled shafts), or other subsurface structures. If contaminated groundwater creates a direct exposure hazard, the following actions may need to be taken.

- Review this document and do not return to the construction area until it has been determined that is safe.
- PPE could be upgraded from Level D to Level C.
- The excavation could be backfilled using sand, gravel, or other approved and appropriate materials to a height above the standing water. In such a case, backfill shall not displace contaminated groundwater such that it overflows the excavation.
- Contaminated groundwater should be managed in accordance with the procedures detailed in Section 5.4.
- If it becomes necessary to remove contaminated groundwater from the excavation, it should be stored in appropriate containers before treatment and disposal.

- If you intend to dispose of the groundwater off site, collect and analyze water samples as required by the disposal facility.

Contaminated groundwater should never be discharged into storm drains or watercourses or areas beyond the work area.

7.4 STORM WATER CONTINGENCY PLAN

The Storm Water Contingency Plan provides guidelines for the actions to be taken when engineering or administrative controls fail and there is an imminent risk of storm water becoming contaminated by COPCs or of contaminated storm water discharging offsite.

7.4.1 Open Excavations

During construction, storm water could encounter contaminated soil or groundwater in utility or other subsurface structures. If a storm event more severe than anticipated threatens an overflow of an excavation that contains contaminated water, the following actions may be taken.

- The height of the berm along the upstream edges of the excavation could be increased to prevent storm water runoff from entering the excavation.
- Modifications in the storm water runoff diversion system could be made to carry water away from the excavation or active Work Areas.
- Storm water in bermed areas or in excavations could be pumped into containers for later treatment and discharge.
- Excavations could be covered with plywood and plastic sheeting to prevent the direct entry of precipitation or storm water runoff.
- Excavations could be backfilled to prevent the direct entry of precipitation or storm water runoff. In such a case, backfill shall not displace contaminated groundwater such that it overflows the excavation.

7.4.2 Soil Stockpiles

During construction activities, storm water could encounter COPCs stored in stockpiles. If rainwater or runoff begins to wash away stockpiled soil, or winds damage plastic covers over the stockpile, the following actions should be taken.

- Berms surrounding soil stockpiles damaged by a storm should be repaired.
- The height of the berm surrounding the stockpile may be increased.
- Water in the bermed stockpile area could be pumped into containers for subsequent treatment and discharge.
- Diversion structures could be created to divert storm water away from soil stockpiles.

- Damaged plastic sheeting covering soil stockpiles should be repaired or replaced. Additional plastic sheeting may be necessary.

7.4.3 Storm Water Discharges

During construction activities, storm water could enter the construction areas and encounter contaminated soil or groundwater. If rainwater or runoff enters a construction area, the following action should be taken.

- Diversion structures could be improved to divert storm water away from construction areas.
- A runoff water containment area could be created to capture water.
- Moveable petroleum-absorbent booms or pads could be deployed to capture COPCs in areas where storm water enters or leaves the site.

7.5 FREE PRODUCT CONTINGENCY PLAN

The Free Product Contingency Plan provides guidelines for what should be done when engineering controls, administrative controls, or PPE fail and workers, the public or ecological receptors could be exposed to free product, or when an imminent risk of a fire or an explosion is created.

If free product is encountered, report the release in accordance with Hawaii Administrative Rules (HAR) 11-451, State Contingency Plan. It is not necessary to stop work if you follow proper notification procedures.

7.5.1 Open Excavations

During construction activities, free product could be encountered in excavations used to install utility corridors or other subsurface structures. If free product poses a direct risk to workers, the following actions may be taken.

- Follow-up written notification must be sent to HSERC/HEER no later than thirty (30) days after initial discovery of a release.
- PPE could be upgraded from Level D to Level C.
- Use absorbent pads, booms or other means to prevent free product from entering any storm drains, sanitary sewers, or surface waters. If the volume of free product encountered is too great for absorbent pads to manage effectively, a vacuum truck could be used to pump product out of the excavation and transport it for treatment and disposal.
- If needed for stability and/or safety, after removing the free product, the excavation could be backfilled using appropriate materials (for example, gravel, select borrow) to a height above any standing water.
- If free product is encountered in excavated soil, it must be separated from clean or moderately contaminated fill, profiled, and disposed of at an approved recycling/disposal site.

7.5.2 Free Product Recovery and Storage

During construction activities, free product being recovered and temporarily contained or stored onsite could leak from recovery equipment and/or storage units and released to surrounding areas. If recovered free product is released from recovery equipment or storage units, the following actions should be taken.

- Use absorbent pads, booms or other means to prevent free product from entering any storm drains, sanitary sewers, or surface waters. If the volume is too great for absorbent pads, booms, or secondary berms to manage effectively, a vacuum truck could be used to pump the product out of the excavation or storage units and transport it for treatment and disposal.
- At least once daily, remove oil observed floating on the groundwater during excavation activities using a vacuum truck, absorbent pads, or other methods approved by the HEER Office. Excavations should not be backfilled until the floating oil is removed to the extent practicable, which is when further use of vacuum trucks or absorbent pads, or other approved methods do not result in further floating oil removal.
- If needed, after removing the free product, the equipment should be repaired or replaced, and any areas contaminated by the free product should be cleaned up.

7.6 VAPOR CONTINGENCY PLAN

The Vapor Contingency Plan provides guidelines for what should be done when engineering controls, administrative controls, or PPE fail and an imminent risk of exposure to hazardous vapors exists. As stated earlier, vapor is not a hazard for lead contamination and this Vapor Contingency Plan is included in the event that unknown and unexpected hazardous vapors are encountered. If vapors pose a direct exposure hazard to workers, the following actions may be taken.

- Workers shall leave the impacted Work Area immediately and not return until vapor concentrations decline to safe levels.
- Access to the construction area should be restricted with barriers.
- Monitor the concentrations of volatile contaminants in air.
- Activities requiring active excavation should be planned to include methods for minimizing vapor risks (for example, excavation could be done at night when air temperatures are lower).

7.7 DEBRIS CONTINGENCY PLAN

The Debris Contingency Plan provides guidelines for what should be done when engineering controls, administrative controls, or PPE fail and an imminent risk of exposure to hazardous debris exists. Debris may also require management and/or offsite reuse/recycling/disposal.

The contractor shall manage all debris in a manner that will prevent exposure to project personnel and the public, and cross contamination. Debris may include, but is not limited to, the following:

- Wood
- Asphalt
- Concrete
- Metal
- Glass/Pottery
- Miscellaneous building materials that may include asbestos or lead-based paint.

If hazardous debris is encountered and poses a direct exposure hazard to workers, the following actions may be taken.

- Workers shall leave the impacted Work Area immediately and notify Health & Safety Officer and do not return to the construction area until it has been determined that is safe.
- Access to the construction area should be restricted until it has been determined that it is safe.
- Activities requiring active excavation should be planned to include methods for minimizing disturbance of debris (for example, using alternative means such as geophysical methods to avoid excavating through hazardous debris, or less damaging techniques such as air-knife excavation methods).

7.8 UNANTICIPATED OR UNKNOWN MATERIALS CONTINGENCY PLAN

The Unanticipated or Unknown Materials Contingency Plan provides guidelines for what should be done when engineering controls, administrative controls, or PPE fail and an imminent risk of exposure to unanticipated or unknown materials exists. Previously unknown materials may be encountered during the course of construction and may be hazardous or may be or non-hazardous but still regulated. Unknown materials may also require management and/or offsite reuse/recycling/disposal. This section describes the management of types of unanticipated or unknown materials that may be encountered. The contractor shall manage all unknown materials in a manner that will prevent exposure to project personnel and the public, and cross contamination. Unknown materials may include, but are not limited to, the following:

- Drums
- Unexpected USTs
- Unexpected Pipelines

- Soils or other materials that appear to contain asbestos or petroleum.

If unanticipated or unknown hazardous materials are encountered and they pose a direct exposure hazard to workers, the following actions may be taken.

- Workers shall leave the impacted Work Area immediately and notify the Health and Safety Officer and other response personnel (if necessary).
- Access to the construction area shall be restricted until it has been determined that it is safe.
- Monitor the concentrations of volatile contaminants in air.
- Methods for minimizing disturbance of unanticipated or unknown materials (for example, using alternative means to avoid excavating through such materials such as geophysical clearance or less damaging techniques).

7.9 RECORD KEEPING AND REPORTING

Detailed records of storm events, inspections of engineering controls, and response activities shall be maintained. Significant issues shall be communicated to site workers and the project onsite representative on a regular basis. Reporting requirements shall be followed strictly. Major deviations from this EHE/EHMP should be approved by HDOH prior to implementation. Minor deviations from the EHE/EHMP are acceptable based on field discretion. All deviations should be explained and documented; for your records and HDOH.

8.0 REFERENCES

ASTM, 2013. *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM Designation E1527-13). American Society for Testing and Materials International, Pennsylvania, November 1, 2013.

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USDA, 1972. U.S. Department of Agriculture, Soil Conservation Service, USDA *Soil Survey of Islands of Kauai, Oahu, Molokai and Lanai, State of Hawaii*, August 1972.

USGS United States Geological Survey Map, Honolulu, Quadrangle, at a scale of 1:24,000, Nov. 2016

Ililani LLC

Project Location

Project: 17685-005
Approved: JR
Drawn: RNH
Date: July 2018

Notes:
1. Site boundary modified by MFA. Boundary is based on City & County of Honolulu TMK layer, May 2013 from Honolulu Land Information System (HoLIS) ftp site, ftp://gisftp.hicentral.com/
TMK Layer in project area appears to have significant error. MFA shifted boundary by several ft to conform with aerial imagery. May have margin of error -- boundary should be considered approximate. This does not replace a survey.

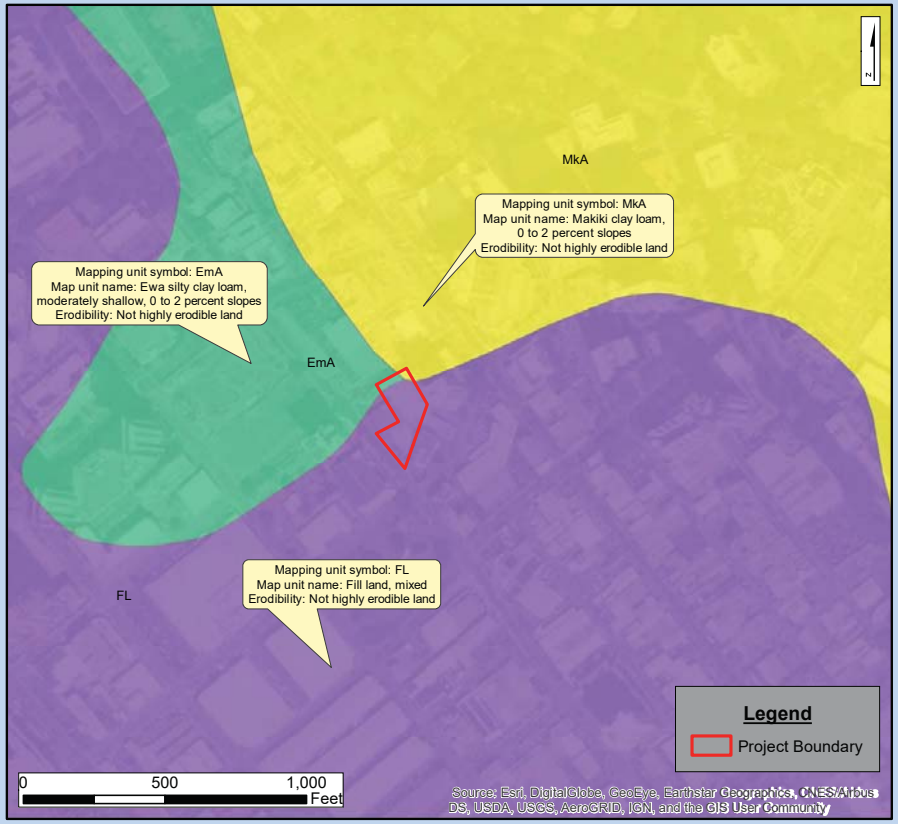
Figure 1

Project Location Map

690 Halekauwila Street
Honolulu, O'ahu, Hawai'i

MASA FUJIOKA & ASSOCIATES
ENVIRONMENTAL • GEOTECHNICAL • HYDROGEOLOGICAL CONSULTANTS

Ililani LLC



Project Location

Project: 17685-005
Approved: JR
Drawn: RNH
Date: July 2018

Notes:
1. Soils data source: USDA Natural Resources Conservation Service (NRCS). 1972. Soils [Statewide GIS layer], with associated Soil Survey Geographic (SSURGO) data. Retrieved May 2009 from Hawaii Statewide GIS Program website, http://hawaii.gov/dbedt/gis/download.htm. Map unit boundaries are only as accurate as the source data; contacts should be considered approximate.
2. No streams are mapped in teh proejct area, from steam layer: Department of Land and Natural Resources (DLNR) Division of Aquatic Resources (DAR). 2004. Retrieved 2009 from Hawaii Statewide GIS Program website: http://hawaii.gov/dbedt/gis/.
3. Project boundary is approximate.

Figure 2

Project Soils Map

690 Halekauwila Street
Honolulu, O'ahu, Hawai'i

MASA FUJIOKA & ASSOCIATES
ENVIRONMENTAL • GEOTECHNICAL • HYDROGEOLOGICAL CONSULTANTS

Ililani LLC

Project Location

Project: 17685-005
Approved: JR
Drawn: RNH
Date: July 2018

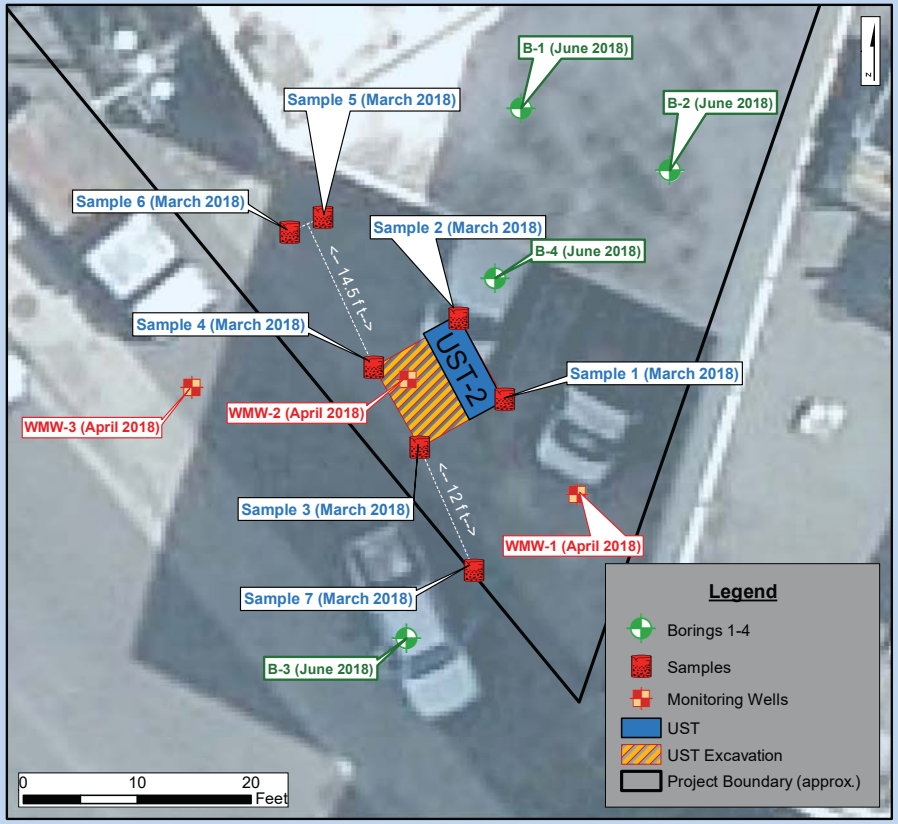
Notes:
1. Site boundary modified by MFA. Boundary is based on City & County of Honolulu TMK layer, May 2013 from Honolulu Land Information System (HoLIS) ftp site, ftp://gisftp.hicentral.com/
TMK Layer in project area appears to have significant error. MFA shifted boundary by several ft to conform with aerial imagery. May have margin of error -- boundary should be considered approximate. This does not replace a survey.
2. Imagry from Pictometry. Image date May 3, 2013.

Figure 3

Sample Location Map

690 Halekauwila Street
Honolulu, O'ahu, Hawai'i

MASA FUJIOKA & ASSOCIATES
ENVIRONMENTAL • GEOTECHNICAL • HYDROGEOLOGICAL CONSULTANTS



Project Location

Project: 17685-005
Approved: JR
Drawn: RNH
Date: July 2018

Notes:
1. Site boundary modified by MFA. Boundary is based on City & County of Honolulu TMK layer, May 2013 from Honolulu Land Information System (HoLIS) ftp site, ftp://gisftp.hicentral.com/
TMK Layer in project area appears to have significant error. MFA shifted boundary by several ft to conform with aerial imagery. May have margin of error -- boundary should be considered approximate. This does not replace a survey.
2. Imagry from Pictometry. Image date May 3, 2013.

Figure 4

Sample Location Map

690 Halekauwila Street
Honolulu, O'ahu, Hawai'i

MASA FUJIOKA & ASSOCIATES
ENVIRONMENTAL • GEOTECHNICAL • HYDROGEOLOGICAL CONSULTANTS

MASA FUJIOKA & ASSOCIATES
Environmental • Geotechnical • Hydrogeological Consultants
98-021 Kamehameha Highway, Suite 337 • Aiea, Hawaii 96701-4914
Telephone: (808) 484-5366 • Facsimile: (808) 484-0007

APPENDIX A

LABORATORY REPORTS

ADVANCED ANALYTICAL LABORATORY INC

January 3, 2018

Masa Fujioka & Associates
98-021 Kamehameha Hwy, #337
Aiea, HI
96701

Dear Joann Romano:

Please find enclosed the analytical report for:

Project Name:	670 Halekauwila St
AAL Project #:	S771
Date Received:	12/20/2017
MIS Prep:	Yes

The results, applicable reporting limits, QA/QC data, invoice, and copy of COC are included.

Advanced Analytical Laboratory appreciates the opportunity to provide analytical services for this project. If you have any questions regarding this project, please don't hesitate to contact AAL.

Thank you for your business and continuing support.

Sincerely,

Uwe Baumgartner, Ph.D
Owner

Elisa M. Young
Owner

3210 Koapaka Street, #A HONOLULU HAWAII 96819
tel (808) 836-2252 fax (808) 836-2250
AAL@hawaii.rr.com

ADVANCED ANALYTICAL LABORATORY INC

AAL Project #S771

Masa Fujioka & Associates

Client Project #: Method: 8015M
Client Project Name: 670 Halekauwila St. Matrix: Soil

CLIENT SAMPLE ID	TPH-DIESEL [mg/kg]	TPH-OIL [mg/kg]	SURROGATE RECOVERY	FLAGS	DATE ANALYZED
Blank	nd	nd	84%		12/20/2017
T-1	nd	nd	82%		12/20/2017
T-2	nd	nd	83%		12/20/2017
PQL	50	100	Acceptable Range		
MDL	20	35	70%-130%		

QA/QC DATA

QC BATCH # 122017	TPH-DIESEL [mg/kg]	TPH-OIL [mg/kg]	Acceptable Range
Lab Control Spike (LCS)	500	499	350-650
Matrix Spike (MS)	499	506	350-650
Matrix Spike Dup (MSD)	496	496	350-650
Recovery LCS	100%	100%	70%-130%
Recovery MS	100%	101%	70%-130%
Recovery MSD	99%	99%	70%-130%
RPD of MS/MSD	0.6%	2.0%	20%

Analyst: U. Baumgartner, Ph.D.
Data review: E. Young

544 Ohohia Street #10 Honolulu Hawaii 96819
TEL (808) 836-2252 FAX (808) 836-2250

ADVANCED ANALYTICAL LABORATORY INC

Advanced Analytical Laboratory
(425) 702-8571

AAL Job Number:	B71228-4
Client:	Advanced Analytical Lab
Project Manager:	Uwe Baumgartner
Client Project Name:	670 Halekuawila St.
Client Project Number:	S771
Date received:	12/28/17

AAL Project #S771

Masa Fujioka & Associates

Client Project #: Method: 8015M
Client Project Name: 670 Halekauwila St. Matrix: Soil

CLIENT SAMPLE ID	TPH-GASOLINE [mg/kg]	SURROGATE RECOVERY	FLAGS	DATE ANALYZED
Blank	nd	99%		12/21/2017
T-1	nd	101%		12/21/2017
T-2	nd	104%		12/21/2017
PQL	5.00	Acceptable Range		
MDL	0.10	70%-130%		

QA/QC DATA

QC BATCH # 122117	TPH-GASOLINE [mg/kg]	Acceptable Range
Lab Control Spike (LCS)	10.8	7.0-13.0
Matrix Spike (MS)	10.7	7.0-13.0
Matrix Spike Dup (MSD)	10.7	7.0-13.0
Recovery LCS	108%	70%-130%
Recovery MS	107%	70%-130%
Recovery MSD	107%	70%-130%
RPD of MS/MSD	0.4%	20%

Analyst: E. Young
Data review: U. Baumgartner, Ph.D.

544 Ohohia Street #10 Honolulu Hawaii 96819
tel (808) 836-2252 fax (808) 836-2250

AAL Job Number: B71228-4
Client: Advanced Analytical Lab
Project Manager: Uwe Baumgartner
Client Project Name: 670 Halekuawila St.
Client Project Number: S771
Date received: 12/28/17

Analytical Results

8260B, µg/kg		MTH BLK	LCS	T-1	T-2	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/28/17	12/28/17	12/28/17	12/28/17	12/28/17	12/28/17	12/28/17
Date analyzed	Limits	12/28/17	12/28/17	12/28/17	12/28/17	12/28/17	12/28/17	12/28/17
MTBE	100	nd		nd	nd			
Dichlorodifluoromethane	50	nd		nd	nd			
Chloromethane	50	nd		nd	nd			
Vinyl chloride	50	nd		nd	nd			
Bromomethane	50	nd		nd	nd			
Chloroethane	50	nd		nd	nd			
Trichlorofluoromethane	50	nd		nd	nd			
1,1-Dichloroethene	50	nd		nd	nd			
Methylene chloride	20	nd		nd	nd			
trans-1,2-Dichloroethene	50	nd		nd	nd			
1,1-Dichloroethane	50	nd		nd	nd			
2,2-Dichloropropane	50	nd		nd	nd			
cis-1,2-Dichloroethene	50	nd		nd	nd			
Chloroform	50	nd		nd	nd			
1,1,1-Trichloroethane	50	nd		nd	nd			
Carbontetrachloride	50	nd		nd	nd			
1,1-Dichloropropene	50	nd		nd	nd			
Benzene	20	nd	85%	nd	nd	122%	114%	7%
1,2-Dichloroethane(EDC)	20	nd		nd	nd			
Trichloroethene	20	nd	110%	nd	nd	105%	121%	14%
1,2-Dichloropropane	50	nd		nd	nd			
Dibromomethane	50	nd		nd	nd			
Bromodichloromethane	50	nd		nd	nd			
cis-1,3-Dichloropropene	50	nd		nd	nd			
Toluene	50	nd	80%	nd	nd	99%	94%	5%
trans-1,3-Dichloropropene	50	nd		nd	nd			
1,1,2-Trichloroethane	50	nd		nd	nd			
Tetrachloroethene	50	nd		nd	nd			
1,3-Dichloropropane	50	nd		nd	nd			
Dibromochloromethane	20	nd		nd	nd			
1,2-Dibromoethane (EDB)*	5	nd		nd	nd			
Chlorobenzene	50	nd	84%	nd	nd	91%	91%	0%
1,1,1,2-Tetrachloroethane	50	nd		nd	nd			
Ethylbenzene	50	nd		nd	nd			
Xylenes	50	nd		nd	nd			
Styrene	50	nd		nd	nd			
Bromoform	50	nd		nd	nd			
Isopropylbenzene	50	nd		nd	nd			
1,2,3-Trichloropropane	50	nd		nd	nd			
Bromobenzene	50	nd		nd	nd			
1,1,2,2-Tetrachloroethane	50	nd		nd	nd			
n-Propylbenzene	50	nd		nd	nd			
2-Chlorotoluene	50	nd		nd	nd			
4-Chlorotoluene	50	nd		nd	nd			
1,3,5-Trimethylbenzene	50	nd		nd	nd			
tert-Butylbenzene	50	nd		nd	nd			
1,2,4-Trimethylbenzene	50	nd		nd	nd			

Advanced Analytical Laboratory
(425) 702-8571

AAL Job Number: B71228-4
Client: Advanced Analytical Lab
Project Manager: Uwe Baumgartner
Client Project Name: 670 Halekuawila St.
Client Project Number: S771
Date received: 12/28/17

Analytical Results

8260B, µg/kg		MTH BLK	LCS	T-1	T-2	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/28/17	12/28/17	12/28/17	12/28/17	12/28/17	12/28/17	12/28/17
Date analyzed	Limits	12/28/17	12/28/17	12/28/17	12/28/17	12/28/17	12/28/17	12/28/17
sec-Butylbenzene	50	nd		nd	nd			
1,3-Dichlorobenzene	50	nd		nd	nd			
Isopropyltoluene	50	nd		nd	nd			
1,4-Dichlorobenzene	50	nd		nd	nd			
1,2-Dichlorobenzene	50	nd		nd	nd			
n-Butylbenzene	50	nd		nd	nd			
1,2-Dibromo-3-Chloropropane	50	nd		nd	nd			
1,2,4-Trichlorobenzene	50	nd		nd	nd			
Hexachloro-1,3-butadiene	50	nd		nd	nd			
Naphthalene	50	nd		nd	nd			
1,2,3-Trichlorobenzene	50	nd		nd	nd			

*-instrument detection limits

Surrogate recoveries

Dibromofluoromethane	116%	114%	115%	121%	102%	117%
Toluene-d8	101%	95%	104%	104%	87%	102%
1,2-Dichloroethane-d4	90%	86%	94%	88%	93%	90%
4-Bromofluorobenzene	93%	94%	113%	103%	115%	102%

Data Qualifiers and Analytical Comments
nd - not detected at listed reporting limits
M - matrix interference
Acceptable Recovery limits: 70% TO 130%

AAL Job Number:	B71228-4
Client:	Advanced Analytical Lab
Project Manager:	Uwe Baumgartner
Client Project Name:	670 Halekuawila St.
Client Project Number:	S771
Date received:	12/28/17

Analytical Results

8270C, mg/kg		MTH BLK	LCS	T-1	T-2	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/29/17	12/29/17	12/29/17	12/29/17	12/29/17	12/29/17	12/29/17
Date analyzed	Limits	12/29/17	12/29/17	12/29/17	12/29/17	12/29/17	12/29/17	12/29/17
Phenol	0.50	nd		nd	nd			
2-Chlorophenol	0.50	nd	93%	nd	nd	93%	93%	0%
1,3-Dichlorobenzene	0.10	nd		nd	nd			
1,4-Dichlorobenzene	0.10	nd	99%	nd	nd	98%	96%	1%
1,2-Dichlorobenzene	0.10	nd		nd	nd			
2-Methylphenol (o-cresol)	0.10	nd		nd	nd			
3,4-Methylphenol (m,p-cresol)	0.10	nd		nd	nd			
Hexachloroethane	0.10	nd		nd	nd			
2-Nitrophenol	0.50	nd		nd	nd			
2,4-Dimethylphenol	0.50	nd		nd	nd			
Bis (2-chloroethoxy) methane	0.10	nd		nd	nd			
2,4-Dichlorophenol	0.50	nd		nd	nd			
1,2,4-Trichlorobenzene	0.10	nd	105%	nd	nd	103%	104%	1%
Naphthalene	0.10	nd		nd	nd			
Hexachlorobutadiene	0.50	nd		nd	nd			
4-Chloro-3-methylphenol	0.50	nd	80%	nd	nd	103%	80%	25%
Hexachlorocyclopentadiene	0.10	nd		nd	nd			
2,4,6-Trichlorophenol	0.50	nd		nd	nd			
2,4,5-Trichlorophenol	0.50	nd		nd	nd			
2-Chloronaphthalene	0.10	nd		nd	nd			
Dimethylphthalate	0.10	nd		nd	nd			
Acenaphthylene	0.10	nd		nd	nd			
Acenaphthene	0.10	nd	103%	nd	nd	104%	103%	1%
2,4-Dinitrophenol	0.50	nd		nd	nd			
4-Nitrophenol	0.50	nd		nd	nd			
2,3,4,6-Tetrachlorophenol	0.10	nd		nd	nd			
Diethylphthalate	0.10	nd		nd	nd			
4-Chlorophenylphenylether	0.50	nd		nd	nd			
Fluorene	0.10	nd		nd	nd			
N-Nitrosodiphenylamine	0.10	nd		nd	nd			
2,4,6-Tribromophenol	0.50	nd		nd	nd			
4-Bromophenylphenylether	0.10	nd		nd	nd			
Hexachlorobenzene	0.10	nd		nd	nd			
Pentachlorophenol	0.50	nd		nd	nd			
Phenanthrene	0.10	nd		nd	nd			
Anthracene	0.10	nd		nd	nd			
Di-n-butylphthalate	0.10	nd		nd	nd			
Fluoranthene	0.10	nd		nd	nd			
Pyrene	0.10	nd	86%	nd	nd	88%	89%	1%
Butylbenzylphthalate	0.50	nd		nd	nd			
Benzo(a)anthracene	0.10	nd		nd	nd			
Chrysene	0.10	nd		nd	nd			
Bis (2-ethylhexyl) ether	0.10	nd		nd	nd			
Di-n-octylphthalate	0.50	nd		nd	nd			
Benzo(b)fluoranthene	0.10	nd		nd	nd			
Benzo(k)fluoranthene	0.10	nd		nd	nd			

AAL Job Number:	B71228-4
Client:	Advanced Analytical Lab
Project Manager:	Uwe Baumgartner
Client Project Name:	670 Halekuawila St.
Client Project Number:	S771
Date received:	12/28/17

Analytical Results

8270C, mg/kg		MTH BLK	LCS	T-1	T-2	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/29/17	12/29/17	12/29/17	12/29/17	12/29/17	12/29/17	12/29/17
Date analyzed	Limits	12/29/17	12/29/17	12/29/17	12/29/17	12/29/17	12/29/17	12/29/17
Benzo(a)pyrene	0.10	nd		nd	nd			
Indeno(1,2,3-cd)pyrene	0.10	nd		nd	nd			
Dibenzo(a,h)anthracene	0.10	nd		nd	nd			
Benzo(ghi)perylene	0.10	nd		nd	nd			
Surrogate recoveries								
Phenol-d6		76%	57%	78%	75%	59%	58%	
Nitrobenzene-d5		80%	72%	80%	79%	70%	70%	
2-Fluorobiphenyl		93%	99%	91%	90%	98%	100%	
2,4,6-Tribromophenol		97%	104%	100%	94%	104%	101%	
4-Terphenyl-d14		127%	135%	142%	145%	136%	136%	

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Results reported on dry-weight basis
Acceptable Recovery limits: 50% TO 150%
Acceptable RPD limit: 30%

ACCU LABORATORY

12524 130th Lane NE
Kirkland WA 98034

Tel: (425) 214-5858
(425) 214-5868
Email: lisa@accu-lab.com
website: www.accu-lab.com

Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**18-AL0102-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	12/18-19/2017
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	1/2/2018
Project Name	**670 Halekauwila St.**	Date Reported	1/3/2018
Client Project#			
Project#	**S771**		

Metals in Soil by EPA 6020B/EPA3050B

Accu Lab Analytical Batch# AL010318-1

Client sample ID					**T-1**	**T-2**	**MS Mokapu-MI-1**	**MSD Mokapu-MI-1**	**RPD Mokapu-MI-1**
Lab ID	**MRL**	**Unit**	**MTH BLK**	**LCS**	18-AL0102-1-1	18-AL0102-1-2	18-AL0102-5-1	18-AL0102-5-1	18-AL0102-5-1
Matrix			Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date Digested			1/3/2018	1/3/2018	1/3/2018	1/3/2018	1/3/2018	1/3/2018	1/3/2018
Date Analyzed			1/3/2018	1/3/2018	1/3/2018	1/3/2018	1/3/2018	1/3/2018	1/3/2018
Arsenic (As)	1.0	mg/Kg	nd	99%	8.2		106%	98%	8%
Barium (Ba)	2.0	mg/Kg	nd	100%	110		81%	99%	20%
Cadmium (Cd)	1.0	mg/Kg	nd	100%	nd		102%	94%	8%
Chromium (Cr)	2.0	mg/Kg	nd	102%	23		M	M	
Lead (Pb)	1.0	mg/Kg	nd	105%	150	1300	92%	96%	4%
Selenium (Se)	1.0	mg/Kg	nd	102%	nd		111%	101%	9%
Silver (Ag)	1.0	mg/Kg	nd	100%	nd		91%	81%	12%
Mercury (Hg)	0.20	mg/Kg	nd	81%	nd		85%	79%	7%

Acceptable Recovery Limits:
LCS 80-120%
MS/MSD 75-125%
Acceptable RPD limit: 20%

This report is issued solely for the use of the person or company to whom it is addressed.
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ACCU LABORATORY

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website: www.accu-lab.com

Analytical Report

Client	Advanced Analytical Laboratory	**Acculab WO#**	**18-AL0102-1**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	12/18-19/2017
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	1/2/2018
Project Name	**670 Halekauwila St.**	Date Reported	1/3/2018
Client Project#			
Project#	**S771**		

Data Qualifiers and Comments:

Results reported on dry-weight basis for soil samples.

MRL- Method Reporting Limit
nd- Indicates the analyte is not detected at the listing reporting limit.
C- Coelution with other compounds.
M- % Recovery of surrogate, MS/MSD is out of the acceptable limit due to matrix effect.
B- Indicates the analyte is detected in the method blank associated with the sample.
J- The analyte is detected at below the reporting limit.
E- The result reported exceeds the calibration range, and is an estimate.
D- Sample required dilution due to matrix. Method Reporting Limits were elevated due to dilutions.
H- Sample was received or analyzed past holding time
Q- Sample was received with head space, improper preserved or above recommended temperature.

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ADVANCED ANALYTICAL LABORATORY-CHAIN OF CUSTODY RECORD

Phone: (808) 836 2252 Fax (808) 836 2250 Address: 544 Ohohia Street#10 Honolulu, HI 96819

TURNAROUND TIME: 5 DAY AAL PROJECT#: 5769

CLIENT: MASA FUJIOKA & ASSOCIATES
ADDRESS: 98-021 KAMEHAMEHA HWY #337, AIEA, HI 96701
PHONE: 808 484 5366 EMAIL: jromano@masafujioka.com dolsen@masafujioka.com
CLIENT PROJECT#:

PROJECT NAME: 670 HALEKAUWILA ST
COLLECTOR: DO
DATE OF COLLECTION: 12/19/17 - 12/19/17
PROJECT MANAGER:

ANALYSES

Sample Number	Time	Sample type	Container Type	Multi-Incremental Volatile	8015M TPH Gasoline	8015M TPH Fuel Scan	8015M TPH Diesel	8015M TPH Oil	8260B Volatiles	8021B MBE	8270 PAH DOH 4	8270 PAH 17 Volatiles	8082 PCB	TCLP 8081 Organochlorine Pesticides	8081 Organochlorine Pesticides	Total Lead	TCLP Cadmium	Total RCRA 8 Metals	Total RCRA 8 Metals	Field Notes	Total Number of Containers	Total Number received
T-1	1630	MI SOIL	BAG 2 AMBER	X	X	X	X	X			X	X						X			2	
T-2	1500	MI SOIL	BAG 2 AMBER	X	X	X	X	X			X	X				X					2	

RELINQUISHED BY (Signature): DATE/TIME: 12/20/17 0920 RECEIVED BY (Signature): DATE/TIME: 12/20/17 9:30

RELINQUISHED BY (Signature): DATE/TIME: RECEIVED BY (Signature): DATE/TIME:

SAMPLE RECEIPT
TOTAL NUMBER OF CONTAINERS: 4
CHAIN OF CUSTODY SEALS INTACT: Y
RECEIVED IN GOOD CONDITION: Y
TEMPERATURE: 3.1°C
PAGE 1 OF 1

LABORATORY NOTES:

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Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**18-AL0314-5**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	3/13/2018
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	3/14/2018
Project Name	**Halekawila**	Date Reported	3/15/2018
Client Project#			
Project#	**T147**		

Metals in Soil by EPA 6020B/EPA3050B

Accu Lab Analytical Batch# AL031418-4

Client sample ID					**5-NW-4**	**6-SW-3**	**7-S-4.5**
Lab ID	**MRL**	**Unit**	**MTH BLK**	**LCS**	18-AL0314-5-5	18-AL0314-5-6	18-AL0314-5-7
Matrix			Soil	Soil	Soil	Soil	Soil
Date Digested			3/14/2018	3/14/2018	3/14/2018	3/14/2018	3/14/2018
Date Analyzed			3/14/2018	3/14/2018	3/14/2018	3/14/2018	3/14/2018
Moisture (%)					13%	15%	19%
Lead (Pb)	1.0	mg/Kg	nd	99%	86	240	1100

Acceptable Recovery Limits:
LCS 80-120%
MS/MSD 75-125%
Acceptable RPD limit: 20%

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Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**18-AL0314-5**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	3/13/2018
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	3/14/2018
Project Name	**Halekawila**	Date Reported	3/15/2018
Client Project#			
Project#	**T147**		

Metals in Soil by EPA 6020B/EPA3050B

Accu Lab Analytical Batch# AL031418-4

Client sample ID	**MRL**	**Unit**	**MS 299030-40-SOIL**	**MS 299030-40-SOIL**	**RPD 299030-40-SOIL**
Lab ID			18-AL0314-1-1	18-AL0314-1-1	18-AL0314-1-1
Matrix			Soil	Soil	Soil
Date Digested			3/14/2018	3/14/2018	3/14/2018
Date Analyzed			3/14/2018	3/14/2018	3/14/2018
Moisture (%)					
Lead (Pb)	1.0	mg/Kg	M	M	

Acceptable Recovery Limits:
LCS 80-120%
MS/MSD 75-125%
Acceptable RPD limit: 20%

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Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**18-AL0314-5**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	3/13/2018
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	3/14/2018
Project Name	**Halekawila**	Date Reported	3/15/2018
Client Project#			
Project#	**T147**		

Metals in Soil TCLP by EPA 6020B/EPA 3010A/EPA1311

Accu Lab Analytical Batch# AL031418-5

Client sample ID	**MRL**	**Unit**	**MTH BLK**	**LCS**	**TCLP 1-E-4**	**TCLP 2-N-5**	**TCLP 3-S-5**	**TCLP 4-W-5**
Lab ID			18-AL0314-5-1	18-AL0314-5-2	18-AL0314-5-3	18-AL0314-5-4		
Matrix			TCLP Extract	TCLP Extract	TCLP Extract	TCLP Extract	TCLP Extract	TCLP Extract
Date Extracted			3/14/2018	3/14/2018	3/14/2018	3/14/2018	3/14/2018	3/14/2018
Date Analyzed			3/15/2018	3/15/2018	3/15/2018	3/15/2018	3/15/2018	3/15/2018
Lead (Pb)	0.05	mg/L	nd	102%	nd	nd	nd	nd

Acceptable Recovery Limits:
LCS 80-120%
MS/MSD 75-125%
Acceptable RPD limit: 20%

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Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**18-AL0314-5**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	3/13/2018
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	3/14/2018
Project Name	**Halekawila**	Date Reported	3/15/2018
Client Project#			
Project#	**T147**		

Metals in Soil TCLP by EPA 6020B/EPA 3010A/EPA1311

Accu Lab Analytical Batch# AL031418-5

Client sample ID	**MRL**	**Unit**	**TCLP 5-NW-4**	**TCLP 6-SW-3**	**TCLP 7-S-4.5**	**MS TCLP DU113-01**	**MSD TCLP DU113-01**	**RPD TCLP DU113-01**
Lab ID			18-AL0314-5-5	18-AL0314-5-5	18-AL0314-5-5	18-AL0314-1-2	18-AL0314-1-2	18-AL0314-1-2
Matrix			TCLP Extract	TCLP Extract	TCLP Extract	TCLP Extract	TCLP Extract	TCLP Extract
Date Extracted			3/14/2018	3/14/2018	3/14/2018	3/14/2018	3/14/2018	3/14/2018
Date Analyzed			3/15/2018	3/15/2018	3/15/2018	3/15/2018	3/15/2018	3/15/2018
Lead (Pb)	0.05	mg/L	nd	0.08	0.30	100%	100%	0.2%

Acceptable Recovery Limits:
LCS 80-120%
MS/MSD 75-125%
Acceptable RPD limit: 20%

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Analytical Report

Client	Advanced Analytical Laboratory	**Acculab WO#**	**18-AL0314-5**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	3/13/2018
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	3/14/2018
Project Name	**Halekawila**	Date Reported	3/15/2018
Client Project#			
Project#	**T147**		

Data Qualifiers and Comments:

Results reported on dry-weight basis for soil samples.

MRL- Method Reporting Limit
nd- Indicates the analyte is not detected at the listing reporting limit.
C- Coelution with other compounds.
M- % Recovery of surrogate, MS/MSD is out of the acceptable limit due to matrix effect.
B- Indicates the analyte is detected in the method blank associated with the sample.
J- The analyte is detected at below the reporting limit.
E- The result reported exceeds the calibration range, and is an estimate.
D- Sample required dilution due to matrix. Method Reporting Limits were elevated due to dilutions.
H- Sample was received or analyzed past holding time
Q- Sample was received with head space, improper preserved or above recommended temperature.

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ADVANCED ANALYTICAL LABORATORY-CHAIN OF CUSTODY RECORD

Phone: (808) 836 2252 Fax:(808) 836 2250 Address: 544 Ohohia St., unit 10 Honolulu, HI 96819

TURNAROUND TIME: 24 Hour. AAL PROJECT#: T147

CLIENT: Masa Fujioka + Assoc.
ADDRESS: AIEA
PHONE: 808 484-5366 EMAIL: Thomas@masa-fujioka.com
CLIENT PROJECT#:

PROJECT NAME: Halekauwila
COLLECTOR: Tuan R
DATE OF COLLECTION: 3-13-18
PROJECT MANAGER: T. Ano

RUSH!

ANALYSES

Sample Number	Time	Sample type	Container Type	Multi Incremental Volatile	Multi Incremental Non Volatile	8015M TPH Fuel Scan	8015M TPH Gasoline	8015M TPH Diesel	8015M TPH Oil	8260B Volatiles	8021B BTEX	8260 BTEX	8100 PAH DOH 4	8270 PAH 17 analytes	8270 Semi Volatiles	8082 PCB	TCLP 8081 Organochlorine Pesticides	8081 Organochlorine Pesticides	8081 Technical Chlordane	Total Lead	Total Cadmium	TCLP RCRA 8 Metals Lead	Total RCRA 8 Metals	Field Notes	Number of containers	Number containers received
1-E-4	9:15	S.1	4 Jars																		X			RUSH	1	1
2-N-5	9:20																				X				1	1
3-S-5	9:30																				X				1	1
4-W-5	9:55																				X				1	1
5-NW-4	10:20																		X		X				1	1
6-SW-3	10:35																		X		X				1	1
7-S 4.5	11:30																		X		X				1	1

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
	3-13-18	11:48	
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
			3-13-18 1150

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	7
CHAIN OF CUSTODY SEALS INTACT	NA
RECEIVED IN GOOD CONDITION	YES
TEMPERATURE	5.3°C
PAGE 1 OF _	

LABORATORY NOTES:

EHE/EHMP
690 Halekauwila Street, Honolulu, HI

HDOH Tier 1 Evaluations for Lead

APPENDIX B

MASA FUJIOKA & ASSOCIATES
Environmental • Geotechnical • Hydrogeological Consultants
98-021 Kamehameha Highway, Suite 337 • Aiea, Hawaii 96701-4914
Telephone: (808) 484-5366 • Facsimile: (808) 484-0007

Environmental Action Levels Surfer
Hawai'i DOH (Fall 2017)

Worksheet is write protected. Disable protection using "Unprotect" under "Review" if you have trouble selecting options (password = EAL).
Steps 1 and 2:
Click in cell and use pull-down boxes to make selection.

LEAD

STEP 1: Select [1]Site Scenario:

[2]Land Use:	Unrestricted
[3]Groundwater Utility:	Drinking Water Resource
[4]Distance To Nearest Surface Water Body:	>150m

Final EALs

Soil (mg/kg):	2.0E+02 X
Groundwater (ug/L):	1.5E+01
Soil Vapor (ug/m^3):	-

STEP 2: [5]Select Contaminant

Chemical Name or CAS #?	Chemical Name

LEAD

EALs exceeded. Refer to Detailed EALs (next tab) to identify specific environmental hazards that may be posed by contamination.

STEP 3 (optional): Enter site data.
(Potential environmental hazards highlighted in Red on Detailed EAL worksheet.)

Soil (mg/kg):	1300
Groundwater (ug/L):	
Soil Vapor (ug/m^3):	

Notes

Naturally occurring metal. Action levels for leaching of metals from soil and subsequent contamination of groundwater not developed. Batch tests and/or groundwater monitoring recommended if soil background exceeded (see Advanced EHE Options tab of Surfer).

Reference:
HDOH 2017, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017): Hawai'i Department of Health, Hazard Evaluation and Emergency Response, http://hawaii.gov/health/environmental/hazard/index.html

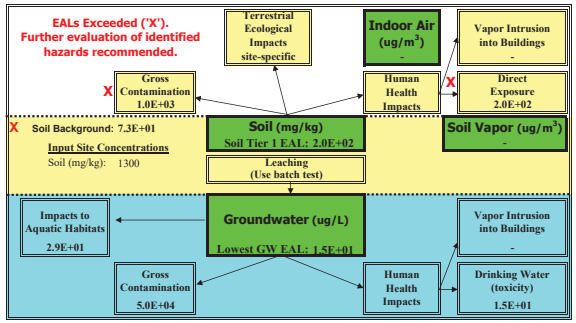
Notes:
1. Site scenario options based on scenarios used to develop EAL lookup tables (HDOH 2017). "Tier 1" EALs presented in summary lookup tables based on unrestricted land use scenario within 150m of a surface water body and over groundwater that is a use of drinking water.
2. "Unrestricted" land use category suitable for residential housing, schools, day care, medical facilities, parks and similar sensitive uses. Use to evaluate the need for future land use restrictions. Screen using a commercial/industrial land use scenario if site is to be used only for these purposes and contamination will not be cleaned up to meet action levels (or acceptable alternatives) for unrestricted land use. Future land-use restrictions may apply (refer to Chapter 5 of Volume 1).
3. See Section 2.4 of Volume 1 for determination of groundwater utility.
4. Used to evaluate potential impacts to aquatic habitats. Chronic aquatic toxicity goals used to
5. Cyanide EALs based on CN- (57-12-5); mercury EALs based on mercuric salts (7487-94-7), PCB EALs based on Arochlor 1254 (11097-69-1).
6. Refer to Volume 1, Section 2.11 for guidance on chemicals not listed in Tier 1 EALs or EAL

See also attached Detailed EALs, Surfer Report, Chemical Summary worksheet, Advanced EHE Options and Glossary.

Tier 1 Environmental Action Levels Surfer
(Screening Levels For Specific Environmental Hazards)

Hawai'i DOH (Fall 2017)

LEAD



Selected Site Scenario	
Land Use:	Unrestricted
Groundwater Utility:	Drinking Water Resource
Distance to Surface Water:	>150m

HDOH 2017, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017): Hawai'i Department of Health, Hazard Evaluation and Emergency Response, http://hawaii.gov/health/environmental/hazard/index.html

Site Scenarios: Site scenario options based on scenarios used to develop EAL lookup tables.
Soil Eco-Risk: Site specific, ecological risk assessment recommended at sites where anthropogenic contamination identified and sensitive, terrestrial ecological habitats could be threatened (see Volume 1 Section 4.2).
See also attached Tier 1 EAL Summary Report, Chemical Summary, Glossary and Advanced EHE Overview.

[1]Tier 1 EAL SURFER SUMMARY REPORT
Hawai'i DOH (Fall 2017)

Site Name:	WONGS PRODUCE
Site Address:	690 Halekauwila Str Honolulu, HI
Site ID Number:	
Date of EAL Search:	Jan 5 2018

Selected Site Scenario	
Land Use:	Unrestricted
Groundwater Utility:	Drinking Water Resource
Distance To Nearest Surface Water Body:	>150m

Selected Chemical of Concern:	**LEAD**

Input Site Concentrations	
Soil (mg/kg):	1300
Groundwater (ug/L):	-
Soil Vapor (ug/m^3):	-

Soil Environmental Hazards	Units	Tier 1 Action Level	[2]Potential Hazard?	[3]Referenced Table
Direct Exposure:	mg/kg	2.0E+02	Yes	Table I-1
Vapor Emissions To Indoor Air:	mg/kg	-	-	Table C-1b
Terrestrial Ecotoxicity:	mg/kg	site-specific	No	Table L
Gross Contamination:	mg/kg	1.0E+03	Yes	Table F-2
Leaching (threat to groundwater):	mg/kg	(Use batch test)	-	Table E-1
Background:	mg/kg	7.3E+01		
Final Soil Tier 1 EAL:	**mg/kg**	**2.0E+02**		
	Basis:	**Direct Exposure**		

Groundwater Environmental Hazards	Units	Tier 1 Action Level	[2]Potential Hazard?	[3]Referenced Table
Drinking Water (Toxicity):	ug/L	1.5E+01	-	Table D-1b
Vapor Emissions To Indoor Air:	ug/L	-	-	Table C-1a
Aquatic Ecotoxicity:	ug/L	2.9E+01	-	Table D-4a
Gross Contamination:	ug/L	5.0E+04	-	Table G-1
Final Groundwater Tier 1 EAL:	**ug/L**	**1.5E+01**		
	Basis:	**Drinking Water Toxicity**		

Other Tier 1 EALs:	Units	EAL	[2]Potential Hazard?	[3]Referenced Table
Shallow Soil Vapor:	ug/m^3	-	-	Table C-2
Indoor Air:	ug/m^3	-	-	Table C-3

Notes:

1. Include Surfer Summary Report in appendices of *Environmental Hazard Evaluation* (EHE) for contaminants that exceed Tier 1 EALs (refer to Chapter 3 of main text).
2. Environmental hazard could exist of concentration of contaminant exceeds action level.
3. Referenced tables presented in Appendix 1 of EHE guidance document.

HDOH 2017, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2017): Hawai'i Department of Health, Hazard Evaluation and Emergency Response, http://hawaii.gov/health/environmental/hazard/index.html

TABLE F-2. GROSS CONTAMINATION ACTION LEVELS FOR [1]EXPOSED OR POTENTIALLY EXPOSED

CONTAMINANT	[2]Final Unrestricted Land Use Action Level	Final Industrial/ Commercial Land Use Action Level	[2]Raw Unrestricted Action Level	Raw Industrial/ Commercial Action Level	Soil Saturation Limit (mg/kg)	Vapor Pressure (VP) (Torr @ 20-30 °C)	Percentile Odor Recognition Threshold (ORT) (ug/m^3)	Percentile Odor Recognition Threshold (ORT) (ppm-v)	Odor Index
FLUORENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	3.2E-04	-	-	-
GLYPHOSATE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	4.30E-10	-	-	-
HEPTACHLOR	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	3.0E-04	3.00E+02	2.00E-02	1.50E-02
HEPTACHLOR EPOXIDE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.6E-06	3.00E+02	1.90E-02	1.37E-04
HEXACHLOROBENZENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.1E-05	-	-	-
HEXACHLOROBUTADIENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.50E-01	1.20E+04	1.10E+00	1.36E-01
HEXACHLOROCYCLOHEXANE (c	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	9.4E-06	-	-	-
HEXACHLOROETHANE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.1E-01	-	-	-
HEXAZINONE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.25E-07	-	-	-
INDENO(1,2,3-cd)PYRENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.0E-06	-	-	-
ISOPHORONE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	4.38E-01	-	-	-
LEAD	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
MERCURY	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.0E-03	-	-	-
METHOXYCHLOR	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.4E-06	-	-	-
METHYL ETHYL KETONE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	2.8E+04	1.00E+02	3.20E+04	1.10E+01	9.09E+00
METHYL ISOBUTYL KETONE	1.0E+02	5.0E+02	1.0E+02	5.0E+02	3.4E+03	1.00E+01	4.20E+02	1.00E-01	1.00E+02
METHYL MERCURY	1.0E+02	5.0E+02	1.0E+02	5.0E+02	NA	-	-	-	-
METHYL TERT BUTYL ETHER	1.0E+02	5.0E+02	1.0E+02	5.0E+02	8.9E+03	2.45E+02	5.30E+02	1.30E-01	1.88E+03
METHYLENE CHLORIDE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	3.3E+03	4.29E+02	5.60E+05	1.60E+02	2.68E+00
METHYLNAPHTHALENE, 1-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	6.8E-02	6.80E+01	1.15E-02	5.91E+00
METHYLNAPHTHALENE, 2-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	6.8E-02	6.80E+01	1.15E-02	5.91E+00
MOLYBDENUM	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
NAPHTHALENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	8.2E-02	4.40E+02	8.40E-02	9.76E-01
NICKEL	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
NITROBENZENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	3.0E+03	2.45E-01	-	-	-
NITROGLYCERIN	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	4.00E-02	-	-	-
NITROTOLUENE, 2-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.09E-01	-	-	-

TABLE F-3. GROSS CONTAMINATION ACTION LEVELS FOR [1]DEEP OR OTHERWISE ISOLATED SOILS (mg/kg)

CONTAMINANT	[2]Final Unrestricted Land Use Action Level	Final Industrial/ Commercial Land Use Action Level	[2]Raw Unrestricted Action Level	Raw Industrial/ Commercial Action Level	Soil Saturation Limit (mg/kg)	Vapor Pressure (VP) (Torr @ 20-30 °C)	Percentile Odor Recognition Threshold (ORT) (ug/m^3)	Percentile Odor Recognition Threshold (ORT) (ppm-v)	Odor Index
DICHLOROETHANE, 1,1-	1.0E+03	1.7E+03	1.0E+03	2.5E+03	1.7E+03	2.34E+02	1.25E+05	3.00E+01	7.80E+00
DICHLOROETHANE, 1,2-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	3.0E+03	7.90E+01	2.42E+03	5.90E-01	1.34E+02
GLYPHOSATE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	4.30E-10	-	-	-
HEPTACHLOR	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	3.00E-04	3.00E+02	2.00E-02	1.50E-02
HEPTACHLOR EPOXIDE	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	2.60E-06	3.00E+02	1.90E-02	1.37E-04
HEXACHLOROBENZENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.10E-05	-	-	-
HEXACHLOROBUTADIENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.50E-01	1.20E+04	1.10E+00	1.36E-01
HEXACHLOROCYCLOHEXANE (	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	9.40E-06	-	-	-
HEXACHLOROETHANE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.10E-01	-	-	-
HEXAZINONE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.25E-07	-	-	-
INDENO(1,2,3-cd)PYRENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.00E-06	-	-	-
ISOPHORONE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	4.38E-01	-	-	-
LEAD	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
MERCURY	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.00E-03	-	-	-
METHOXYCHLOR	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.40E-06	-	-	-
METHYL ETHYL KETONE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	2.8E+04	1.00E+02	3.20E+04	1.10E+01	9.09E+00
METHYL ISOBUTYL KETONE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	3.4E+03	1.00E+01	4.20E+02	1.00E-01	1.00E+02
METHYL MERCURY	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	-	-	-	-
METHYL TERT BUTYL ETHER	5.0E+02	1.0E+03	5.0E+02	1.0E+03	8.9E+03	2.45E+02	5.30E+02	1.30E-01	1.88E+03
METHYLENE CHLORIDE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	3.3E+03	4.29E+02	5.60E+05	1.60E+02	2.68E+00
METHYLNAPHTHALENE, 1-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.80E-02	6.80E+01	1.15E-02	5.91E+00
METHYLNAPHTHALENE, 2-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.80E-02	6.80E+01	1.15E-02	5.91E+00
MOLYBDENUM	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
NAPHTHALENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	8.20E-02	4.40E+02	8.40E-02	9.76E-01
NICKEL	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
NITROBENZENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	3.0E+03	2.45E-01	-	-	-

TABLE I-1. DIRECT-EXPOSURE ACTION LEVELS [1]UNRESTRICTED LAND USE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[2]Carcinogens (mg/kg)	[2]Mutagens (mg/kg)	Noncarcinogens (Final) (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
DINITROTOLUENE, 2,4- (2,4-DI	1.7E+00	carcinogenic effects	1.7E+00		2.5E+01	1.3E+02	NA
DINITROTOLUENE, 2,6- (2,6-DI	3.5E-01	carcinogenic effects	3.5E-01		3.8E+00	1.9E+01	NA
DIOXANE, 1,4-	5.3E+00	carcinogenic effects	5.3E+00		1.7E+02	8.5E+02	1.2E+05
DIOXINS (TEQ)	2.4E-04	HDOH 2010a					
DIURON	2.5E+01	noncarcinogenic effects			2.5E+01	1.3E+02	NA
ENDOSULFAN	9.4E+01	noncarcinogenic effects			9.4E+01	4.7E+02	NA
ENDRIN	3.8E+00	noncarcinogenic effects			3.8E+00	1.9E+01	NA
ETHANOL		not available					
ETHYLBENZENE	6.2E+01	carcinogenic effects	6.2E+01		7.1E+02	3.5E+03	4.8E+02
FLUORANTHENE	4.8E+02	noncarcinogenic effects			4.8E+02	2.4E+03	NA
FLUORENE	4.6E+02	noncarcinogenic effects			4.6E+02	2.3E+03	NA
GLYPHOSATE	1.3E+03	noncarcinogenic effects			1.3E+03	6.3E+03	NA
HEPTACHLOR	1.3E+00	carcinogenic effects	1.3E+00		7.8E+00	3.9E+01	NA
HEPTACHLOR EPOXIDE	2.0E-01	noncarcinogenic effects	6.9E-01		2.0E-01	1.0E+00	NA
HEXACHLOROBENZENE	2.2E-01	carcinogenic effects	2.2E-01		1.3E+01	6.3E+01	NA
HEXACHLOROBUTADIENE	1.3E+00	carcinogenic effects	1.3E+00		1.6E+01	7.8E+01	NA
HEXACHLOROCYCLOHEXANE	5.5E-01	carcinogenic effects	5.5E-01		4.3E+00	2.1E+01	NA
HEXACHLOROETHANE	2.0E+00	carcinogenic effects	2.0E+00		9.1E+00	4.6E+01	NA
HEXAZINONE	4.2E+02	noncarcinogenic effects			4.2E+02	2.1E+03	NA
INDENO(1,2,3-cd)PYRENE	1.1E+01	mutagenic effects	4.9E+01	1.1E+01			NA
ISOPHORONE	5.5E+02	carcinogenic effects	5.5E+02		2.5E+03	1.3E+04	NA
LEAD	2.0E+02	noncarcinogenic effects			2.0E+02		NA
MERCURY	4.7E+00	noncarcinogenic effects			4.7E+00	2.3E+01	NA
METHOXYCHLOR	6.3E+01	noncarcinogenic effects			6.3E+01	3.2E+02	NA
METHYL ETHYL KETONE	5.6E+03	noncarcinogenic effects			5.6E+03	2.8E+04	2.8E+04
METHYL ISOBUTYL KETONE	3.4E+03	saturation limit			7.2E+03	3.6E+04	3.4E+03
METHYL MERCURY	1.6E+00	noncarcinogenic effects			1.6E+00	7.8E+00	NA
METHYL TERT BUTYL ETHER	5.0E+01	carcinogenic effects	5.0E+01		3.3E+03	1.7E+04	8.9E+03

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APPENDIX C

FACT SHEETS FOR LEAD

HAWAII STATE DEPARTMENT OF HEALTH

The **Hazard Evaluation and Emergency Response Office** (HEER Office) is part of the Hawai'i Department of Health Environmental Health Administration whose mission is to protect human health and the environment. The HEER Office provides leadership, support, and partnership in preventing, planning for, responding to, and enforcing environmental laws relating to releases or threats of releases of hazardous substances.

Lead in Hawaiian Soils: Questions and Answers

This fact sheet provides landowners, private citizens, farmers, developers, realtors, and others with an overview of the potential human health concerns associated with lead in soils in Hawaiʻi. Additionally, this fact sheet discusses methods for reducing exposure to lead and provides resources for further information.

What is lead and how does it get in the soil?

Lead is a naturally occurring element that occurs in all soils, including Hawaiian soils, at low levels. Natural background levels of lead in soils are typically 10 to 75 mg/kg (milligrams of lead per kilogram of soil) but elevations in the range of 100-200 mg/kg, levels still considered below a significant long-term health hazard risk, can be found in isolated cases due to additional inputs from historic human activity. Higher lead levels in soils (e.g. >200 mg/kg) may be present from a variety of pollution sources related to historic or current human activities. Exposure to very high levels of lead can be toxic to humans and animals, causing serious health effects. Most childhood exposures to lead can be traced to lead-based paint or lead in batteries, jewelry, and other household items. Exposure to lead in soil can also be important, however.

Lead shot at a firing range. There are several sources of human-caused lead contamination that affect Hawaiʻi's soil and groundwater.

There are two main human-caused sources of lead in soils: the past use of lead-based paint in homes and the past use of leaded gasoline. Although lead in gasoline was phased out starting in the 1970s, years of leaded gasoline use means the soils adjacent to highways and roads have elevated lead levels. Studies in urban areas have shown that soil lead levels are highest around building foundations and within a few feet of busy streets. Lead from leaded gasoline is also found in soils affected by past releases from storage tanks and pipelines at gas station sites. Other human-caused sources of lead in soil include pipes and plumbing materials, roofing nails, and batteries. Some industrial sources of lead contaminate the soil as well. Lead shot at former and active firing ranges, scrap metal yards, and ash from burning lead-bearing wastes like painted wood and batteries can all contribute to lead contamination in soils. When lead is released to the air from industrial sources or vehicles, it may travel long distances attached to fine particles before settling to the ground, where it mixes with soil particles. Lead does not biodegrade in soils, but can be dispersed through natural or human soil disturbances over time or could be transported by erosion to adjacent areas.

The State of Hawai'i Department of Health's (HDOH) Hazard Evaluation and Emergency Response Office (HEER Office) is responsible for responding to releases of lead and other hazardous substances into the soil or groundwater, and overseeing cleanup efforts. Other state and federal agencies have complementary roles in helping to prevent and address lead contamination and exposure. Additional information for these other resources are included at the end of this fact sheet.

How are people exposed to lead in the soil?

Ingesting the soil is the primary source of exposure to lead in soil. Lead can also be inhaled with very fine soil particles during outdoor tasks (e.g. dust from yard work or construction work) or carried into houses as airborne dust, or on shoes, clothing, and pets where it gets on floors or other objects that residents then come in contact with.

Children are at risk of lead exposure from unintentional ingestion of soil through normal play activities.

Lead was added to paint as early as the Medieval ages to speed up drying and increase durability. The use of lead in house paint was banned by 1978 but it still exists in the interior and/or exterior paint of many older homes in Hawai'i. As a result, real estate sales must disclose the potential presence of lead based paint on buildings built before 1978. As the paint chips off, it falls to the ground where the lead-contaminated chips persist in the soil near the foundation. In addition, some older type roofing nails contain lead. Roofing nails have wide, flat heads and short shanks. Similar to the paint chips, as the roofing nails fall off and land adjacent to the foundation, lead can be leached from the nails and mix with soil.

Lead-based paint is still present in many homes in Hawai'i. Children are at risk from eating paint chips and flakes. The paint chips can also fall off the house exterior and get in the soil adjacent to the foundation where children may play.

People, and especially young children, may unintentionally swallow very small amounts of lead-contaminated soil through gardening or other normal outdoor work or play activities. Children frequently put their hands, toys, or other objects in their mouths, and these can often have small amounts of soil and dust on them that the child then swallows.

Exposure to lead can also result from eating produce grown in gardens with elevated soil lead levels, such as gardens near building foundations where deteriorated lead-paint may be present or gardens adjacent to busy roadways. In general, plants do not absorb or accumulate lead. A greater concern is the accidental ingestion of lead in soil or dust particles found on unwashed produce. Thorough washing of produce is especially important for root crops such as taro, carrots or sweet potatoes and leafy vegetables like fern heads, kale and lettuce due to the tendency of soil particles or dust to adhere to the surface of this produce.

What are the human health concerns of lead exposure?

Lead can be particularly harmful to pregnant women and young children. According to the U.S. Centers for Disease Control (CDC) lead poisoning is the most common and serious "environmental" disease affecting children. Children's bodies absorb more lead than adults do and their brains and nervous systems are more sensitive to the damaging effects of lead.

Lead can affect most every organ and system in the human body. Ingestion of large amounts of lead can cause seizures, coma and even death. Adults exposed to high levels of lead have had health symptoms that include: cardiovascular problems, increased blood pressure and incidence of hypertension; decreased kidney function; and reproductive problems (in both men and women).

Significant lead exposure to young children is typically traced to lead-based paint, batteries, jewelry, or other household articles rather than lead in soil. Exposure of children to even low levels of lead has been shown to result in behavior and learning problems, lower IQ and hyperactivity, slowed growth, hearing problems, insomnia, and anemia. Once absorbed by the human body, lead is difficult to remove. Consequently, limiting exposure to lead wherever possible is recommended.

How can I test to see if I have been exposed to lead?

If you have evidence or documentation of lead contaminated soils on your property (i.e. soils that exceed the state lead action levels) or if you think you or a family member may be experiencing symptoms of lead poisoning, you can contact your physician or local health department for information on blood lead testing. Any lead exposure testing should be recommended and conducted by a doctor or trained medical professional. A simple blood test is available to measure lead levels. Testing can determine if the level of lead in the body is higher or lower than the average person. The U.S. Center for Disease Control has updated its recommendations on children's blood lead level of concern for young children to 5 micrograms per deciliter of lead in the blood. The testing cannot determine the origin of the lead (for example soil or food) or whether the lead levels in the body will affect the person's health.

When should testing for soil lead be conducted?

This picture shows soil sample collection from a small garden. Gardens grown near house foundations or near busy roadways have the potential for elevated soil lead concentrations.

Residential or commercial buildings that were built before 1978 or are located near busy roadways may potentially have elevated lead in soil surrounding the foundation area or in soil near the busy roadway due to former use of lead-based paint on the structures or the former use of lead-containing gasoline by vehicles. If you suspect elevated levels of lead in your soil, you may want to have the soil tested. You can hire an environmental professional to conduct testing, or call the HEER Office for advice on sampling and laboratory analysis of any samples collected.

Lead in soil may be very unevenly distributed and therefore, a "Multi Increment" sampling approach for soil lead testing is advised. Multi Increment samples are typically large (weighing between 500-2,000 grams, or filling at least one-half of a gallon-size plastic bag) as each sample is made by combining many small soil increments that are collected from the area of interest. Lead tends to accumulate in the upper few inches of soil and does not move to any great extent in soils unless the soil has been disturbed by activities such as excavation for building or

tillage for landscaping and gardening (a low soil pH may also enhance the mobility of lead). Surface soil samples are typically collected using a small diameter (approximately 1 inch) hand-coring tool from the ground surface down to about 2 to 6 inches in depth, targeting the surface soil depth where exposure may be most likely for you or your family.

Soil testing is the only option to know for certain if levels are elevated, to what extent, and to what depth. Laboratories in Hawai'i that have facilities to analyze soils for lead content can be found in internet directories or in the phone book under "Environmental Analysis Laboratories" or "Analytical Laboratories". Laboratories should be contacted to confirm the services provided and to coordinate on sample collection and delivery details. Laboratories should dry and sieve the Multi Increment sample(s) they receive to analyze the ≤ 2 millimeter (mm) particle size soil fraction for total lead content.

How are soil lead testing data evaluated?

A professional environmental consultant can be hired or the HEER Office can be consulted for questions regarding the evaluation of your data and to provide recommendations. The HEER Office has established environmental action levels or standards for lead in soil. Total lead in soil concentrations should not exceed 200 mg/kg for residential properties and 800 mg/kg for commercial and industrial properties. The HEER Office environmental action levels were developed taking into consideration potential health risk determinations based on predicted bioaccessible lead levels. Bioaccessible lead levels take into account only the estimated proportion of total lead that will be absorbed in the digestive system and potentially contribute to human health risks (a portion of the lead stays tightly bound to soil particles and will not be absorbed).

If soil results show estimated total lead levels are above 200 mg/kg, young children and pregnant women should avoid contact with the bare soil. Cleanup actions may be warranted for residential properties where soil lead levels exceed 200 mg/kg. Total lead levels above 800 mg/kg are considered a potential concern even for commercial or industrial uses of a property, and warrants action to further evaluate lead levels in soil or evaluate and pursue cleanup options. Contact the HDOH HEER Office if testing indicates soil lead levels are above the applicable environmental action levels, and for specific advice on lead control or removal measures that should be taken.

How can I remove lead from the soil?

Currently, the best ways of dealing with high lead soils are to (1) if feasible, eliminate the lead exposure risk by physically removing the contaminated soil to an approved landfill, or (2) covering the lead-containing soils with clean soils. An additional potential method of reducing the hazard of lead in soils is geochemical fixation. Geochemical fixation uses a non-toxic chemical mixed into the contaminated soil to convert the potentially toxic form of lead into a compound less likely to be absorbed by the body if accidentally ingested or inhaled. Soil removal or remediation actions at sites where lead in soil exceeds HEER Office environmental action levels should be conducted by qualified individuals such as professional environmental consultants.

What can I do to prevent exposure to lead-contaminated soil?

If testing reveals elevated soil lead levels on your property, or you live or work in an area that may have elevated soil lead levels, the potential for exposure can be minimized through the following actions:

- Wash hands and face thoroughly after working or playing in the soil, especially before meals and snacks.

- Keep dense groundcover or permanent cover close to the house, roads, and driveways to prevent children from playing in soil where higher lead levels may be found.
- Keep children from playing in bare dirt. Keep toys, pacifiers, and other items that go into children's mouths clean.
- Plant gardens away from house foundations, roads, and driveways where lead levels in the soil may be higher. Have your garden soil tested for lead before you plant. Lime soils as recommended by a soils test; a soil pH of 6.5 to 7.0 will minimize lead mobility.
- Bring in clean sand for sandboxes and add soil known to be free of contamination to food garden areas. Raised garden beds with clean soils should be used if you know your soil has elevated lead concentrations.
- Wash fruits and vegetables from the garden with water before bringing them in the house. Wash again carefully with a 1% vinegar solution or soapy water to remove any remaining soil particles. Discard outer leaves before eating leafy vegetables. Pare root and tuber vegetables before eating. Do not compost the produce peelings and unused plant parts for use back in the vegetable garden.
- Avoid tracking soil into the home and clean up right away if soil is tracked in. Leave shoes at the door or use door mats. Keep pets from tracking soil into your home.

Further Information

For questions related to lead in soils and groundwater, lead sampling, lab analysis and lead testing reports, contact:

Hawai'i Department of Health,
Hazard Evaluation and Emergency Response Office
919 Ala Moana Boulevard, Room 206
Honolulu, Hawai'i 96814

Telephone: (808) 586-4249
Website: http://hawaii.gov/doh/heer

On Hawai'i Island: call the Hilo HEER Office at 808-933-9921

State of Hawai'i Indoor and Radiological Health Branch's lead program helps: (1) prevent exposure to lead and lead-based paint, and (2) maintains the State of Hawaii lead abatement accreditation, certification, and registration systems for lead abatement entities and individuals: http://health.hawaii.gov/irhb/lead/

State of Hawai'i Solid and Hazardous Waste Branch provides guidance on disposal of lead based paint waste and how to manage used lead acid batteries: http://health.hawaii.gov/shwb/files/2013/06/lbpwaste.pdf and http://health.hawaii.gov/shwb/files/2013/06/oldcbats1.pdf

State of Hawai'i Children with Special Health Needs Branch has a Childhood Lead Poisoning Prevention Program: http://health.hawaii.gov/cshcn/home/leadpp/

State of Hawai'i, Safe Drinking Water Branch provides subsidized lead and copper testing for individual homes served by catchment systems: http://health.hawaii.gov/sdwb/raincatchment/

Workplace exposures to Lead

Preventing lead exposures for workers such as those in construction, manufacturing, or other businesses is the

responsibility of the employer through compliance with applicable workplace safety and health regulations.

U.S. Environmental Protection Agency's (EPA) Lead Renovation, Repair and Painting Certification requires that companies performing projects that disturb lead-based paint in homes, child care facilities and pre-schools built before 1978 have their company certified by EPA or the State of Hawai'i, use certified renovators who are trained by EPA-approved training providers, and follow lead-safe work practice: http://www2.epa.gov/lead/renovation-repair-and-painting-program

State of Hawai'i Occupational Safety and Health Division (HIOSH) oversees safe and healthful working conditions for workers in Hawai'i. This includes inspecting workplaces to ensure workers are protected: http://labor.hawaii.gov/hiosh/ . For construction workers, see the guidance on OSHA's Lead in Construction Standard: https://www.osha.gov/Publications/osha3142.pdf

Other Resources for Lead Exposure:
Agency for Toxic Substances and Disease Registry's ToxFAQs website is a federal government website providing information and recommendations regarding lead: http://www.atsdr.cdc.gov/toxfaqs/index.asp

Centers for Disease Control (CDC) Lead Poisoning Prevention Program has information to help eliminate childhood lead poisoning in the United States: https://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=93&tid=22

This fact sheet was created with assistance and funding from USEPA's Region 9 Superfund Division.

Lead – ToxFAQs™

CAS # 7439-92-1

This fact sheet answers the most frequently asked health questions (FAQs) about lead. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system. Lead has been found in at least 1,272 of the 1,684 National Priority List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is lead?

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Because of health concerns, lead from paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years. The use of lead as an additive to gasoline was banned in 1996 in the United States.

What happens to lead when it enters the environment?

- Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- When lead is released to the air, it may travel long distances before settling to the ground.
- Once lead falls onto soil, it usually sticks to soil particles.
- Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.

How might I be exposed to lead?

- Eating food or drinking water that contains lead. Water pipes in some older homes may contain lead solder. Lead can leach out into the water.
- Spending time in areas where lead-based paints have been used and are deteriorating. Deteriorating lead paint can contribute to lead dust.
- Working in a job where lead is used or engaging in certain hobbies in which lead is used, such as making stained glass.
- Using health-care products or folk remedies that contain lead.

How can lead affect my health?

The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high-levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.

How likely is lead to cause cancer?

We have no conclusive proof that lead causes cancer in humans. Kidney tumors have developed in rats and mice that had been given large doses of some kind of lead compounds. The Department of Health and Human Services (DHHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens and the EPA has determined that lead is a probable human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic lead is probably carcinogenic to humans and that there is insufficient information to determine whether organic lead compounds will cause cancer in humans.

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences

CS265956-A

Lead

CAS # 7439-92-1

How can lead affect children?

Small children can be exposed by eating lead-based paint chips, chewing on objects painted with lead-based paint, or swallowing house dust or soil that contains lead.

Children are more vulnerable to lead poisoning than adults. A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness, and brain damage. If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur. Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common if the mother or baby was exposed to high levels of lead. Some of these effects may persist beyond childhood.

How can families reduce the risks of exposure to lead?

- Avoid exposure to sources of lead.
- Do not allow children to chew or mouth surfaces that may have been painted with lead-based paint.
- If you have a water lead problem, run or flush water that has been standing overnight before drinking or cooking with it.
- Some types of paints and pigments that are used as make-up or hair coloring contain lead. Keep these kinds of products away from children.
- If your home contains lead-based paint or you live in an area contaminated with lead, wash children's hands and faces often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

Is there a medical test to determine whether I've been exposed to lead?

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your recent exposure to lead. Blood tests are commonly used to screen children for lead poisoning. Lead in teeth or bones can be measured by X-ray techniques, but these methods are not widely available. Exposure to lead also can be evaluated by measuring erythrocyte protoporphyrin (EP) in blood samples. EP is a part of red blood cells known to increase when the amount of lead in the blood is high. However, the EP level is not sensitive enough to identify children with elevated blood lead levels below about 25 micrograms per deciliter (µg/dL). These tests usually require special analytical equipment that is not available in a doctor's office. However, your doctor can draw blood samples and send them to appropriate laboratories for analysis.

Has the federal government made recommendations to protect human health?

The Centers for Disease Control and Prevention (CDC) recommends that states test children at ages 1 and 2 years. Children should be tested at ages 3–6 years if they have never been tested for lead, if they receive services from public assistance programs for the poor such as Medicaid or the Supplemental Food Program for Women, Infants, and Children, if they live in a building or frequently visit a house built before 1950; if they visit a home (house or apartment) built before 1978 that has been recently remodeled; and/or if they have a brother, sister, or playmate who has had lead poisoning. CDC has updated its recommendations on children's blood lead levels. Experts now use an upper reference level value of 97.5% of the population distribution for children's blood lead. In 2012-2015, the value to identify children with blood lead levels that are much higher than most children have, is 5 micrograms per deciliter (µg/dL). EPA limits lead in drinking water to 15 µg per liter.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for lead (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

APPENDIX E:

State of Hawaii Department of Health
No Further Work Authorization Letter

DAVID Y. IGE
GOVERNOR OF HAWAII

BRUCE S. ANDERSON, Ph.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

August 31, 2018

U0817RH

Mr. Henry Chang
Ililani, LLC
1860 Ala Moana Boulevard, #1000
Honolulu, Hawaii 96857

Dear Mr. Chang:

SUBJECT: Wong's Produce
690 Halekauwila St., Honolulu, Hawaii
Facility ID No. 9-103972 / Disconfirmed Release ID No. 180013

The Department of Health (DOH) has reviewed the following documents:

1. *Underground Storage Tank Closure, 2,500-Gallon Underground Heating Oil Storage Tank and 550-Gallon Underground Gasoline Store Tank, (former) Wong's Produce*, dated January 15, 2017, and prepared by Masa Fujioka & Associates (MFA).

2. *Letter Report, Confirmation Sampling 690 Halekauwila St.*, dated March 18, 2018, and prepared by MFA.

3. *Environmental Hazard Evaluation (EHE) and Environmental Hazard Management Plan (EHMP), (former) Wong's Produce*, dated March 29, 2018, and prepared by MFA.

4. *Underground Storage Tank Closure, 2,500-Gallon Underground Heating Oil Storage Tank and 550-Gallon Underground Gasoline Store Tank, (former) Wong's Produce*, Revised April 5, 2018, and prepared by MFA.

5. *Site Investigation Report, (Former) Wong's Produce*, dated June 19, 2018, and prepared by MFA.

6. *Environmental Hazard Evaluation (EHE) and Environmental Hazard Management Plan (EHMP), Ililani LLC*, Revised July 10, 2018, version 2: FINAL, and prepared by MFA.

Please note the reports have been placed in the public record.

Two (2) abandoned underground storage tanks (USTs) were discovered in the sub-surface during environmental site assessments in April and December 2017. Both USTs were then closed and removed in December 2017. A 2,500-gallon UST containing 16 inches of oil was uncovered in an area near a former boiler room. During an archaeological investigation, the 550-gallon UST containing gasoline was discovered adjacent to the loading dock fronting the former Wong's Produce storage building. The abandoned USTs were not registered with the DOH and do not appear in the Solid and Hazardous Waste Branch, UST database.

Following removal of the two (2) USTs, a multi-increment sample (MIS) for soil was collected from the floor of each excavation. The appropriate DOH Environmental Action Levels (EALs) for this site are for non-drinking water aquifers and greater than 150 meters to surface water. These EALs for both Unrestricted/Residential and Commercial/Industrial are appropriate for this site with Commercial/Industrial allowed as final EALs.

The MIS sample collected from the floor of the 550-gallon UST excavation was non-detectable for all required gasoline analytes with the exception of Total Lead at 1,300 mg/kg vs. the appropriate EALs of 200 mg/kg Unrestricted or 800 mg/kg Commercial/Industrial. The MIS sample collected from the floor of the 2,500-gallon heating oil UST excavation revealed non-detectable petroleum hydrocarbons and 150 mg/kg of Total Lead.

Following UST closure, the DOH requested delineation of lead contamination in soil and installation of groundwater monitoring wells to determine impact to groundwater. Three (3) monitoring wells were installed with MIS soil samples taken from the soil cores in the vadose zone. Analytical results were non-detectable for petroleum hydrocarbons and an average of 60 mg/kg of Total Lead. However, various duplicate MIS soil samples from the cores at one (1) to three (3) feet below grade showed several Total Lead results of 700 to 800 mg/kg. The absence of petroleum hydrocarbons in all MIS soil samples and Total Lead higher than background concentrations near the surface suggests surface sources such as leaking lead acid batteries or imported fill material.

The DOH concurs with the Environmental Hazard Evaluation/Environmental Hazard Management Plan (EHMP) that leaching, direct exposure, and sub-slab soil vapor are not potential hazards at the site due to the lack of petroleum hydrocarbons in soil and groundwater and the absence of dissolved lead in groundwater samples from nearby monitoring wells. Soil samples indicated lead contamination in soil is present. This is a potential direct exposure hazard if this soil is excavated and exposed.

The EHMP will be implemented in the event of any soil excavation at the site. Worker safety and precautions are recommended for the areas of known lead concentrations in subsurface soils. The EHMP should be available to landowner personnel, future lessee personnel, subcontractors, and any other personnel that may encounter the lead-impacted soil. Activities include any excavation, construction activities, dewatering operations, and others.

Due to the absence of petroleum hydrocarbons in numerous soil and groundwater samples from both UST excavations, the DOH determines that UST Release ID No. 180013 has been disconfirmed and will be removed from the DOH-UST database with comments. The DOH issues a status of *No Further Work* for the 2,500-gallon and 550-gallon UST system removals.

Please note that Hawaii UST regulations require evidence of petroleum or other stored substances discovered in the sub-surface of current or former UST facilities to be reported to the DOH-UST Section at (808) 586-4226 within 24 hours, including contamination found at concentrations below EALs and contamination found after receiving a status of No Further Action. Generally, further work will not be required if contaminant concentrations are below appropriate EALs but notification to this office is required within 24 hours.

Groundwater monitoring wells should be properly removed or closed if not utilized. Old or damaged monitoring wells are potential conduits for contamination to the subsurface and groundwater aquifers until they are removed and properly closed. Groundwater monitoring wells should be removed or closed in accordance with the DOH-Hazard Evaluation and Emergency Response Office, *Technical Guidance Manual* available online.

If you have any questions regarding this letter, please contact Mr. Richard Takaba of our Underground Storage Tank Section at (808) 586-4226.

Sincerely,

LENE ICHINOTSUBO, P.E., ACTING CHIEF
Solid and Hazardous Waste Branch

Ililani

Second Draft Environmental Assessment

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS