Innovation Block at Lot "C" Master Plan
Draft Environmental Assessment

September 2015

Prepared For

Department of Business, Economic Development & Tourism
Hawaii Community Development Authority

HTDC
HIGH TECHNOLOGY DEVELOPMENT CORPORATION

Prepared By

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Ref. No.: DEV DP 2.80

September 10, 2015

Ms. Jessica Wooley, Director
Office of Environmental Quality Control
Department of Health
State of Hawaii
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

Dear Ms. Wooley:

Re: Draft Environmental Assessment – Anticipated Finding of No Significant Impact, Innovation Block at Lot C Master Plan, Tax Map Key: (1) 2-1-015: 052, Honolulu, Oahu, Hawaii

With this letter, the Hawaii Community Development Authority ("HCDA") hereby transmits the Draft Environmental Assessment and anticipated Finding of No Significant Impact ("DEA-AFONSI") for the proposed Innovation Block at Lot C Master Plan at Tax Map Key (1)2-1-015: 052, in the Honolulu District on the island of Oahu for publication in the next available edition of the *Environmental Notice*.

Included in the DEA-AFONSI are copies of comments that the HCDA received during pre-assessment consultation, along with the corresponding responses.

We have enclosed one (1) each the following items:

- Hardcopy of the Office of Environmental Quality Control ("OEQC") publication form and two (2) hardcopies of the DEA-AFONSI; and

- CD including the DEA and OEQC publication form in PDF format.

If you should have any questions regarding this matter, please contact our consultant, Mr. Earl Matsukawa at (808) 946-2277.

Sincerely,

Aedward Los Banos
Acting Executive Director

AJHC/DN/AM:ak

Encs.:
1. Two (2) hard copies of DEA-AFONSI
2. One (1) electronic copy of DEA-AFONSI
3. One (1) hard copy of OEQC Publication Form
4. One (1) electronic copy of OEQC Publication Form

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PREFACE

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

This EA is required because the proposed project is an “agency action” involving the use of state lands and funds. The proposing agency is the Hawaii Community Development Authority (HCDA), which will also be responsible for determining if the Final EA can be filed as a Finding of No Significant Impact (FONSI).

Studies prepared in conjunction with this EA include an Archaeological Assessment Report, a Traffic Impact Report, and a Phase I Environmental Site Assessment. These studies are included herein as appendices.

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SUMMARY

Proposing Agency:	Hawaii Community Development Authority (HCDA)
Location:	Kakaako, O‘ahu, Hawai‘i
Tax Map Keys (TMKs):	(1) 2-1-015: 052
Recorded Fee Owner:	State of Hawai‘i
Existing Use:	Presently, the project site is mostly used as a paved parking lot serving the University of Hawaii (UH) John A. Burns School Of Medicine (JABSOM), UH Cancer Center (UHCC) and the surrounding area. The site is also used to store equipment for JABSOM .
State Land Use Classification:	Urban
HCDA Makai Area Plan Land Use Designation:	Mixed-Use Zone
County Zoning Designation:	The HCDA supersedes the City & County of Honolulu’s underlying zoning designation of General Preservation (P-2)
Proposed Action:	The proposed action encompasses the phased development of the facilities listed below: o Entrepreneur’s Sandbox (Approximately 13,500 SF) o Innovation Hale (Approximately 150,000 SF) o Kewalo Incubation Center (KIC) (Approximately 47,000 SF) o Learning Center (Approximately 140,000 SF) o Regional Parking Garage (Approximately 900 stalls)
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. 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. Further consultation and coordination with applicable agencies will assure that construction activities can avoid impacts to existing utility lines.

Anticipated Determination: Finding of No Significant Impact (FONSI)

Parties Consulted During Pre-Assessment:

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

State Legislative Branch
Senator Donna Mercado Kim
Senator Suzanne Chun Oakland
Representative Karl Rhoads
Representative John Mizuno

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 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
Office of Environmental Quality Control
Office of Hawaiian Affairs
University of Hawaiʻi at Mānoa Environmental Center

City Council
Councilmember Carol Fukunaga
Councilmember Joey Manahan

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 Hawaiʻi
Hawaiʻi Gas
Hawaiian Electric Company
Oceanic Cable

Other Interested Parties and Individuals
Ala Moana/Kakaako Neighborhood Board No. 11

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1. INTRODUCTION

The High Technology Development Corporation (HTDC) is a state agency established by the Hawaii State Legislature in 1983 to facilitate the development and growth of Hawai'i's commercial high technology industry. The State views high technology as an important driver in the diversification of Hawaii's economy and one that provides quality, high-paying jobs for Hawai'i residents. The HTDC is proposing to relocate their operations from the University of Hawai'i – Mānoa to proposed new facilities in Kaka'ako on land owned and regulated by the Hawai'i Community Development Authority (HCDA).

Since the project will involve the use of State lands and funds, it is subject to Chapter 343, Hawaii Revised Statutes (HRS), referred to as the Hawai'i EIS Law. HCDA is assuming the role of proposing agency responsible for preparing and processing an Environmental Assessment (EA), based on an anticipated Finding of No Significant Impact (FONSI) for the proposed project.

1.1 Project Site

The project site is located in the Kaka'ako neighborhood of Honolulu, O'ahu, one block makai (seaward) of Ala Moana Boulevard on Ilalo Street, between Keawe Street and Forrest Avenue (See Figure 1-1). Identified as Tax Map Key (TMK): [1] 2-1-015:052, the 5.511-acre parcel is also referred to as Lot C (See Figure 1-2). The project site is relatively flat in topography and is predominately surfaced with asphalt paving and a number of concrete pads. It is presently used mostly as a paved at-grade parking lot serving the John A. Burns School of Medicine (JABSOM) makai campus and University of Hawai'i Cancer Center (UHCC), which are located across Keawe Street, as well other nearby developments.

1.2 Existing Uses

Lot C is currently used as a surface parking lot for the nearby JABSOM and UHCC with a capacity of approximately 414 parking stalls. The southern portion of the property is leased for tenant use and includes surface parking and a small portable building. The Ewa edge of Lot C serves as an access driveway to the neighboring Office of Hawaiian Affair (OHA) property. Several existing utilities cross Lot C in the mauka-makai direction. Lot C is bisected mid-block by a 10 foot wide sewer easement, a 25 foot wide Hawaiian Electric Company (HECO) overhead utility right-of-way, a concrete storm drain structure, as well as a water main. In addition, a 25 foot wide sewer easement spans the entire length of the Diamond Head property line. Lot C is also populated with existing light poles, overhead cables, and fire hydrants.

1.3 Surrounding Uses

The area surrounding the subject project site is traversed by a grid of streets including north/south (*mauka/makai*) trending streets (from west to east), Forrest Avenue, Keawe Street, Coral Street, Cooke Street, and Ohe Street; and, east/west ('Ewa/Diamond Head) trending streets (from north to south), Ala Moana Boulevard, Ilalo Street, and Kelikoi Street near the Children's Discovery Center Museum (See Figure 1-3).

Major enterprises in the area include Fort Armstrong with the U.S. Immigration and Customs Enforcement, Pier 1, the City's historic Kaka'ako Pump Station, the City's Ala Moana

Wastewater Pump Station, JABSOM and UHCC, the former Gold Bond Building (677 Ala Moana Boulevard), and the Children's Discovery Center Museum. Kewalo Basin, located approximately 2,000 feet to the southeast of the site is one of Honolulu's major commercial boat harbors.

Ala Moana Boulevard provides the primary transportation access to and from Kakaʻako and lies one block makai of Lot C. The site is directly served by Ilalo Street which acts as the principal collector street for vehicles and pedestrians in the Makai Area. The nearest public transit is the existing bus stop near former Gold Bond Building. When the Honolulu Rail Transit system is further completed, the project site will be served by the Civic Center Station planned at Halekauwila Street between South and Keawe Streets. Keawe Street is also designated in the HCDA's Makai Area Plan with a bike path.

1.4 Land Ownership

The project site lands are owned and administered by the HCDA.

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INNOVATION BLOCK AT LOT C MASTER PLAN	FIGURE
LOCATION MAP	1-1

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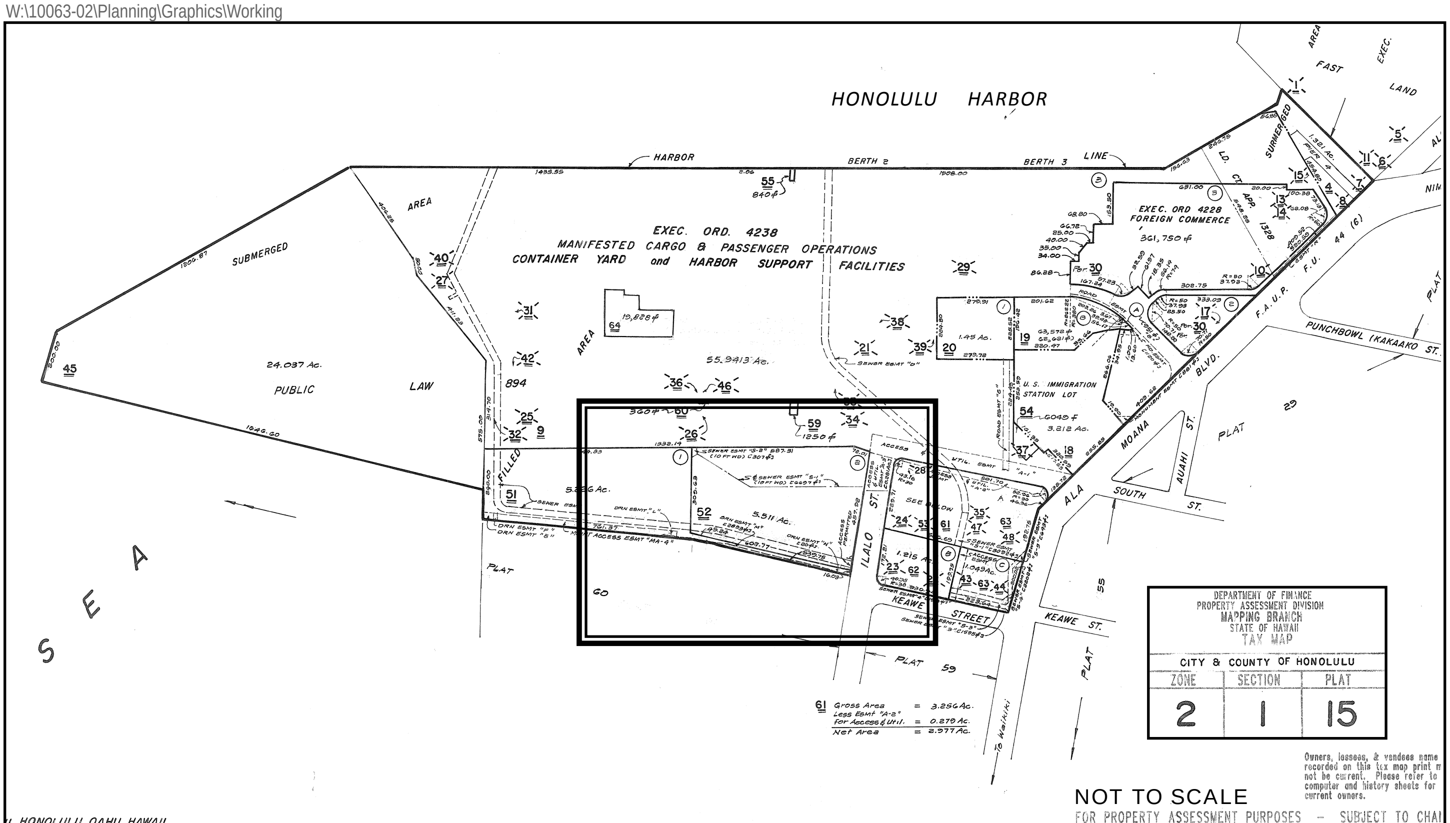

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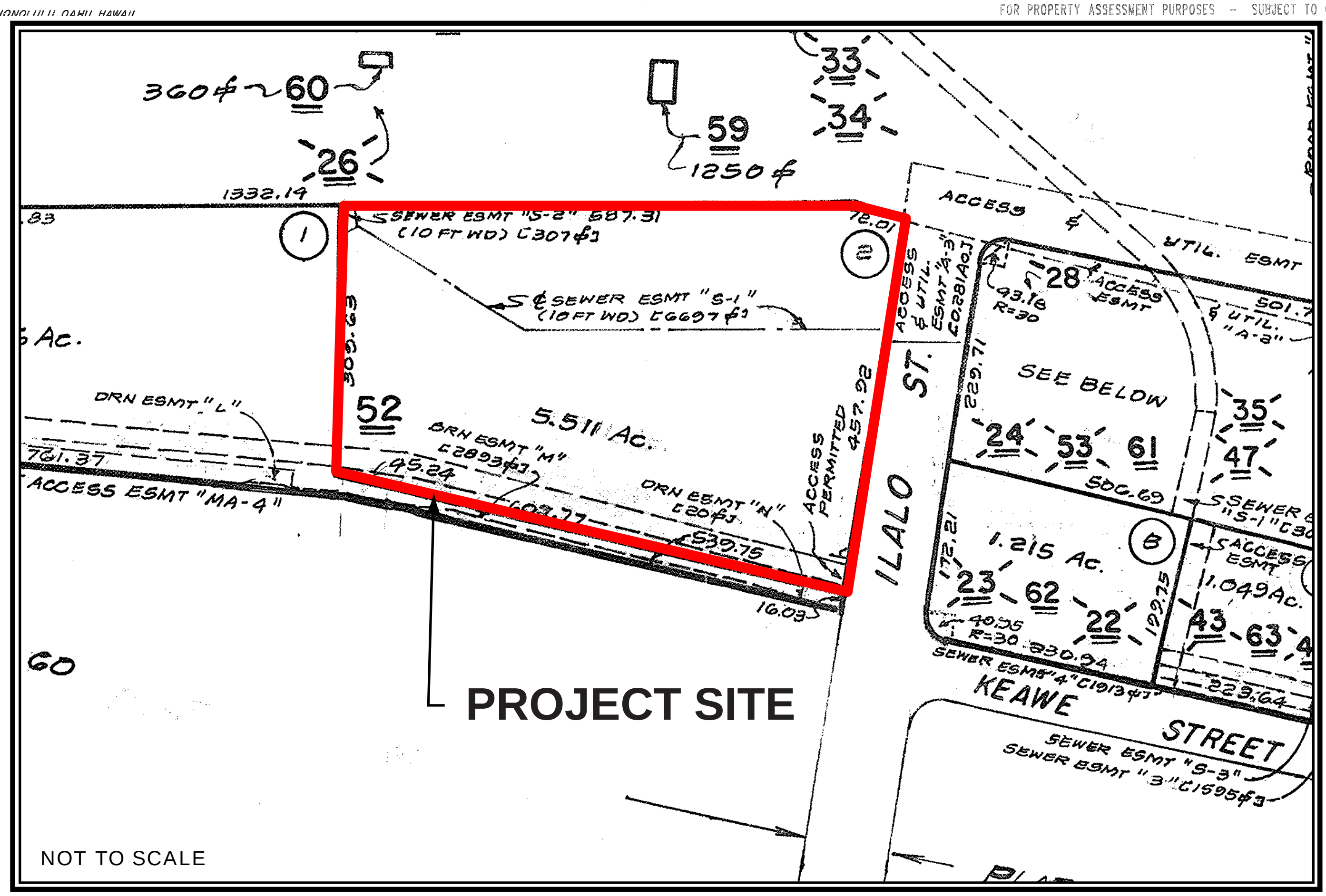

PROJECT SITE

NOT TO SCALE

Source: City and County of Honolulu

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INNOVATION BLOCK AT LOT C MASTER PLAN

TAX MAP KEY

FIGURE 1-2

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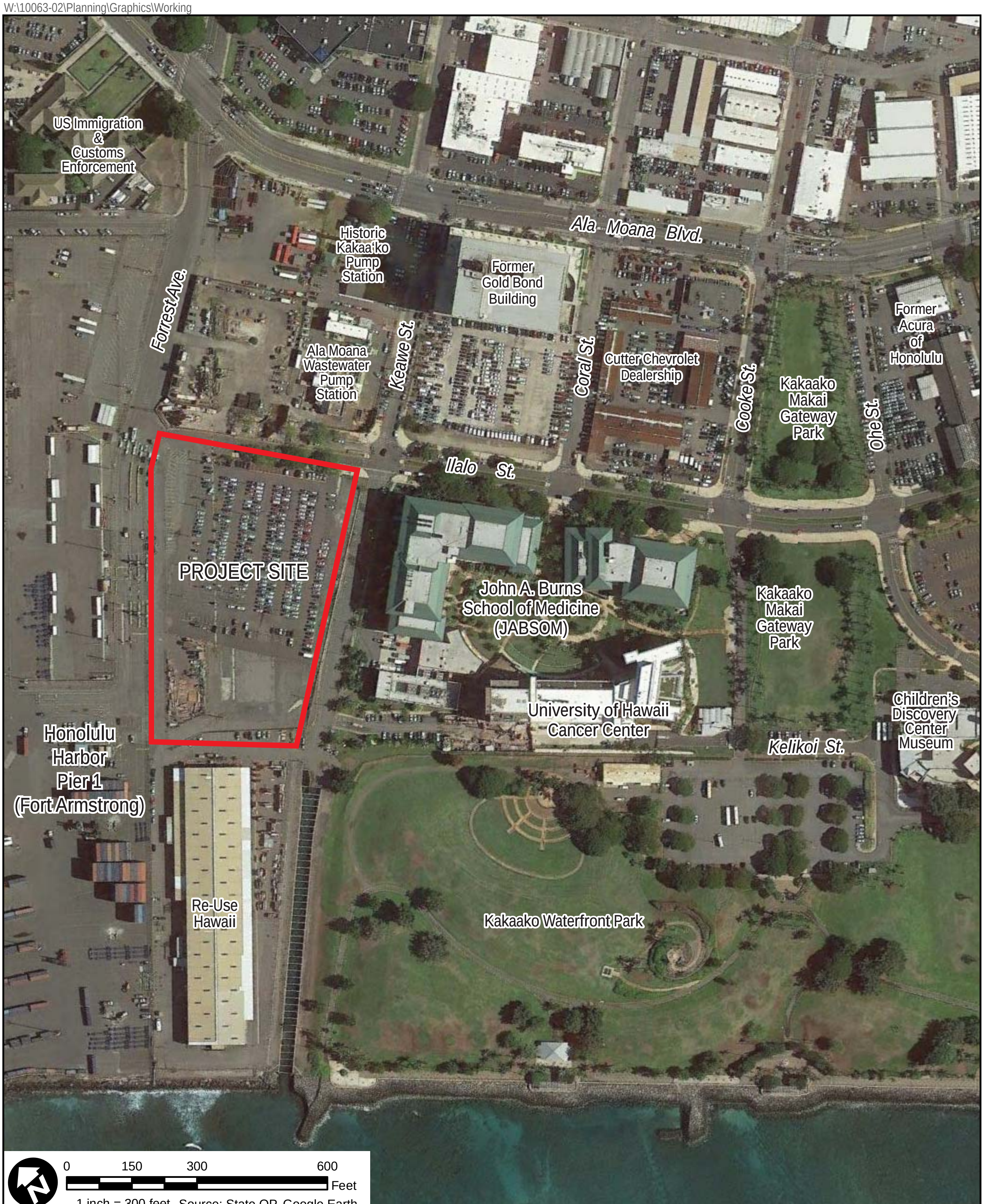

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INNOVATION BLOCK AT LOT C MASTER PLAN

SURROUNDING USES

FIGURE 1-3

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2. PROJECT DESCRIPTION

2.1 PURPOSE AND NEED

The proposed Innovation Block at Lot C Master Plan is intended to create a focal point for the incubation and development of high tech industry in the Hawaiʻi and across the Pacific Rim. HTDC will anchor this use when it vacates its existing facilities in the Mānoa Innovation Center to relocate to the proposed Entrepreneur's Sandbox at the project site. The existing Mānoa Innovation Center is 23 years old and was not designed to support the rapidly changing technological and infrastructural requirements of commercial high-technology development have outpaced its original design. The proposed action is critical to the State's efforts in developing a robust commercial high-technology industry that can support both mature and growing markets.

HCDA will partner with private interest(s) to develop the Innovation Hale, a commercial tower, warehouse and retail facility, to complement the Entrepreneur's Sandbox by establishing an economic engine at the project site (See Figure 2-1). Future development of a regional parking garage will serve the project site as well as other nearby uses. Finally, the Learning Center component will expand upon the University of Hawaii's existing presence in Kakaʻako at the JABSOM and UHCC.

2.2 PROPOSED PROJECT

The HCDA proposes to develop the 5.511-acre (240,059 square feet [SF]) site, referred to as Lot "C" (TMK [1] 2-1-015:052), located in the Makai Area of the Kakaʻako Community Development District. The phased development will improve the entire parcel and is anticipated to include the following facilities (See Figure 2-2).

- Entrepreneur's Sandbox (approximately 13,500 SF)
- Innovation Hale (approximately 150,000 SF)
- Kewalo Incubation Center (KIC) (approximately 47,000 SF)
- Learning Center (approximately 140,000 SF)
- Regional Parking Garage (approximately 900 stalls)

Phase IA:

Phase 1A will include the construction of the 13,500 SF High Technology Development Corporation's (HTDC) Entrepreneur's Sandbox. Site, utility, and landscape work will be limited to that directly associated with the facility.

As a public facility tasked with promoting the development of high technology and enterprise, the Sandbox takes advantage of the visually prominent corner of Ilalo and Keawe Streets. Its loft-like collaboration space is designed to be a visual and physical extension of the street and the adjoining future public plaza, which will encourage accessibility and interaction between the HTDC, budding entrepreneurs, and the community.

The existing surface parking will remain to accommodate required off-street parking for the Sandbox, JABSOM, UHCC and others until subsequent phases.

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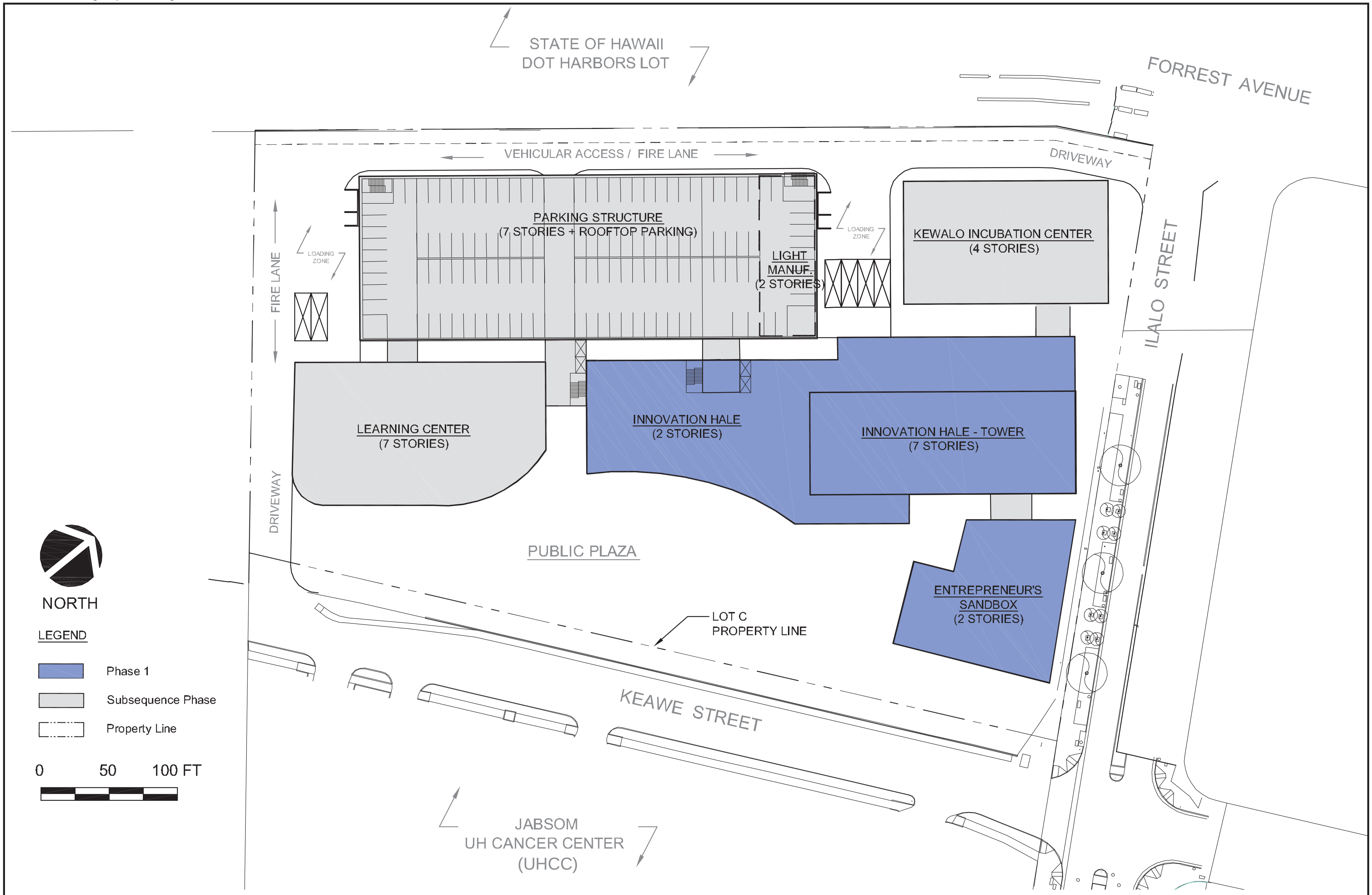

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INNOVATION BLOCK AT LOT C MASTER PLAN

SITE PLAN

FIGURE 2-1

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Source: Ferraro Choi

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INNOVATION BLOCK AT LOT C MASTER PLAN

CONCEPTUAL RENDERING

FIGURE 2-2

The Entrepreneur's Sandbox is intended to provide community spaces and resources that will encourage informal meetings and discussions, exchange of innovative ideas, and provide areas for educational venues. Facilities may include a creative lab, digital media production studio, training room, video conference room, HTDC mentor offices, "phone booth" areas, offices, meeting rooms, kitchen and break room, restrooms and horizontal and vertical circulation.

Phase IB:

Phase 1B will comprise construction of the Innovation Hale Low Rise and Tower facilities, to be co-developed through a partnership between HTDC and a private developer.

Site and landscape work will be limited to that directly associated with the new buildings. The building footprint has been designed to avoid the relocation of the existing sewer, drain, and water easements bisecting the property. However, relocation and undergrounding of an existing HECO overhead utility toward the Ewa edge of the property will likely be accomplished during this phase.

The curved face of the 62,062 SF Innovation Hale Low Rise will present a welcoming retail frontage and visually define the primary entry point along the future public plaza. The Low Rise also offers pedestrian access directly off of the Ilalo Street thoroughfare with a ground floor covered walkway connecting with the Entrepreneur's Sandbox. An indoor/outdoor café near this connection could further strengthen interaction between these private and public facilities.

The 87,600 SF Innovation Hale Tower will provide six-stories of office use atop the Low Rise retail component. The Tower is oriented along a mauka-makai axis and will be set away from the Phase 2 buildings to maximize the amount of window openings for natural daylighting and office views. Entry into the Tower will be from either Ilalo Street or through the ground floor of the Low Rise building.

The existing surface parking will remain to accommodate required off-street parking until subsequent phases

Phase 2:

Phase 2 will include construction of the 47,181 SF HTDC Kewalo Incubation Center and new Parking Structure. Considerable site work will be necessary for this project phase. The existing sewer, water, and drainage utilities and easements, which bisect the property will be relocated align within the new vehicular access road along the 'Ewa property line.

Development of the 4-story Kewalo Incubation Center will expand the HTDC's high technology and innovation development programs by housing start-up companies with tenant office space and support services within a short distance of the Entrepreneur's Sandbox as well as the educational and research campuses of JABSOM and UHCC. In addition, a spacious covered walkway will connect the Incubation Center directly to the Innovation Hale. The Incubation Center faces directly onto a small entry plaza off of Ilalo Street but can also be accessed from the pedestrian path extending from the Parking Structure vertical circulation towers. A loading and service zone behind the building will be shared with the Innovation Hale Low Rise and Tower.

The Parking Structure will accommodate approximately 900 parking stalls, and vehicles will be able to enter the garage from the new access road off of Ilalo Street near Forest Avenue or off of Keawe Street. This site configuration will help maintain separation between the vehicular and service traffic on the Ewa side and the pedestrian-oriented activities on the Diamond Head portions of the Innovation Block.

Parking capacity will fully satisfy the off-street parking requirements for Phases 1 through 3 as well as the displaced 414 surface parking stalls reserved for JABSOM and the Cancer Center. In addition to parking use, portions of the first and second stories will house a business incubator for Light Manufacturing start-up companies conveniently located near the loading and service areas of the adjacent Innovation Hale and Incubation Center.

The Parking Structure will have two vertical circulation towers for internal access. The mauka circulation tower will provide access to the Innovation Hale Low Rise (and indirectly to the Tower and Sandbox) as well as the pedestrian path leading to the Incubation Center. The makai circulation tower will provide access to the future public plaza.

Phase 3:

Phase 3 will involve construction of the 139,786 SF Learning Center and completion of the public plaza along Keawe Street. The Learning Center is envisioned as a public higher education facility which may complement the JABSOM and UHCC campuses. HCDA currently envisions office use with some assembly spaces,

Entry into the Learning Center will be off of the public plaza or from the Parking Structure. Loading and service areas are located on the Ewa side of the building off the access road along the Ewa and makai perimeter.

The curved public plaza will be a gathering area for building tenants, visitors, customers, and passersby. The improved frontage along Keawe Street will become a mauka-makai pedestrian corridor between the Kaka‘ako Waterfront Park and the Makai Area. New crosswalks from the plaza across Keawe Street will encourage pedestrian access and functional interaction between the Innovation Block facilities and JABSOM and UHCC.

The concept of the Innovation Block is to foster collaboration between public and private enterprises by intermingling and creating perceptible physical connections among high tech development, commercial office, retail, and educational uses and their communities to promote the exchange of ideas and stimulate innovation.

2.3 Development Schedule

As discussed previously, project implementation will occur in several phases. Initial work is anticipated to encompass the development of the Entrepreneur’s Sandbox and Innovation

Center (Phases IA and IB). It is estimated that this work will be completed by 2018. The schedule for implementing Phases 2 and 3 is tentatively assumed to be the year 2020.

2.4 Project Costs

The estimated development cost of the Sandbox and Incubation Center is estimated at $39 million. Cost estimates for the subsequent project phases have yet to be developed.

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

3.1 Climate

The climate of Oʻahu 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 Oʻahu. 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 Hawaiʻi, the island of Oʻahu accounts for approximately 80 percent of the state's total carbon dioxide emissions (ICF 2008). Hawaiʻi'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. 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 Oʻahu is a volcanic doublet formed by the Waiʻanae Range to the west and the younger Koʻolau 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 Kakaʻako Peninsula which lies on the Honolulu Plain, a narrow coastal plain along Oʻahu's south central coast. The Honolulu Plain and much of the remaining southern edge of Oʻahu 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. Much of the area comprising Kakaʻako Makai was originally submerged land.

With the exception of the landscaped mounds covering a former landfill and solid waste disposal site in what is presently a portion of the Kakaʻako Waterfront Park, the terrain of Kakaʻako Makai is relatively flat. The average elevation of the area is approximately 5 feet above mean sea level, and sloping gently towards the coastline.

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 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. 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. The fill in the area includes materials dredged from the construction of Honolulu Harbor in the early 20th century.

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. Excavation for building foundations and utility lines are also involved with this effort. 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. As applicable for each phase, these may include but are not limited to:

temporary sediment basins, temporary diversion berms and swales to intercept runoff, silt fences, dust fences, slope protection, stabilized construction vehicle entrance, grate inlet protection, 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 development will limit surface area disturbances to only those areas considered for development on a phase by phase basis. This will allow for the stabilization of soils over build areas before construction activities commence on subsequent phases.

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. 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 Hawaiʻi 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.

3.3 Hydrology

3.3.1 Surface and Coastal Waters

Southern Oahu's coastal plain, which includes the Kakaʻako 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 1.2 miles north of the project site. Urbanization of the Kakaʻako Makai 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 offshore of the project site is Mamala Bay, located approximately 0.2-miles to the south of the project site. Pursuant to Hawaii 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."

The Honolulu Channel entrance to Honolulu Harbor is located approximately 0.25-miles east of the project site. These waters are also classified as Class A marine waters (See Figure 3-2).

WILSON OKAMOTO CORPORATION

INNOVATION BLOCK AT LOT C MASTER PLAN

SOILS MAP

FIGURE 3-1

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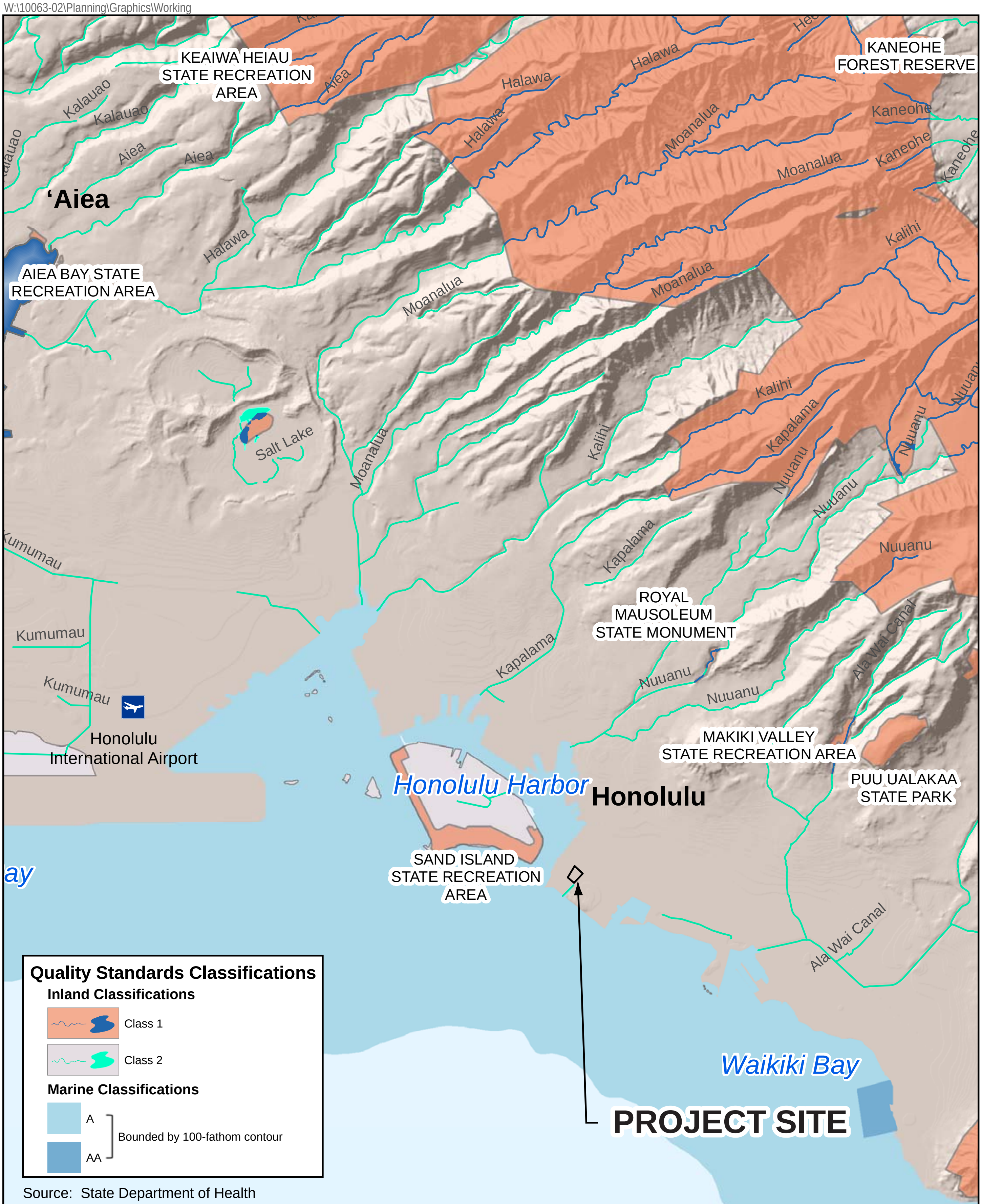

Source: State Department of Health

WILSON OKAMOTO CORPORATION

INNOVATION BLOCK AT LOT C MASTER PLAN

WATER QUALITY STANDARDS MAP

FIGURE 3-2

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. Excavation and grading activities associated with the construction of the proposed project will be regulated by the County's grading ordinances and the NPDES permit administered by the State DOH. 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. As previously mentioned, 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 Hawaiʻi Administrative Rules, Chapters 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.

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) (see Figure 3-3).

Impacts and Mitigation Measures

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 lies well 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).

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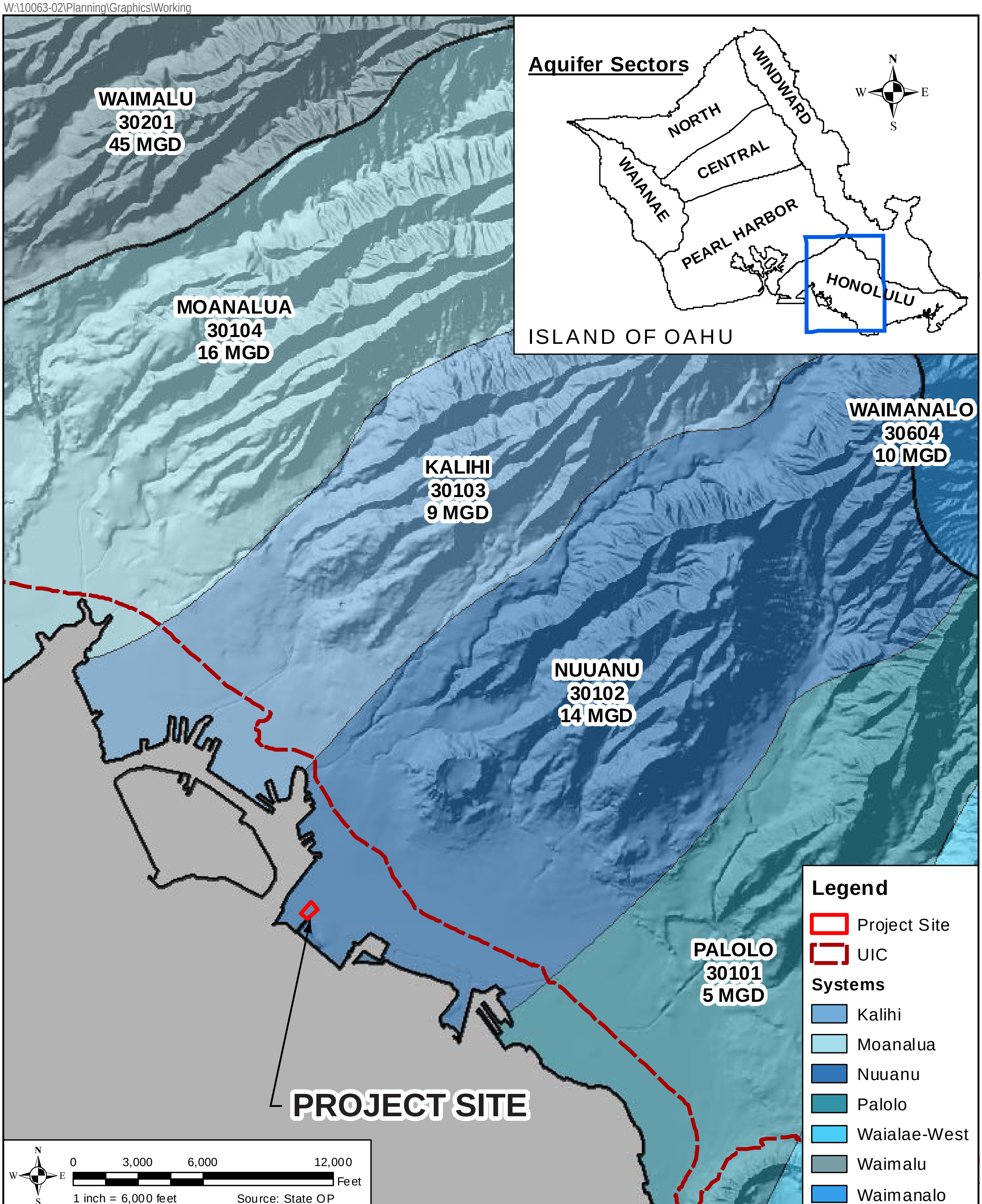

WILSON OKAMOTO CORPORATION

INNOVATION BLOCK AT LOT C MASTER PLAN

AQUIFER MAP

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. Nuʻuanu 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 B) 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 3-4). There are no base flood elevations or depths shown within this zone.

According to the Tsunami Evacuation Zone maps for Oahu, the project site lies entirely within the tsunami evacuation zone (see Figure 3-5).

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts on flood hazards in the project area are anticipated as 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. 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, ʻIwa in 1982 and ʻIniki 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.

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.

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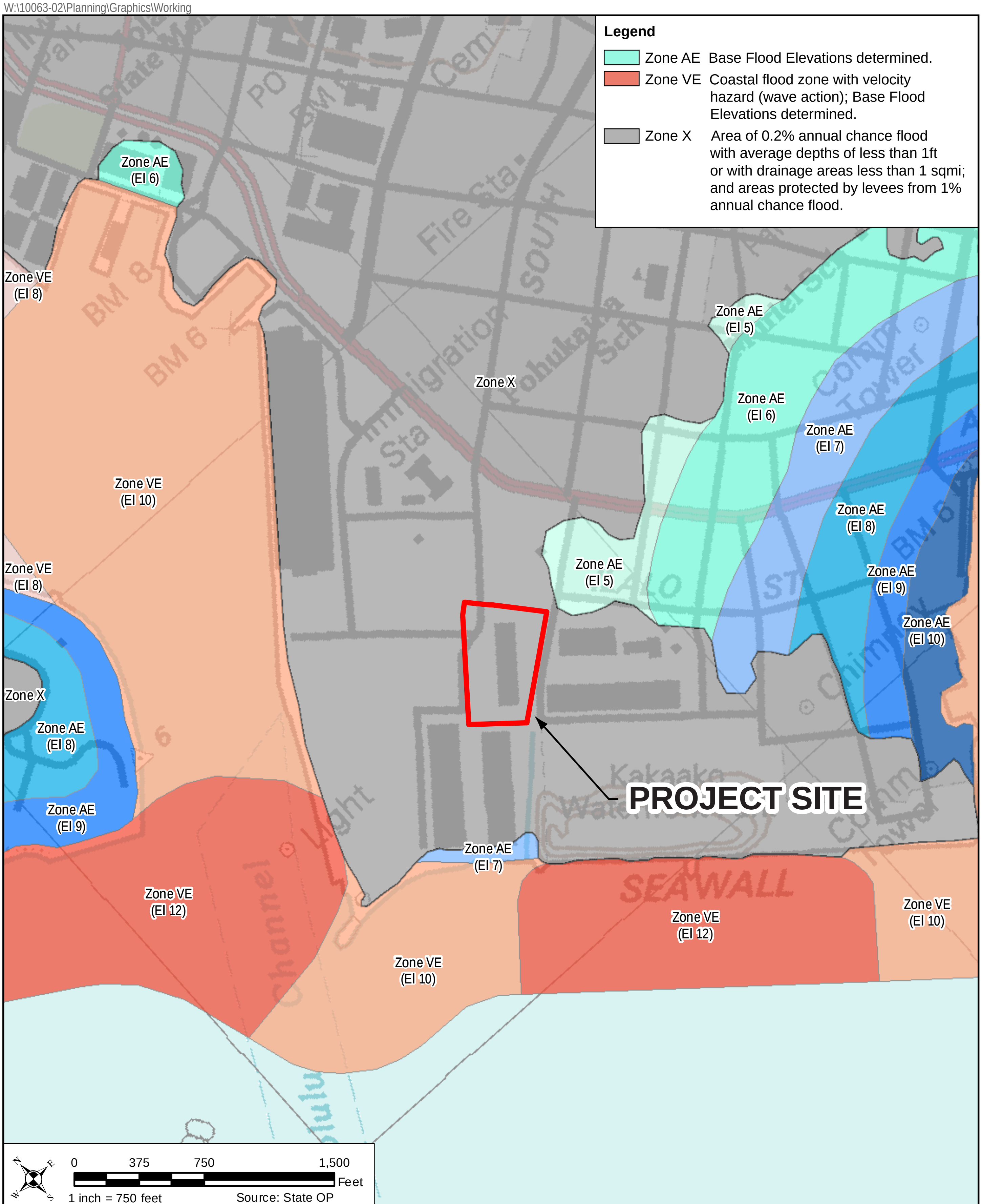

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INNOVATION BLOCK AT LOT C MASTER PLAN

FLOOD INSURANCE RATE MAP

FIGURE 3-4

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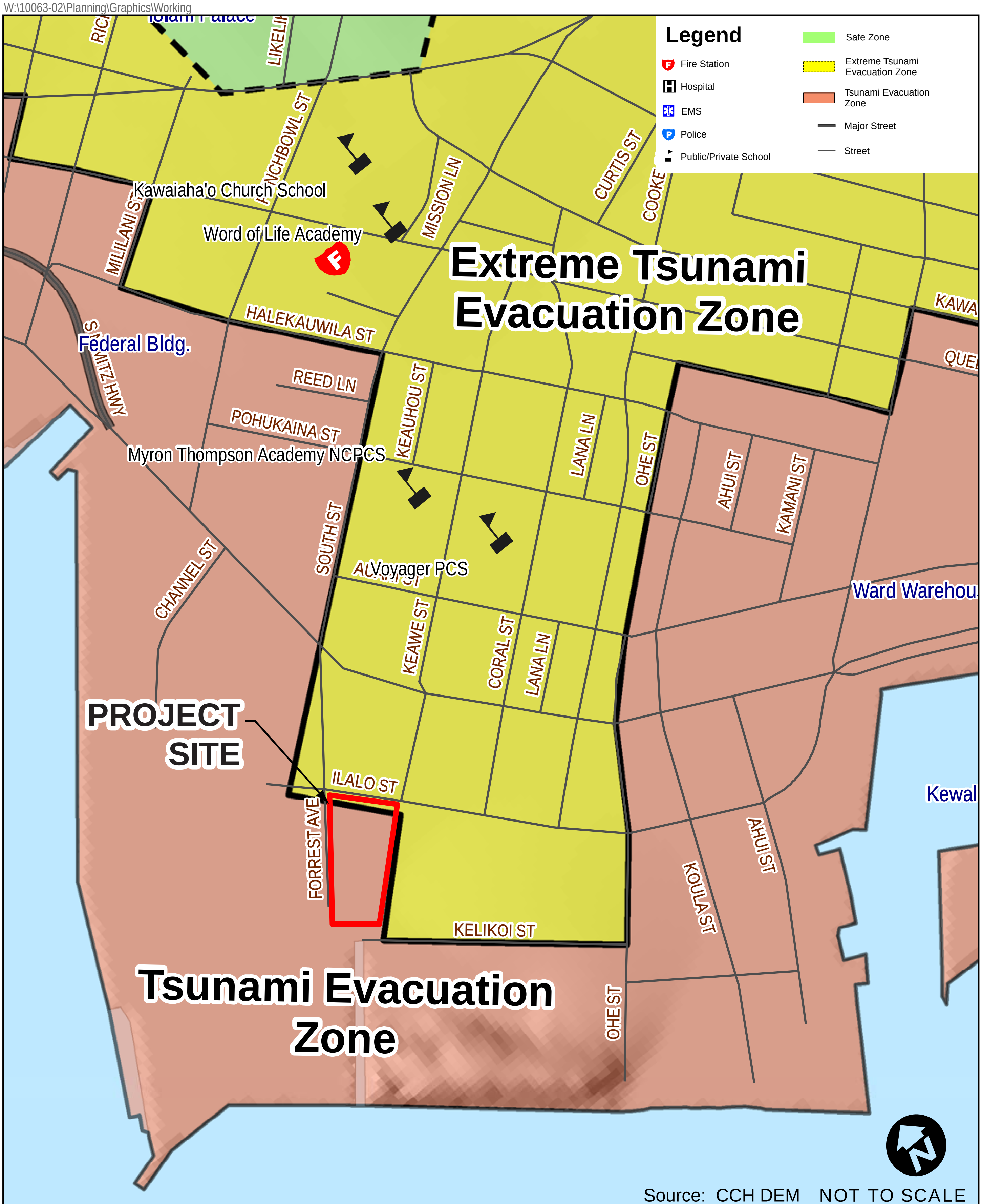


WILSON OKAMOTO CORPORATION

INNOVATION BLOCK AT LOT C MASTER PLAN

TSUNAMI EVACUATION ZONE MAP

FIGURE 3-5

3.4.3 Seismic Hazard

The southern shoreline of O‘ahu lies 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 to exist 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.

A Biological Assessment conducted prior to construction of the adjoining UH Cancer Center also included the proposed project site (Rana Biological Consulting, Inc., April 2011). Field reconnaissance surveys reported that the project site is completely paved over, and that no rare plants, or any species currently proposed, or listed under federal or State endangered species statutes were detected.

It is expected that at least two indigenous migratory shorebird species, the Pacific Golden-Plover (Pluvialis fulva), and Ruddy turnstone (Arenaria interpris) use resources in the Kaka‘ako area on a seasonal basis, although in small numbers and most likely in parking lots and within the waterfront park. Both species are indigenous migratory shorebird species that nest in the high Arctic during the late spring and summer months, returning to Hawaii and the Tropical Pacific to spend the fall and winter months each year. They usually leave Hawaii for their trip back to the Arctic in late April or at the very early part of May each year. Neither of these species are currently listed as protected as threatened or endangered.

In addition to the avian species listed in the Biological Assessment, one other indigenous avifauna species was mentioned during consultation with the Office of Planning in preparation of the State Special Management Area (SMA) permit for the UH Cancer Center. 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 Oahu are alien species, and most are ubiquitous. During a visit to the project site for the subject Biological Assessment, two dogs were being walked on leashes within the parking lot, and a small Indian mongoose (*Herpestes a. auropunctatus*) were observed running next to a dumpster. No rodents were seen, however, it is likely that at least three of the four established alien *muride* found on Oahu, the roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), and European house mouse (*Mus musculus domesticus*) use various resources found within the general project area on a seasonal basis. No mammalian species that are currently proposed, or listed under State or federal endangered species statutes were encountered nor expected.

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

An Archaeological Literature Review and Field Inspection for the project site was conducted by Cultural Surveys Hawaiʻi, Inc. in December 2012 to evaluate the presence of significant historic properties within the project site. The archaeological literature review included studies of archival sources, historic maps, Land Commission Awards (LCA) and previous archaeological reports to construct a history of land use and to determine if archaeological resources have been recorded on or near the project site. A field inspection of the project area followed to identify and surface archaeological resources and to investigate and assess the potential for impact to such sites. The inspection also sought to identify any sensitive areas that may require further investigation or mitigation before the project proceeds. The Archaeological Literature Review and Field Inspection report is included in Appendix A and is summarized below.

Historically, the area surrounding the project site (often referred to as Kewalo), formed a "break" between the heavily populated and cultivated centers of Honolulu and Waikiki. The area was characterized by fishponds, trails connecting Honolulu and Waikiki, the occasional taro lo'i (irrigated field), and habitation sites. The project area itself was located in coastal shallows until being filled in during the early 20th Century (possibly 1911). Therefore, no in-situ subsurface cultural resources pre-dating circa 1911 would be expected. However, it is possible that subsurface remnants of a seawall, dating close to the 20th Century, may extend along the seaward edge of the project site. The fill deposits that make up the present project area are believed to have originated from dredged material from the construction of Kewalo Basin and Honolulu Harbor and thus is relatively free of artifacts as might be found in terrigenous fill materials.

In addition, previous archaeological studies identified that while seaward portions of the Kaka'ako area mauka of Ala Moana Boulevard have yielded cultural properties and/or human skeletal remains, no properties makai of Ala Moana Boulevard appear to have yielded subsurface cultural properties or human skeletal remains.

Impacts and Mitigation Measures

Based on the findings of the Archaeological Literature Review and Field Inspection, no impacts to historic, archaeological, and/or cultural resources are anticipated as a result of the construction and operation of the proposed project.

As the project area was once coastal shallows and is comprised of fill land makai of Ala Moana Boulevard, it is unlikely that there are any cultural properties and/or human skeletal remains. While in the past, the normal recommendation for an area comprised of 20th Century fill would be to recommend no further archeological study, the State Historic Preservation Division (SHPD) has recently been inclined to ask for monitoring programs for developments in such areas citing the possibility of early 20th Century subsurface cultural resources. Therefore, the report recommends early consultation with SHPD to ensure that SHPD directives can be complied with in a timely manner.

Should any significant archeological, cultural, or historic resources be found during construction activities, all work will cease and SHPD be immediately notified for appropriate response and action.

3.7 Cultural Resources and Practices

No cultural resources were identified by CSH in their visits to the site and during excavation work for the subject Archaeological Literature Review and Field Inspection (see Appendix A). The project site and surrounding lands are not used for traditional, customary, or cultural practices. The project site is located on artificially created land comprised of mixed fill soils in an area that was submerged by the ocean until modern times. Plants found at the site are introduced grass species not associated with cultural gathering or use activities. The artificial creation and developed condition of the site is not conducive to the presence of wahi pana (storied place) or other sites associated with cultural practices.

<u>Impacts and Mitigation Measures</u>

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 sugar cane burning, and natural sources, such as windblown dust and volcanic activity. The DOH Clean Air Branch is responsible for regulating and monitoring pollution sources to ensure that the levels of criteria pollutants remain well below the State and federal ambient air quality standards.

The State maintains six air monitoring stations on the island of Oahu, 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. Vehicular traffic on Nimitz Highway/Ala Moana Boulevard, however, has contributed to carbon monoxide levels that have occasionally exceeded State standards in the immediate vicinity of some busy intersections. Air quality at the project site, however, is generally considered to be good due to its distance from Ala Moana Boulevard and the typical flow of fairly constant northeasterly tradewinds that disperse pollutants seaward.

<u>Impacts and Mitigation Measures</u>

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 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.

3.8 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.

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 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.

3.9 Hazardous Materials

A Phase I Environmental Site Assessment (ESA) was prepared by EnviroServices & Training Center LLC (ETC) in July of 2015. This study is included herein as Appendix B, and is summarized below.

The purpose and goal of this Phase I ESA is to conduct an inquiry designed to identify recognized environmental conditions (REC) in connection with the project site. REC are defined as: the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: 1) due to any release to the environment; 2) under conditions indicative of a release to the environment; 3) under conditions that pose a material threat of a future release to the environment. *De Minimis* conditions are not recognized environmental conditions.

The subject Phase I ESA was performed in accordance with the American Society for Testing and Materials (ASTM) International Standard E1527-13 entitled Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (referred to herein as the ASTM Practice). The ASTM Practice is used to assess the environmental condition of commercial real estate with respect to contaminants within the scope of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and petroleum products. As such, the ASTM Practice was designed to satisfy "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined in 42 United States Code (U.S.C.) §9601(35)(B).

Visual observation for the use and/or storage of hazardous materials and hazardous waste was performed on May 29, 2015. Other than petroleum staining typically associated with parking areas, there were no indications of petroleum impacts or hazardous materials on the project site. Additionally, there were no indications of underground storage tanks (USTs), aboveground storage tanks (ASTs), or their associated piping. Five HECO-owned pole-mounted transformers were observed on the Subject Property. Two of the transformers were fair to poor condition with evidence of corrosion; however, no indications of a release from these transformers was observed. In a letter, dated June 1, 2015, HECO confirmed that the transformers are considered 'Non PCB'. Based on these findings, the observed transformers are not considered a recognized environmental condition (REC) for the project site. Stockpiles of apparent sweeping debris were observed along the eastern boundary of the project site. These stockpiles were not considered to be a significant concern.

The project site was not listed by the contracted database search. The contracted database search within specified radii identified one (1) Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) No Further Remedial Action Planned (NFRAP site), one (1) Federal CERCLIS site, one (1) Resource Conservation and Recovery Act (RCRA) Corrective Action Sites (CORRACTS) site, two (2) RCRA sites, forty-one (41) State-Equivalent CERCLIS and National Priorities List (NPL) sites, thirty-two (32) Leaking Underground Storage Tank (LUST) sites, three (3) UST sites, one (1) Brownfields site, and thirteen (13) Orphan. Based on these findings, ETC requested and reviewed select facility files from the Hawai'i Department of Health (DOH) Solid and Hazardous Waste Branch (SHWB) and DOH Hazard Evaluation and Emergency Response (HEER) Office.

ETC reviewed several files associated with the area-wide site known as the *Kaka'ako Brownfields (i.e. Unit 6, Unit 7, Unit 8, Historic Ala Moana Pump Station, and Makai Parcel).* Except for the Historic Ala Moana Pump Station and the Makai Parcel 1, the *Kaka'ako Brownfields* site generally includes multiple sites bound by Ohe Stree, Ilalo Street and the Kewalo Basin.

Review of the *Kaka'ako Pump Station (aka the Historic Ala Moana Pumping Station)* facility file indicated that the site is located north of Ilalo Street, which is topographically upgradient and adjacent to the northern boundary of the Subject Property. Document review indicated that detectable concentrations of petroleum constituents and metals in soil and groundwater

were identified within the active Ala Moana WWPS site and the northwest portion of the Historic Ala Moana Pumping Station property. The petroleum and metal contaminants were suspected to be associated with the historic land filling operations in the Kaka‘ako area.
In addition to those identified by the contracted database, additional Brownfields sites were included in the *Kaka‘ako Brownfields* file (i.e. Unit 2, Unit 4, etc.). Investigative reports indicate that petroleum and heavy metal contaminants are present in the soil and/or groundwater throughout *Kaka‘ako Brownfields*. In addition, review indicated that the impacts were suspected to be associated with the historic usage of the area and the former *Kewalo Incineratory/Ash Dump* site. Based on these findings, ETC cannot dismiss the possibility that residual contaminants associated with the historic use and suspect fill operations may be present on the project site. As such, this finding is considered a REC.

ETC reviewed several client-provided environmental reports pertaining to the former Produce Center & Department of Agriculture (DOA) Facility located at 651 Ilalo Street, which is located adjacent to the eastern boundary of the project site and is the current JABSOM site.

Historical information indicates that the former Foreign Trade Zone CEM Warehouse was formerly located on the project site. Document review indicated that contaminant migration from the Foreign Trade Zone-managed property (including the project site) and the former Kewalo Incinerator Landfill were considered an ‘area of concern’ for the 651 Ilalo Street property (JABSOM). Document review also indicated that a separate Phase I ESA was completed for the Foreign Trade Zone property, including the project site. While ETC was not provided with this document, review indicated that several potential environmental concerns within the Foreign Trade Zone property were identified including ‘former USTs that were removed without proper soil sampling, visual observations of oil-stained ground surface, subsurface contamination originating from improper material storage, and potential USTs’.

The Foreign Trade Zone area was also historically part of Fort Armstrong and used as a military reservation. The western boundary of the 651 Ilalo Street site was analyzed for potential petroleum contaminant migration from the project site. Analytical results along the western boundary of the site indicated that detectable concentrations of Total Petroleum Hydrocarbons – Diesel (TPH-D), TPH-O (Organics), and toluene were noted in the subsurface soils. While no analytical data was found for the project site, based on ETC’s review findings coupled with its historical use, ETC cannot dismiss the possibility that residual contaminants associated with the historical use (i.e. former UST, storage practices, etc.) of the project site. Consequently, this finding is considered a REC.

In its conclusion, ETC states that it performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E1527-13 on the project site. The aforementioned potential presence of contaminants associated with the historical usage, operations (i.e former UST, storage practices, etc.), and suspect fill operations on the Subject Property is the only REC identified by this Phase I ESA.

Impacts and Mitigation Measures

Due to the identification of an REC by the Phase I ESA, additional investigation work may be warranted per consultation with the Hawaii Department of Health, Hazard Evaluation and Emergency Response (HEER) office. Any hazardous materials that may be identified prior to or during construction of the proposed project will be handled in accordance with all applicable Federal, State and local regulations.

3.10 Traffic

A Traffic Impact Report (TIR) was prepared in July of 2015 by Wilson Okamoto Corporation to evaluate existing and future conditions in the project area and to ascertain potential impacts resulting from the proposed project (See Appendix C). The findings of this TIR are summarized below.

Field investigations were conducted in May 2015 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:

- *Ala Moana Boulevard, South Street, and Forrest Avenue*
- *Ala Moana Boulevard and Keawe Street*
- *Ala Moana Boulevard and Coral Street*
- *Ala Moana Boulevard and Cooke Street*
- *Ilalo Street and Forrest Avenue*
- *Ilalo Street and Keawe Street*
- *Ilalo Street and Coral Street*
- *Ilalo Street and Cooke Street*

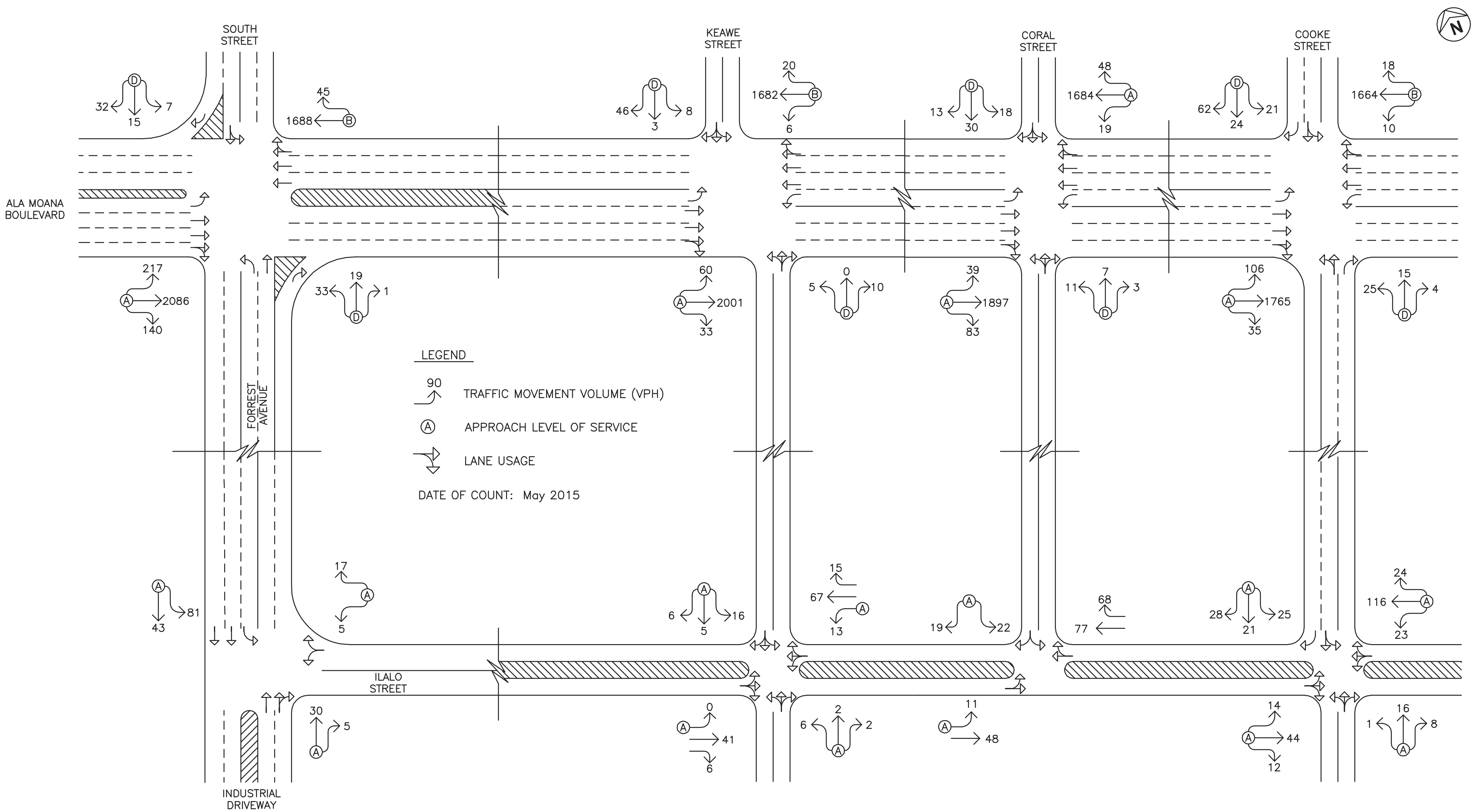
Existing traffic flow and turning movement counts are summarized on diagrammatic representations of the evaluated intersections in the Figures 3-6 to 3-7 for the AM and PM peak hours, respectively.

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 Services are identified 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.

The AM peak hour of traffic generally occurs between 7:15 AM and 8:15 AM while the PM peak hour of traffic generally occurs between 4:15 PM and 5:15 PM. The analysis for these peak hours yielded LOS for existing conditions during the AM and PM peak periods, as shown in Table 3-1.

Table 3-1: Existing LOS Traffic Operating Conditions

Intersection	Approach	AM	PM
Ala Moana Blvd/ South St/ Forrest Ave	Eastbound	A	A
	Westbound	B	B
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Keawe St	Eastbound	A	B
	Westbound	B	B
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Coral St	Eastbound	A	A
	Westbound	A	A
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Cooke St	Eastbound	A	A
	Westbound	B	A
	Northbound	D	D
	Southbound	D	D
Ilalo St/ Forrest Ave	Westbound	A	A
	Northbound	A	A
	Southbound	A	A
Ilalo St/ Keawe St	Eastbound (LT)	A	A
	Westbound (LT)	A	A
	Northbound	A	A
	Southbound	A	B
Ilalo St/ Coral St	Eastbound (LT)	A	A
	Southbound	A	A
Ilalo St/ Cooke St	Eastbound	A	A
	Westbound	A	A
	Northbound	A	A
	Southbound	A	A



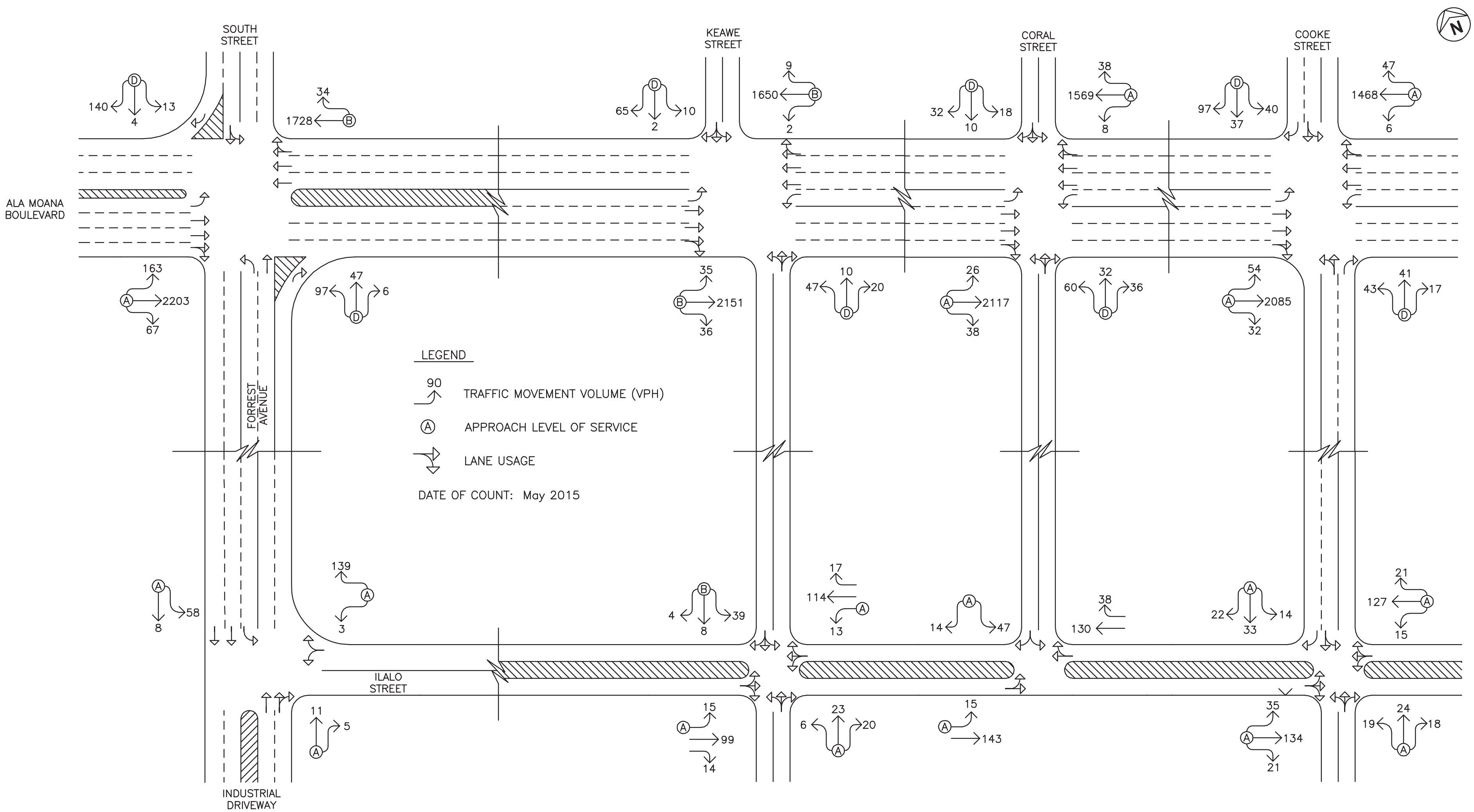
Source: TIR, Wilson Okamoto Corporation

WILSON OKAMOTO CORPORATION

INNOVATION BLOCK AT LOT C MASTER PLAN

EXISTING AM PEAK HOUR OF TRAFFIC

FIGURE 3-6A



Source: TIR, Wilson Okamoto Corporation

WILSON OKAMOTO CORPORATION

INNOVATION BLOCK AT LOT C MASTER PLAN

EXISTING PM PEAK HOUR OF TRAFFIC

FIGURE 3-6B

Impacts and Mitigation Measures

Trip generation projections for the proposed project were based upon generally accepted techniques developed by Institute of Transportation Engineers (ITE) and published in “Trip Generation, 9th Edition,” 2012. The ITE developed the trip generation rates empirically by correlating vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per 1,000 square feet of development. In the TIR, all site-generated trips were conservatively assumed to be new trips in the project vicinity although some of the facilities within the proposed Kaka‘ako Makai Innovation Block at Lot “C” are expected to serve the existing students and faculty of the adjacent JABSOM and UHCC facilities. Tables 3-2 and 3-3 summarize the trip generation characteristics related to the proposed implementation of the Kaka‘ako Makai Innovation Block at Lot “C” applied to the AM and PM peak hours of traffic. Table 3-2 includes trips generated by Phase 1A and 1B in 2018, following construction and assumed full occupancy and operation. Similarly, Table 3-3 is for Phases 2 and 3 where full occupancy and operation is assumed to occur in 2020.

Table 3-2: Year 2018 Peak Hour Trip Generation

YEAR 2018 PHASE 1A AND 1B		
OFFICE (GENERAL OFFICE BUILDING) INDEPENDENT VARIABLE: 1,000 sf of development = 101.1		
		PROJECTED TRIP ENDS
AM PEAK	ENTER EXIT	139 19
	TOTAL	158
PM PEAK	ENTER EXIT	25 126
	TOTAL	151
RETAIL (SHOPPING CENTER) INDEPENDENT VARIABLE: 1,000 sf of development = 62.062		
		PROJECTED TRIP ENDS
AM PEAK	ENTER EXIT	37 23
	TOTAL	60
PM PEAK	ENTER EXIT	111 119
	TOTAL	230
TOTAL (OFFICE AND RETAIL)		
		PROJECTED TRIP ENDS
AM PEAK	ENTER EXIT	176 42
	TOTAL	218
PM PEAK	ENTER EXIT	136 245
	TOTAL	381

Table 3-3: Year 2020 Peak Hour Trip Generation

YEAR 2020 (FROM YEAR 2018) PHASES 2 AND 3		
OFFICE (GENERAL OFFICE BUILDING) INDEPENDENT VARIABLE: 1,000 sf of development = 186.967		
		PROJECTED TRIP ENDS
AM PEAK	ENTER EXIT	257 35
	TOTAL	292
PM PEAK	ENTER EXIT	47 231
	TOTAL	278
INDUSTRIAL (MANUFACTURING) INDEPENDENT VARIABLE: 1,000 sf of development = 10		
		PROJECTED TRIP ENDS
AM PEAK	ENTER EXIT	5 2
	TOTAL	7
PM PEAK	ENTER EXIT	3 4
	TOTAL	7
TOTAL (OFFICE AND RETAIL)		
		PROJECTED TRIP ENDS
AM PEAK	ENTER EXIT	262 37
	TOTAL	299
PM PEAK	ENTER EXIT	50 235
	TOTAL	285

The distribution of site-generated vehicular trips at the study intersections during the Year 2018 and Year 2020 peak hours of traffic consider access to the project site provided via driveways off of Ilalo Street and Keawe Street. Site generated vehicles were split between the two driveways based on their assumed origin/destination and the relative convenience of the available routes. The directional distribution of all site-generated vehicles was based upon the directional distribution of traffic along Ala Moana Boulevard.

To establish the baseline onto which the site-generated vehicular trips would be added, a through-travel forecast was developed. The travel forecast utilized in the TIR was based on the Oʻahu Metropolitan Planning Organization (OMPO) regional forecast model, which accounts for the development of other projects in the vicinity. As opposed to the use of historical traffic count data, the OMPO model is based on Societal Economic Data (SED) which represents the population distribution within a multitude of traffic analysis zones. Since population estimated for the island of Oʻahu indicate that population growth is expected to be relatively linear to the Year 2035, a linear growth in traffic was also assumed over that period. Based on the OMPO model, baseline traffic volumes for the phase build-out years of 2018 and 2020 were projected. This is the so called "without project" conditions.

The projections for 2018 condition without and with the project following completion of Phase 1A and 1B are summarized in Table 3-4. Table 3-5 shows 2020 conditions incorporating traffic from Phase 1A and 1B and then adding traffic for Phases 2 and 3.

Table 3-4: Projected Year 2018 Without and With Project (Phase 1A and 1B) LOS Traffic Operating Conditions

Intersection	Approach	AM		PM	
		Year 2018 w/out Proj	Year 2018 w/ Proj	Year 2018 w/out Proj	Year 2018 w/ Proj
Ala Moana Blvd/ South St/ Forrest Ave	Eastbound	A	A	A	B
	Westbound	B	B	B	B
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ala Moana Blvd/ Keawe St	Eastbound	A	A	B	B
	Westbound	B	B	B	B
	Northbound	D	D	E	E
	Southbound	D	D	E	E
Ala Moana Blvd/ Coral St	Eastbound	A	A	A	B
	Westbound	A	A	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ala Moana Blvd/ Cooke St	Eastbound	A	A	A	A
	Westbound	B	B	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ilalo St/ Forrest Ave	Westbound	A	A	A	A
	Northbound	A	A	A	A
	Southbound	A	A	A	A
Ilalo St/ Keawe St	Eastbound (LT)	A	A	A	A
	Westbound (LT)	A	A	A	A
	Northbound	A	A	A	B
	Southbound	A	A	B	B

Table 3-4: Projected Year 2018 Without and With Project (Phase 1A and 1B) LOS (Continued) Traffic Operating Conditions

Intersection	Approach	AM		PM	
		Year 2018 w/out Proj	Year 2018 w/ Proj	Year 2018 w/out Proj	Year 2018 w/ Proj
Ilalo St/ Coral St	Eastbound (LT)	A	A	A	A
	Southbound	A	A	A	B
Ilalo St/ Cooke St	Eastbound	A	A	B	B
	Westbound	A	A	A	B
	Northbound	A	A	A	A
	Southbound	A	A	A	A

Table 3-5: Projected Year 2018 (With Phase 1A and 1B) and Year 2020 (With Phases 2 and3) LOS Traffic Operating Conditions

Intersection	Approach	AM		PM	
		Year 2018 w/ Proj	Year 2020 w/ Proj	Year 2018 w/ Proj	Year 2020 w/ Proj
Ala Moana Blvd/ South St/ Forrest Ave	Eastbound	A	A	B	B
	Westbound	B	B	B	C
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ala Moana Blvd/ Keawe St	Eastbound	A	B	B	B
	Westbound	B	B	B	B
	Northbound	D	D	E	E
	Southbound	D	D	E	E
Ala Moana Blvd/ Coral St	Eastbound	A	A	B	B
	Westbound	A	A	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ala Moana Blvd/ Cooke St	Eastbound	A	A	A	B
	Westbound	B	B	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D

Table 3-5: Projected Year 2018 (With Phase 1A and 1B) and Year 2020 (With Phases 2 and3) LOS Traffic Operating Conditions

Intersection	Approach	AM		PM	
		Year 2018 w/ Proj	Year 2020 w/ Proj	Year 2018 w/ Proj	Year 2020 w/ Proj
Ilalo St/ Forrest Ave	Westbound	A	A	A	A
	Northbound	A	A	A	A
	Southbound	A	B	A	B
Ilalo St/ Keawe St	Eastbound (LT)	A	A	A	A
	Westbound (LT)	A	A	A	A
	Northbound	A	B	B	B
	Southbound	A	A	B	B
Ilalo St/ Coral St	Eastbound (LT)	A	A	A	A
	Southbound	A	A	B	B
Ilalo St/ Cooke St	Eastbound	A	A	B	B
	Westbound	A	A	B	B
	Northbound	A	A	A	A
	Southbound	A	A	A	A

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3.11 Visual Resources

Hawaii'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 Kaka'ako Makai Area consists of low-rise structures with the exception of the ten-story former Gold Bond Building. Although there are pockets of open spaces in the Makai Area, the major open spaces are the Fort Armstrong area and the Kaka'ako Makai Area Gateway Park and Waterfront Park.

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.

Existing views identified in the Makai Area Plan include:

- Ala Moana Boulevard to Kewalo Basin
- Kewalo Basin Park along the shoreline
- Kaka'ako Waterfront Park along the shoreline
- Kaka'ako Waterfront Park lookout in all directions
- Mauka (mountain) views from local streets

The plan also calls for the creation of a mountain to sea view corridor along Cooke Street.

Impacts and Mitigation Measures

No short- and long-term significant impacts are anticipated on visual resources, as identified in the Makai Area Plan. Buildings to be constructed will be approximately six stories tall and within the 100-foot height limit established by the Makai Area Plan. Seaward views from Ala Moana Boulevard, the nearest coastal highway, are already blocked by the Ala Moana Wastewater Pump Station and the Re-Use Hawaii building. A conceptual rendering of the proposed project improvements is included herein as Figure 2-2.

3.12 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 in on Table 3-6.

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.

Table 3-6
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

the population. Native Hawaiian and other Pacific Islanders comprise a slightly lower 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 high technology industry in Hawaii. As result, even more jobs in this sector could be created on the site and in the State as a whole.

3.13 Public Services and Facilities

3.13.1 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, approximately 1 mile north of the project site.

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 0.5 miles northeast of 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 Hawaii, 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 Oahu. 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 my 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.

3.13.2 Education

The project site is located within the State Department of Education's (DOE) Kaimuki-McKinley-Roosevelt complex area which includes Lincoln, Ma'ema'e, Mānoa, Noelani, Nu'uanu, and Pauoa Elementary Schools; and, Kawananakoa and Stevenson Middle Schools, which feed into either Roosevelt High School or McKinley High School. The native Hawaiian emersion school 'Ānuenue, the Education Laboratory Public Charter School, and Halau Ku Mana Public Charter School are also a part of this complex. Also located on the adjoining block is the UH JABSOM campus, including the University of Hawaii Cancer Center.

The closest Department of Education school is McKinley High School, located approximately a mile from the proposed project site.

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts or increase in demand on schools are anticipated. There are no residences proposed so the project will not induce population growth. Therefore, it is not expected to affect student enrollment at public schools in the area.

3.13.3 Recreational Facilities

The primary recreational resource in the vicinity of the project site is the 30-acre Kaka'ako Waterfront Park located 200 feet 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. To the southeast, approximately 0.18-mile from the project site, 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 0.25 miles southeast from the project site and offers interactive educational exhibits for children and their families.

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. The proposed project does not include residences that could generate demand for recreational facilities.

3.13.4 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 Waianae.

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.

3.14 Infrastructure and Utilities

3.14.1 Water System

The project site is traversed by a 12-inch buried waterline with three 6-inch stub-outs within the parcel. 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 3-7.

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 12-inch waterline. The HCDA 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.

3.14.2 Wastewater System

A 21-inch municipal sewer line lies beneath Ilalo Steet fronting the project site (See Figure 3-8), That line, along with a 16-inch sewer line coming from the opposite direction beneath Ilalo Street, discharge into a 24-inch line near the intersection of Ilalo and Keawe Streets. The 24-inch line carries the combined flows to the City & County of Honolulu's Ala Moana (wastewater) Pump Station, which is located opposite Ilalo Street from the project site.

The pump station receives wastewater flows from Kakaako to Pauoa/Dowsett Highlands on the west to Niu Valley on the west. A 78-inch force main extends underground from the pump station and traverses the project site's eastern border, continuing through the Pier 1 area before crossing beneath Honolulu Harbor to the Sand Island Wastewater Treatment Plant where the wastewater is received for treatment and disposal.

There is a non-municipal wastewater service line that traverses beneath the project site to collect wastewater from areas makai of the project site. No wastewater is currently generated from the project site.

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 21-inch sewer line along Ilalo Street through two new service laterals. In addition, the existing service line traversing the project site will be relocated to the Ewa edge of the project site, paralleling Forrest Avenue. Additional new service lateral(s) to the relocated line will serve future phases of the proposed project. 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.

Due to the proximity of the Ala Moana Pump Station and force mains to the project site, there is a potential for odors and noise emanating from these facilities during periods of maintenance, construction work or as a result of unexpected operational issues or emergencies that could impact future occupants of the project site.

3.14.3 Drainage System

Stormwater runoff at the project site flows into a system of drain inlets that convey flows to box culverts located to the west of the project site. (See Figure 3-9). Those culverts empty into an open drainage channel that runs between the Kakaʻako Waterfront Park and the Re-Use Hawaii building.

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. 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 Hawaiʻi 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 long-term, construction of the proposed project in phases will create impermeable paved surfaces that would reduce the area available on the project site for runoff to percolate into the ground. 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.

3.14.4 Electrical and Communications Systems

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

Telephone service in the area is provided by Hawaiian Telcom.

Oceanic Time Warner Cable of Hawaiʻi is the island's primary CATV provider.

<u>Impacts and Mitigation Measures</u>

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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WILSON OKAMOTO CORPORATION

INNOVATION BLOCK AT LOT C MASTER PLAN

WATER INFRASTRUCTURE

FIGURE 3-7

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INNOVATION BLOCK AT LOT C MASTER PLAN

WASTEWATER INFRASTRUCTURE

FIGURE 3-8

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WILSON OKAMOTO CORPORATION

INNOVATION BLOCK AT LOT C MASTER PLAN

DRAINAGE INFRASTRUCTURE

FIGURE 3-9

FIGURE 3-7 WATER INFRASTRUCTURE

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

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:

Sec. 226-6 Objectives and policies for the economy – in general.

(a) Planning for the State's economy in general shall be directed toward achievement of the following objectives:

(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai‘i's people.

(2) A steady growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.

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

(2) Promote Hawaii as an attractive market for environmentally and socially sound investment activities that benefit Hawaii's people.

(9) Foster greater cooperation and coordination between the government and private sectors in developing Hawai‘i's employment and economic growth opportunities.

(11) Maintain acceptable working conditions and standards for Hawaii's workers.

(13) Encourage businesses that have favorable financial multiplier effects within Hawaii's economy.

(15) Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new, potential growth industries in particular.

(16) Foster a business climate in Hawaii – including attitudes, tax and regulatory policies, and financial and technical assistance programs – that is conductive to the expansion of existing enterprises and the creation and attraction of new business and industry.

Discussion:
In the short-term, project construction expenditures will confer positive benefits on the local economy. These benefits would be derived from the creation of construction and construction support jobs as well as revenues generated by the procurement of building supplies and materials. In the long-term, the proposed Innovation Block at Lot C Master Plan will provide significant opportunities for the incubation and development of commercial high-technology-centered start-ups and businesses ventures which potentially may generate jobs in specialized fields otherwise not-common here in the islands.

In addition to generating employment opportunities, the project will allow HTDC to continue to provide services critical to the incubation of Hawai'i's fledgling high-technology industry, and the diversification of Hawai'i's economy.

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:
The proposed project is located within close proximity to the waterfront of Kakaʻako.

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. 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 Hawaiʻi 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.

4.1.2 State Land Use District

The State Land Use Law, Chapter 205, HRS, is intended to preserve, protect and encourage the development of lands in the State for uses that are best suited to the public health and welfare of Hawaiʻi's people. Under Chapter 205, HRS, all lands in the State of Hawaiʻi 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 Oahu, 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 Hawaii agency which regulates land within the Kakaʻako Mauka and Makai areas (for further discussion see Section 4.1.4).

4.1.3 Hawaiʻi Coastal Zone Management Program

The National Coastal Zone Management (CZM) Program was created through passage of the Coastal Zone Management Act of 1972. Hawaii'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 Hawaii 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 Hawaiʻi 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 200 feet 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. 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.

(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:

An Archaeological Literature Review and Field Inspection for the project site was conducted for the property in December 2012. Based on the findings of the Archaeological Literature Review and Filed Inspection, no impacts to historic, archaeological, and/or cultural resources are anticipated as a result of the construction and operation of the proposed project.

As the project area was once coastal shallows and is comprised of fill land makai of Ala Moana Boulevard, it is unlikely that there are any cultural properties and/or human skeletal remains. While in the past, the normal recommendation for an area comprised of Twentieth Century fill would be to recommend no further archeological study, the State Historic Preservation Division (SHPD) has recently been inclined to ask for monitoring programs for developments in such areas citing the possibility of early Twentieth Century subsurface cultural resources. Therefore, the report recommends early consultation with SHPD to ensure that SHPD directives can be complied with in a timely manner.

Should any significant archeological, cultural, or historic resources be found during construction activities, all work will cease and SHPD be notified immediately.

(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 Makai Area Plan. Buildings to be constructed will be approximately six stories tall and within the 100-foot height limit established by the Makai Area Plan. Seaward views from Ala Moana Boulevard, the nearest coastal highway, are blocked by the Ala Moana Wastewater Pump Station and the Re-Use Hawaii building.

(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 Mamala Bay, located approximately 0.2-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. In addition, as the proposed project will involve soil disturbance greater than one acre, an NPDES Individual Permit for Storm Water Associated with Construction Activity, administered by the State DOH, will be required to control storm water discharges. 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. 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.

(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 Innovation Block at Lot C Master Plan will allow for the growth and diversification of O‘ahu’s economic base through the incubation and development of commercial high technology industry in Hawai‘i. HTDC operations and programs contribute to the economic and social well-being of O‘ahu residents by providing a range of job opportunities in fields that would otherwise not exist in the islands. HTDC efforts include, but are not limited to:

(1) Developing and encouraging industrial parks as high technology innovation centers and developing or assisting with the development of projects within or outside of industrial parks, including participating with the private sector in such development;

(2) Providing financial and other support and services to Hawai‘i based high technology companies;

(3) Collecting and analyzing information on the state of commercial high technology activity in Hawaii;

(4) Promoting and marketing Hawaii as a site for commercial high technology activity; and

(5) Providing advice on policy and planning for technology based economic development.

(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 Oahu, the project site lies entirely within the 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. The proposed improvements are also subject to the State Special Management Area (SMA) permit process as discussed in Section 4.1.5. Applicable State and County requirements will be adhered to in the design and construction phases of the proposed improvements.

(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. The proposed project will also require a Special Management Area permit that will evaluate its consistency with the CZM objectives and policies and require a public hearing.

(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.

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.

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 Makai Area Plan and Makai Area 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 Makai Area was adopted by the HCDA in 2005. Land uses established by the plan are shown in Figure 4-1.

The proposed project is being designed to conform to the Makai Area Plan and Rules. The Makai Area Plan designates the project site as being within the Mixed-Use Zone (MUZ). The MUZ allows for the development of commercial uses, such as offices and retail establishments, and housing. The purpose of this zone is to foster a wide range of development options. Buildings constructed at the project site will conform to density, yard, and open space requirements set forth in the Makai Area Plan and Rules. The maximum height of the proposed buildings will be within the 100-foot maximum allowable height limit as established in the Makai Area Plan and Rules.

4.1.5 Special Management Area Designation

Pursuant to the Hawai‘i CZM Program, Chapter 205A, HRS, the counties have enacted ordinances establishing 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 4-2) requires an SMA Use Permit. Although normally administered by the City and County of Honolulu, because the project site is located within the HCDA Kaka‘ako Community Development District, the approving agency for an SMA permit in this area would be the State Office of Planning. The SMA boundary is shown in Figure 4-2.

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INNOVATION BLOCK AT LOT C MASTER PLAN

LAND USES (KAKAAKO MAKAI PLAN)

FIGURE 4-1

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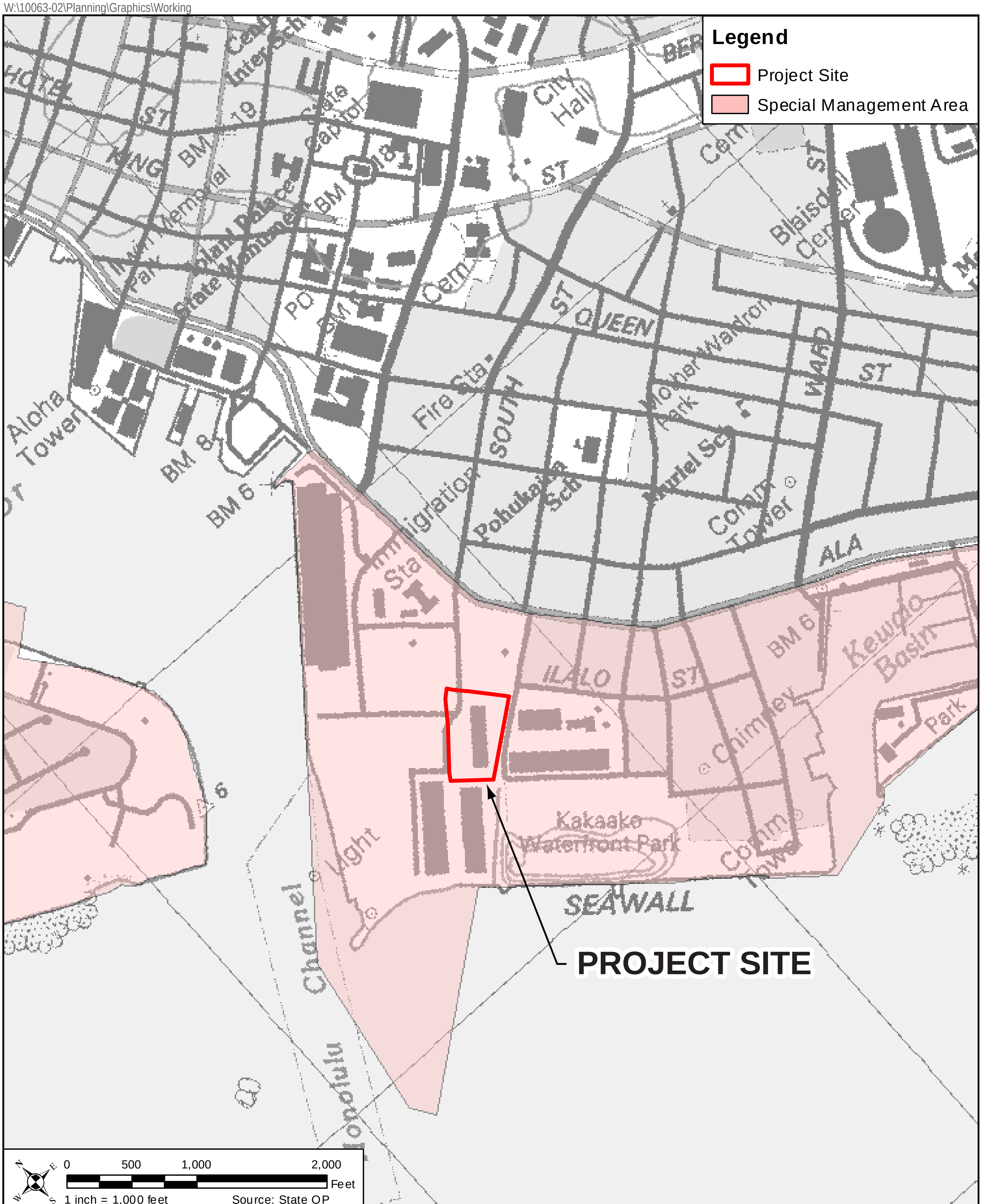

INNOVATION BLOCK AT LOT C MASTER PLAN

SPECIAL MANAGEMENT AREA MAP

FIGURE

4-2

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4.1.6 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.

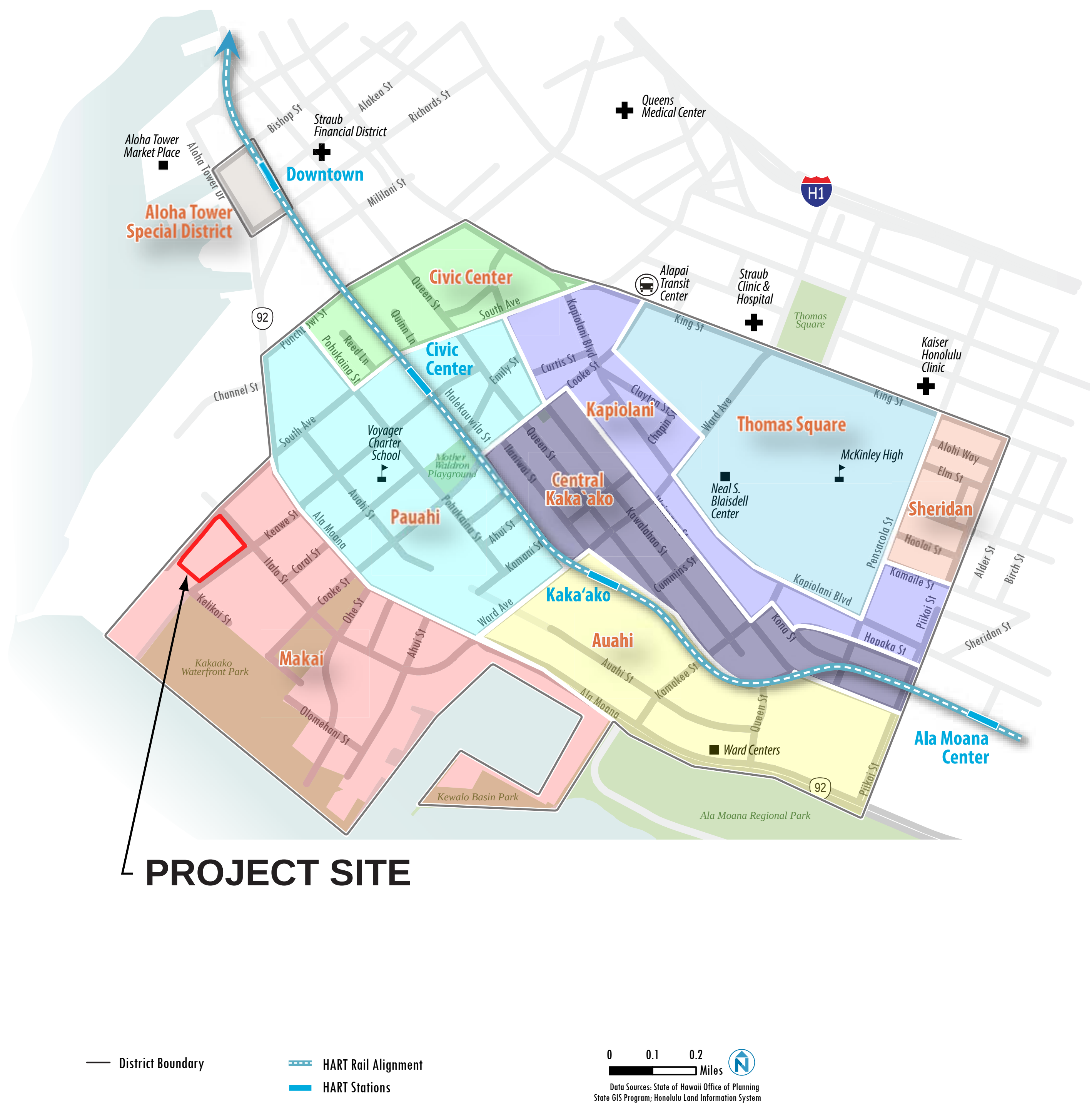
The KCDD has nine neighborhoods each with their own emerging character predominant land use. The TOD Overlay plan, identifies the subject project as located within the Makai neighborhood (see Figure 4-3). While the TOD Overlay Plan proposes no new development in the Makai District directly related to the proposed transit stations, it 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. Specifically, the commercial uses proposed under the Innovation Block at Lot C Master Plan conform to the Commercial/Industrial street typology classification set forth in the TOD Overlay Plan for Ilalo Street, Keawe Street, and Forrest Avenue (see Figure 4-4).

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 O‘ahu 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 O‘ahu. These objectives contain both statements of desirable conditions to be sought over the long run and statements of desirable conditions that can be achieved within an approximately 20-year time horizon. Second, the General Plan is a statement of broad policies that facilitate the attainment of the objectives of the Plan.



Source: HCDA TOD Overlay Plan

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INNOVATION BLOCK AT LOT C MASTER PLAN

TOD NEIGHBORHOOD MAP

FIGURE 4-3

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Source: HCDA TOD Overlay Plan

INNOVATION BLOCK AT LOT C MASTER PLAN

TOD STREET TYPOLOGY CLASSIFICATION MAP

FIGURE 4-4

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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;

(5) Transportation and utilities;
(6) Energy;
(7) Physical development and urban design;
(8) Public safety;
(9) Health and education;
(10) Culture and recreation; and
(11) Government operations and fiscal management.

The proposed project is relevant and consistent with the following applicable goals, objectives, policies, and actions of the *City and County of Honolulu General Plan*:

II. Economic Activity

Objective A

Policy 1
Encourage the growth and diversification of O'ahu's economic base.

Policy 2
Encourage the development of small businesses and larger industries which will contribute to the economic and social well-being of O'ahu residents.

Policy 3
Encourage the development in appropriate locations on O'ahu of trade, communications, and other industries of a nonpolluting nature.

Policy 4
Encourage the development of local, national, and world markets for the products of O'ahu-based industries.

Discussion:

In the long-term, the proposed Innovation Block at Lot C Master Plan will allow for the growth and diversification of O'ahu's economic base through the incubation and development of commercial high technology industry in Hawai'i. HTDC operations and programs contribute to the economic and social well-being of O'ahu residents by providing a range of job opportunities in fields that would otherwise not exist in the islands. HTDC efforts include, but are not limited to:

(1) Developing and encouraging industrial parks as high technology innovation centers and developing or assisting with the development of projects within or

outside of industrial parks, including participating with the private sector in such development;

(2) Providing financial and other support and services to Hawai‘i based high technology companies;

(3) Collecting and analyzing information on the state of commercial high technology activity in Hawaii;

(4) Promoting and marketing Hawaii as a site for commercial high technology activity; and

(5) Providing advice on policy and planning for technology based economic development.

IX. Health and Education

Objective B
To provide a wide range of educational opportunities for the people of O‘ahu

Policy 4
Encourage the construction of school facilities that are designed for flexibility and high levels of use.

Policy 5
Facilitate the appropriate location of learning institutions from the preschool through the university levels.

Discussion:
In the long-term, the proposed project will provide educational opportunities in affiliation with schools, businesses, and other organizations to individually as well as collaboratively develop and offer a tech-focused curriculum that will provide both specialized and diverse educational opportunities to the people of Hawai‘i and the island of O‘ahu.

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 Waialae-Kahala in the east. The PUC is home to almost half of Oahu’s population and three quarters of all jobs. The *Primary Urban Center Development Plan* (June 2004) provides a vision for the PUC in the areas of land use, transportation, infrastructure, and public facilities. It also provides policies and guidelines for achieving that vision. The City’s Land Use Map indicates that the project site lands are designated for Institutional uses. The proposed project is consistent with the following guidelines, policies and principles contained in the PUC Development Plan:

3.2.2.4 Shopping and Retail Business Districts

- *District Commercial.*
  District Commercial includes a wide variety of commercial uses located in the core areas of the Primary Urban Center. These districts typically have larger facilities and serve larger populations than community/neighborhood commercial districts. They may include major office buildings, shopping

centers, and older commercial streets that serve a district-wide, regional or island-wide population. Mixed uses, including medium to higher density residential uses where appropriate, and higher densities are encouraged in these areas. Downtown should have the tallest buildings on Oahu. In other areas, maximum building heights should he established on the basis of view-plane studies to preserve views of natural landmarks.

Discussion:
In the long-term, the proposed Innovation Block at Lot C Master Plan will provide significant opportunities for the incubation and development of tech-centered start-ups and businesses which will generate jobs in fields presently non-existent here in the islands. These proposed facilities are consistent with the vision set forth in the PUC Development Plan outlined above.

In addition to generating employment opportunities, the project will allow HTDC to continue to provide services critical to the development of Hawai‘i's fledgling tech industry, and the diversification of Hawai‘i's economy.

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 General Preservation (P-2). See Figure 4-5. On Oahu, 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 Hawaii 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 following is a list of permits, approvals, and reviews that may be required prior to construction and operation of the proposed project.

Federal

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

State of Hawai‘i

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

Office of Planning
- Special Management Area Permit

Hawaiʻi Community Development Authority
- Development Permit

City and County of Honolulu

Department of Planning and Permitting
- Building Permit
- Grading Permit/Trenching Permit

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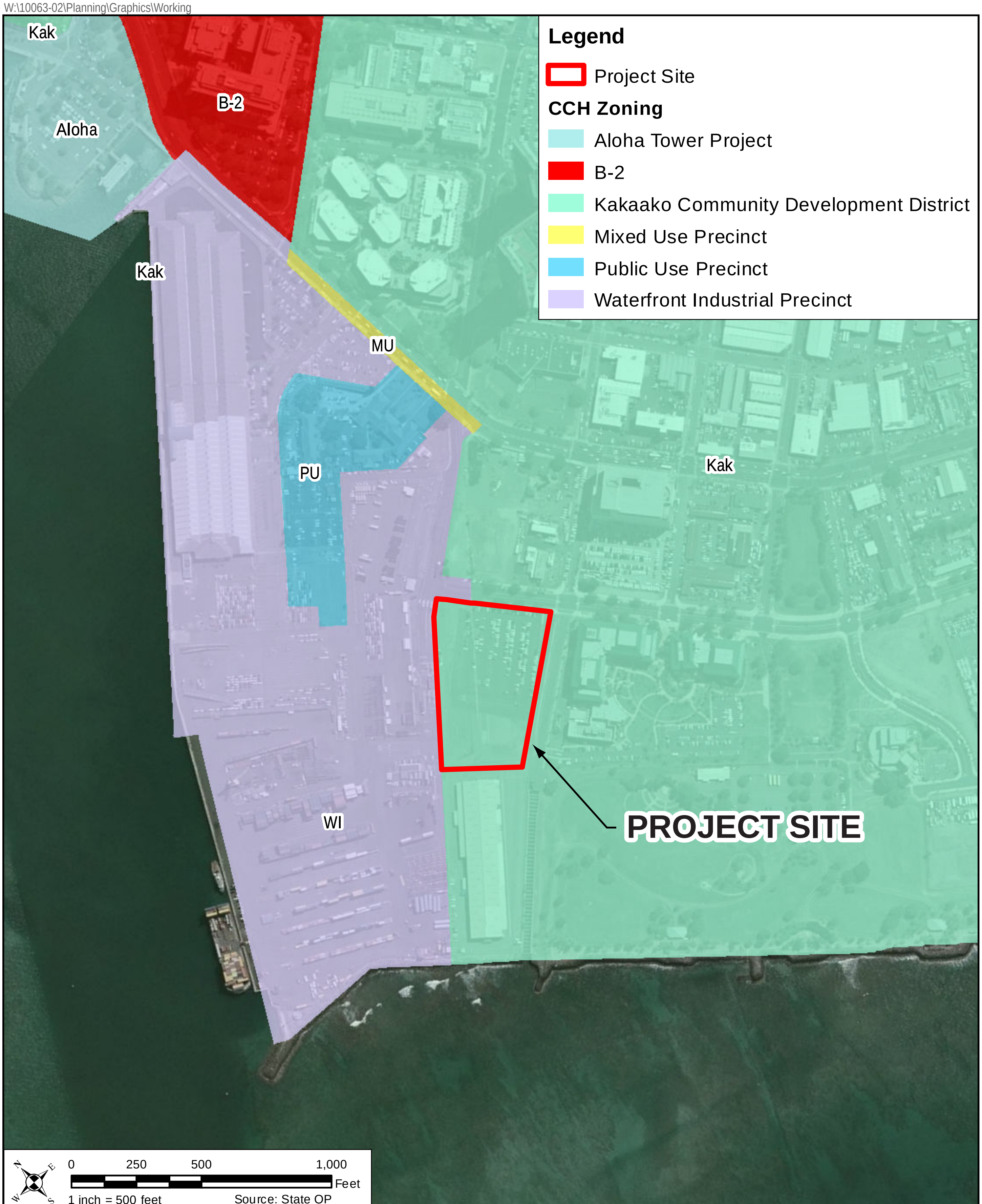

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INNOVATION BLOCK AT LOT C MASTER PLAN

CITY AND COUNTY OF HONOLULU ZONING

FIGURE 4-5

5. ALTERNATIVES ELIMINATED FROM CONSIDERATION

Hawaiʻi Administrative Rules (HAR) § 11-200-10 (1996) requires an environmental assessment to identify and consider alternative means to realize the purpose and need of the proposed action.

Alternatives eliminated from consideration include no action, and alternative site schemes.

5.1 No Action Alternative

Under the No Action Alternative, the approximately 5.5 acre lot would remain in its current condition as a paved parking lot.

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. The no-action alternative would also avoid insignificant environmental impacts that would occur as a result of implementing the proposed project along with appropriate mitigation measures, as discussed in Chapter 3.

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

5.2 Alternative Site Schemes

In the course of developing the proposed Master Plan for the Kakaʻako Makai Innovation Block, the design team considered several different alternative strategies for organizing the site. The alternative site schemes explored are described below, and are shown in further detail in Appendix D.

The initial Schemes A, B, and C explored different locations of and relationships between the five major buildings.

With further feedback from HCDA and HTDC, the subsequent Schemes D, E, F, and G followed a common approach of locating the Entrepreneur's Sandbox, Innovation Hale, and Kewalo Incubation Center near Ilalo Street with the Learning Center sited toward the Makai end of the block. These site options also tested variations on the operational relationships between the Sandbox, Innovation Hale, and Incubation Center as well as the likely construction phasing.

Scheme H confirmed two key priorities for HCDA and HTDC:

- Phase 1 of construction should be composed of the Sandbox and Innovation Hale, and
- The two buildings should be positioned to avoid the utility easements bisecting the site and therefore minimize the required site utility costs for Phase 1.

Scheme H also verified that the Innovation Hale should have frontage along Ilalo Street and would function as an intermediate element between the Sandbox and Incubation Center facilities. Finally, the central location of the public plaza location in this scheme was seen as serving as the "front door" of the Innovation Block.

As part of the Master Plan development process, preliminary massing studies were performed to examine the visual impact of the building volumes on the site as well as the spatial quality of the outdoor gathering areas.

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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. As the project area was once coastal shallows and is comprised of fill land makai of Ala Moana Boulevard, it is unlikely that there are any cultural properties and/or human skeletal remains. In the event of unexpected discovery of historic or archaeological resources, the SHPD will be immediately notified for appropriate response and action.

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

The proposed project will not curtail the range of beneficial uses of the environment.

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

The proposed project does not conflict with the long-term environmental policies, goals, and guidelines of the State of Hawai'i. As presented in this EA, any potential temporary impacts associated with short-term construction-related activities will be mitigated through adherence to standard construction impact mitigation practices.

(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 a platform that will facilitate the growth and development of the tech industry in Hawaii.

(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 have served the urban/industrial center of Sand Island for many years, and 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 from the project area. Rare, threatened, or endangered fauna are not known to utilize the site for either habitat or foraging purposes. Once project activities are complete, faunal activity in the vicinity of the work site is expected to return to pre-existing conditions.

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 Hawaiʻi 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.

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.

Land disturbing activities include demolition, foundation work, utility repairs and 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 Innovation Block at Lot C Master Plan improvements will not degrade lateral coastal views or mauka-makai views from areas in the vicinity of the site. The vertical components of the proposed facility will be consistent with the visual character of the surrounding uses.

(13) *Requires substantial energy consumption.*

The construction and operation of the proposed project will not require a significant level of energy consumption. The primary demand for energy will be for night-time security lighting.

7. CONSULTATION

7.1 Pre-Assessment Consultation

The following agencies and organizations were consulted during the preparation of the Draft EA. Of the 22 parties that formally replied during the pre-assessment period, some had no comments while others provide substantive comments as indicated by the ✓ and ✓✓, respectively. All written comments are reproduced in Appendix D.

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 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
✓✓ Office of Environmental Quality Control
Office of Hawaiian Affairs
✓✓ Office of Planning
✓ University of Hawaiʻi at Mānoa Environmental Center

City Council

Councilmember Ann Kobayashi

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 Hawaiʻi
Hawaiʻi Gas
✓ Hawaiian Electric Company
✓ Hawaiian Telcom
Oceanic Cable

Other Interested Parties and Individuals

Ala Moana – Kakaʻako Neighborhood Board No. 11

APPENDIX A:

Archaeological Literature Review
and Field Inspection
Cultural Surveys Hawaii, June, 2015.

Draft

Archaeological Literature Review and Field Inspection for the Hawaii Technology Development Corporation Innovation Center (HTDC) at Lot "C," *Makai* Area of the Kaka'ako Community Development District, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu TMK: [1] 2-1-015:052

Prepared for
Wilson Okamoto Corporation

Prepared by
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and
David W. Shideler M.A.

Cultural Surveys Hawai'i, Inc.
Kailua, Hawai'i
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Management Summary

Reference	Archaeological Literature Review and Field Inspection for the Hawaii Technology Development Corporation Innovation Center (HTDC) at Lot "C," *Makai* Area of the Kaka'ako Community Development District, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu TMK: [1] 2-1-015:052
Date	June 2015
Project Number (s)	Cultural Surveys Hawai'i (CSH) project job code KAKAAKO 170
Investigation Permit Number	CSH is presently carrying out archaeological studies under State Historic Preservation Division (SHPD) permit number 15-03.
Project Location	The study area is located in central, coastal Honolulu on the central/ east portion of the south shore of O'ahu. The project area lies *makai* (seaward) of the Ala Moana Boulevard/Nimitz Highway alignment in the Kaka'ako *makai* area and is bounded on the *mauka* (inland) or north side by Ilalo Street, on the east side by Keawe Street, on the south side by a large warehouse associated with Pier 1 and on the west side by Forrest Avenue.
Land Jurisdiction	State of Hawai'i
Agencies	This study was prepared to facilitate planning and possibly consultation with the SHPD.
Recommendations	The project area was clearly coastal shallows until being filled in during the early twentieth century (possibly in 1911). No in situ subsurface cultural resources pre-dating ca. 1911 would be expected. It is possible, however, that subsurface remnants of a seawall dating to 1894 are present in the extreme northwest corner of the project area. It is possible subsurface remnants of a seawall dating to close to 1911 may extend along the seaward edge of the project area. The twentieth century fill deposits that make up the present project area are believed to have originated primarily in dredged material from the construction of Kewalo Basin and Honolulu Harbor and thus is anticipated to be relatively free of artifacts as might be found in terrigenous fill materials. In the past, CSH would have been inclined to recommend no further archaeological study for such an area of twentieth century fill. Recently, however, the SHPD has been inclined to ask for archaeological monitoring programs for developments in such areas citing the possibility of early twentieth century subsurface cultural resources. Early consultation with the SHPD is recommended to ensure SHPD directives can be complied with in a timely manner.

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Section 1 Introduction

1.1 Project Background

Cultural Surveys Hawai‘i (CSH) was hired by Wilson Okamoto Corporation to prepare an archaeological literature review and field inspection (LRFI) study for the Hawaii Technology Development Corporation Innovation Center (HTDC) at Lot “C,” *Makai* Area of the Kaka‘ako Community Development District, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu (TMK: [1] 2-1-015:052).

The purpose of the present study is primarily documentation of the history of land use with an evaluation of the potential for cultural resources within the project area. The present project is not intended to fulfill standard SHPD requirements for archaeological inventory surveys (AIS) but is intended for planning and consultation purposes. As part of the purpose of this study was documentation of the quite recent history of land creation, it may be that no, or minimal, further study may be appropriate.

1.2 Scope of Work

The scope of work for this study includes the following:

1. Historical research to include study of archival sources, historic maps, Land Commission Awards (LCAs) and previous archaeological reports to construct a history of land use and to determine if archaeological sites have been recorded on or near this property.
2. Limited field inspection of the project area to identify any surface archaeological features and to investigate and assess the potential for impact to such sites. This assessment will identify any sensitive areas that may require further investigation or mitigation before the project proceeds.
3. Consultation with the SHPD as necessary to address concerns related to the Kaka‘ako Pumping Station.
4. Preparation of a report to include the results of the historical research and the limited fieldwork with an assessment of archaeological potential based on that research, with recommendations for further archaeological work, if appropriate. It will also provide mitigation recommendations if there are archaeologically sensitive areas that need to be taken into consideration.

1.3 Overview of Present Conditions in the Project Area

The study area lands were shallow coral reefs under water at high tide until land fill efforts of the early twentieth century.

The study area is part of the John A. Burns School of Medicine (JABSOM) *makai* campus located in central, coastal Honolulu on the central/east portion of the south shore of O‘ahu. The project area lies seaward of the Ala Moana Boulevard/Nimitz Highway alignment in the Kaka‘ako *makai* area and is bounded on the *mauka* (inland) or north side by Ilalo Street, on the

east side by Keawe Street, on the south side by a large warehouse associated with Pier 1 and on the west side by Forrest Avenue and is depicted on a 1998 U.S. Geological Survey (USGS) topographic quadrangle (Figure 1), a tax map plat (Figure 2), and a 2013 aerial photograph (Figure 3). An existing site plan is presented in Figure 4. Fort Armstrong and Pier 1 of Honolulu Harbor lie to the southwest and west. The Kaka‘ako Waterfront Park is adjacent to the southeast.

1.4 Project Description

This project description is derived from provided master plan documents. The Hawaii Community Development Authority (HCDA) desires to develop the 5.511-acre site (240,059 sq ft), referred to as Lot “C” (TMK [1] 2-1-015:052), located in the *makai* (seaward) area of the Kakaako Community Development District. The presently proposed development of the project area is shown in a plan view (Figure 5) and in a conceptual rendering (Figure 6). The development will improve the entire site and is intended to include the following facilities:

- Entrepreneur’s Sandbox (approximately 13,500 SF)
- Innovation Hale (approximately 150,000 SF)
- Kewalo Incubation Center (KIC) (approximately 47,000 SF)
- Learning Center (approximately 140,000 SF)
- Regional Parking Garage (approximately 900 stalls)

Initial work will include the Entrepreneur’s Sandbox and Innovation Hale:

The Entrepreneur’s Sandbox is intended to provide community spaces and resources that will encourage informal meetings and discussions, exchange of innovative ideas, and provide areas for educational venues. Facilities may include a creative lab, digital media production studio, training room, video conference room, HTDC mentor offices, “phone booth” areas, offices, meeting rooms, kitchen and break room, restrooms and horizontal and vertical circulation.

The Innovation Hale will be co-developed through a partnership between HTDC and a private developer, and is comprised of a five-story commercial tower erected on top of a two-story, low-rise commercial warehouse. The five-story tower will house approximately 73,000 SF of commercial office space, and the two-story warehouse will contain approximately 77,000 SF of commercial retail space.

Parking for the Entrepreneur’s Sandbox will include approximately 14 off-street, on-grade parking stalls, and the Innovation Hale will include approximately 249 off-street parking stalls. Until the proposed regional parking garage is built, provisions will also be made to accommodate parking on the site for the JABSOM and UHCC. Utility relocations will also be required, including a major drainage line through the site that will be relocated after the first phase of developing the Entrepreneur’s Sandbox and Innovation Hale. Installation of traffic signals may also be required after the first phase.

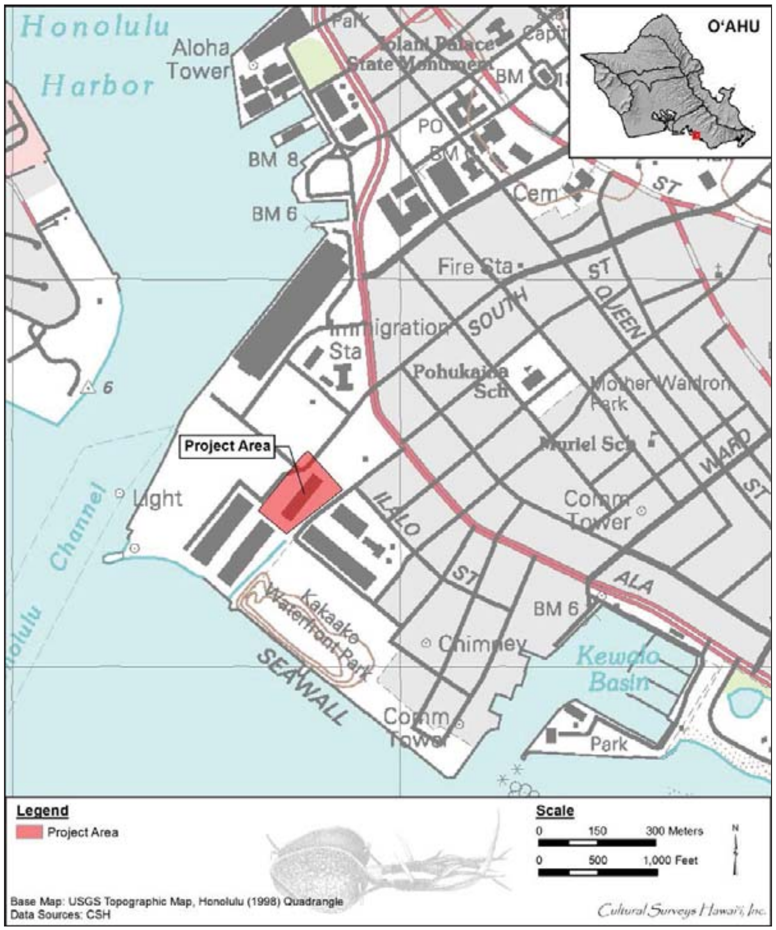

Figure 1. Portion of 1998 Honolulu USGS 7.5 minute series topographical quadrangle, showing location of project area

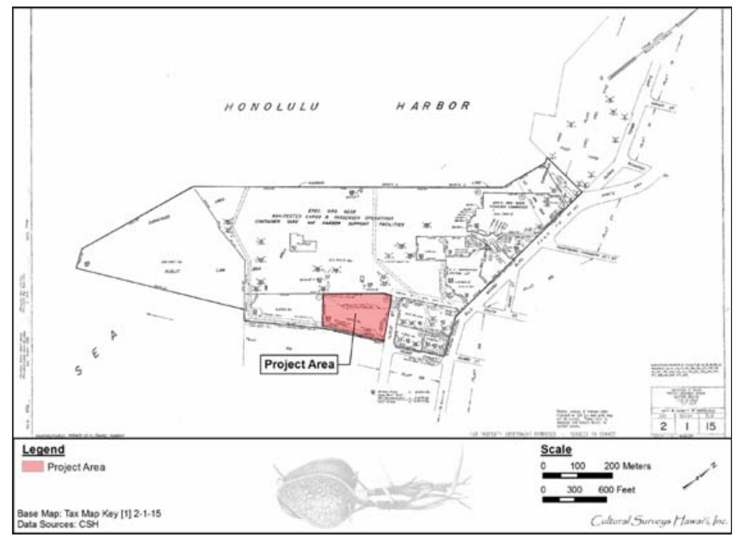

Figure 2. Hawai'i Tax Map Key (TMK) [1] 2-1-015, showing study area (Hawai'i TMK Service)

Figure 3. Aerial photograph showing study area (Google Earth 2013)

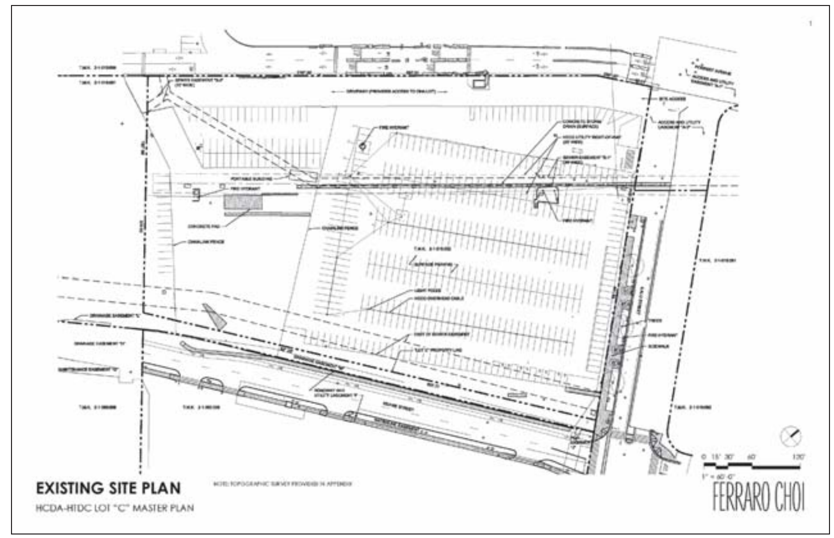

Figure 4. Existing Site Plan for HCDA Lot “C”

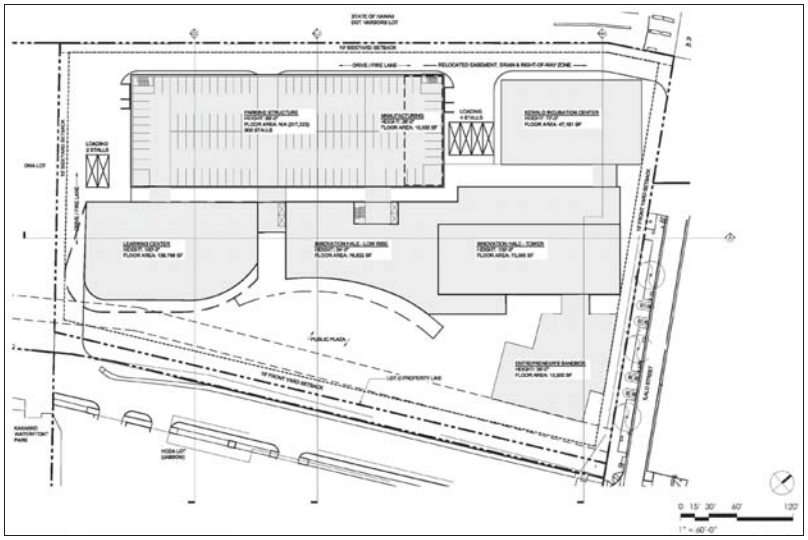

Figure 5. Proposed final build-out for HCDA Lot "C"

Figure 6. Conceptual rendered view of final build-out for HCDA Lot "C"

1.5 Environmental Setting

1.5.1 Natural Environment

The entire study area lies on land created relatively recently. Soil maps indicate all of the land is “Fill Land Mixed” (“FL”; Figure 7) (Foote et al. 1972). While many residents of Honolulu may think of this Kaka‘ako *makai* area as dominated by parking lots, warehouses, and office buildings, in fact much is dedicated to parks including the large Kaka‘ako Waterfront Park and Makai Gateway Park (a large park occupying two blocks between Cooke Street and Ohe Street).

1.5.2 Built Environment

The project area vicinity is traversed by a grid of streets including north/south (*mauka/makai*) trending streets (from west to east), Channel Street, Forrest Avenue, Keawe Street, Coral Street, Cooke Street, Ohe Street, Koula Street, and ‘Āhui Street, and east/west (‘Ewa/Diamond Head) trending streets (from north to south), Ilalo Street, Kelikoi Street, and Olomehani Street. Major enterprises in the area include National Marine Fisheries Service facilities, the former Fisherman’s Wharf Restaurant, the 53 by the Sea Restaurant, the Children’s Discovery Center, Fort Armstrong with the U.S. Immigration Station and GSA Motorpool, Pier 1, the Gold Bond Building, the Cancer Research Center of Hawai‘i, and the John A. Burns School of Medicine in Kaka‘ako. Kewalo Basin located 600 m to the southeast is one of the major commercial boat harbors of Honolulu. The project area per se is a paved parking lot.

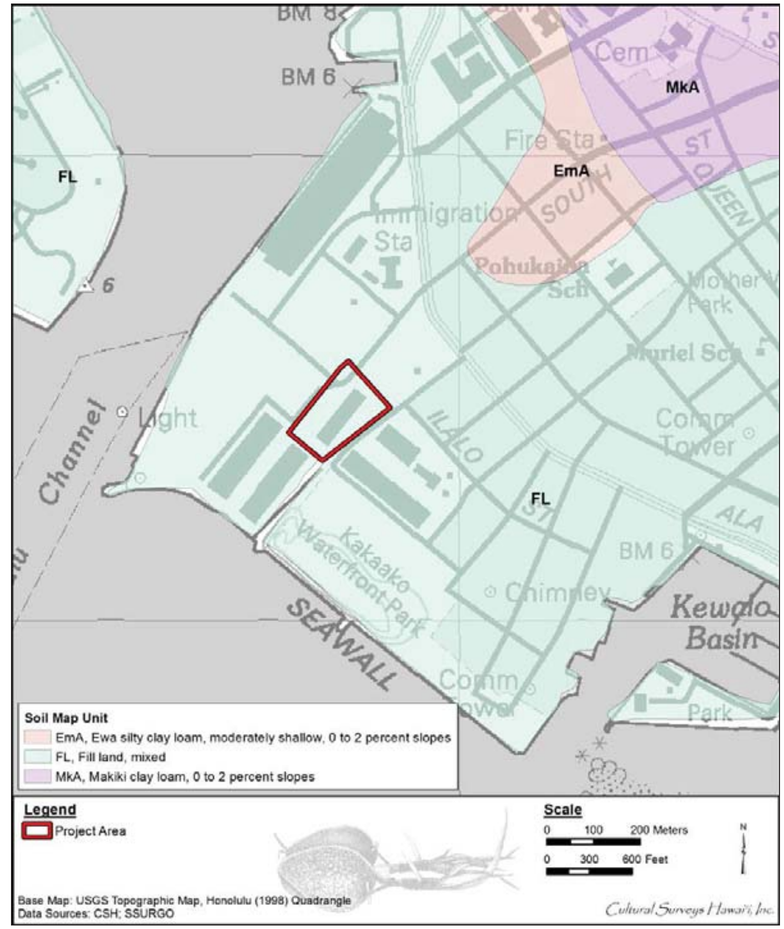

Figure 7. Soils map of Kaka‘ako *makai* (Foote et al. 1972)

Section 2 Background Research

The project vicinity is located in an area today often called Kewalo, due to the proximity to Kewalo Basin. On early historic maps, the project vicinity is more specifically identified with the place names "Kukuluāe‘o" on the east (roughly east of an imaginary *mauka* extension of ‘Āhui Street) and "Ka‘ākaukukui" on the west (roughly west of an imaginary *mauka* extension of ‘Āhui Street). The traditional area called Kewalo was generally considered the area *mauka* of Kukuluāe‘o and Ka‘ākaukukui, although it had a small beach area near the eastern terminus of Queen Street (two blocks west of Ala Moana Center). For the purpose of this study, the name Kewalo is used as it is the name most often used today for the area in general.

2.1 Pre-Contact to Early Nineteenth Century

Kewalo was situated between two centers of population and activity on the southern shore of pre-Contact O‘ahu: Kou and Waikīkī. In Waikīkī, a system of irrigated taro *lo‘i* fed by streams descending from Makiki, Mānoa, and Pālolo valleys blanketed the plain, and networks of fishponds dotted the shoreline. Similarly, Kou—the area of downtown Honolulu on the east side of Nu‘uanu Stream and extending to the southeast adjacent to the harbor—possessed shoreward fishponds and irrigated fields watered by ample streams descending from Nu‘uanu and Pauoa valleys.

Rev. Hiram Bingham, arriving in Honolulu in 1820, described a still predominantly Native Hawaiian environment—still a "village"—on the brink of western-induced transformations:

> We can anchor in the roadstead abreast of Honolulu village, on the south side of the island, about 17 miles from the eastern extremity. . . . Passing through the irregular village of some thousands of inhabitants, whose grass thatched habitations were mostly small and mean, while some were more spacious, we walked about a mile northwardly to the opening of the valley of Pauoa, then turning southeasterly, ascending to the top of Punchbowl Hill, an extinguished crater, whose base bounds the northeast part of the village or town . . . Below us, on the south and west, spread the plain of Honolulu, having its fishponds and salt making pools along the seashore, the village and fort between us and the harbor, and the valley stretching a few miles north into the interior, which presented its scattered habitations and numerous beds of *kalo* (arum esculentum) in its various stages of growth, with its large green leaves, beautifully embossed on the silvery water, in which it flourishes. [Bingham 1981:92–93]

The Kewalo region would have been in Bingham's view as he stood at "Punchbowl Hill" looking toward Waikīkī to the south: it would have comprised part of the area he describes as the "plain of Honolulu" with its "fishponds and salt making pools along the seashore."

Another visitor to Honolulu in the 1820s, Jacobus Boelen, hints at the possible pre-Contact character of Honolulu and its environs, including the Kewalo area:

> It would be difficult to say much about Honoruru. On its southern side is the harbor or the basin of that name (which as a result of variations in pronunciation [*sic*] is also written as Honolulu, and on some maps, Honoonoono). The

> landlocked side in the northwest consists mostly of tarro fields. More to the north there are some sugar plantations and a sugar mill, worked by a team of mules. From the north toward the east, where the beach forms the bight of Whytetee, the soil around the village is less fertile, or at least not greatly cultivated. [Boelen 1988:62]

Boelen's description suggests preliminarily that the Kewalo region *mauka* of the present study area is within a "not greatly cultivated" region of Honolulu perhaps extending from Puowaina (Punchbowl crater) at the north through Kaka‘ako to the Kālia portion of Waikīkī in the east. Kewalo is named in John Papa ‘Ī‘ī's account of the death in 1810 of Isaac Davis, an American sailor who had settled in the Hawaiian Islands, becoming a confidant of Kamehameha:

> Many chiefs and notables mourned Davis, including Kamehameha and the company of warriors who watched over him. The funeral procession went from Davis' dwelling at Aienui to Kewalo, where his body was deposited on the land of Alexander, a haole who had died earlier. At the time of his death, Davis was an old man with white hair and other signs of age. [‘Ī‘ī 1959:85]

The distance inland (perhaps in the vicinity of the King and Pi‘ikoi Street intersection) supports the concept that the place name "Kewalo" was widely used to refer to areas further inland than we associate with the place name today. An article about Davis in *The Friend* of February 1862 mentions only that his grave was "in a burying place of the Europeans, near Hana-rura," suggesting the Kewalo region and the "burying place" were outside the limits of Honolulu both at the time of Davis's death and 42 years later when the article was written.

An early, somewhat generalized depiction of the pre-Contact Native Hawaiian shaping of Waikīkī, Honolulu, and the Kewalo region—along with a possible location of the "burying place of the Europeans" within Kewalo (southeast of Punchbowl)—is given on an 1817 map (Figure 8) by Otto von Kotzebue, commander of the Russian ship *Rurick*, who had visited O‘ahu the previous year. The map shows taro *lo‘i* (the rectangles) massed around the streams descending from Nu‘uanu and Mānoa valleys. The depicted areas of population and habitation concentration (indicated by the trapezoids), however, probably reflect distortions caused by the post-Contact shift of Hawaiians to the area around Honolulu harbor—the only sheltered landing on O‘ahu and the center of increasing trade with visiting foreign vessels. Kamehameha himself had moved from Waikīkī to Honolulu in 1809.

Kotzebue's map (see Figure 8) suggests the land between Puowaina (Punchbowl crater) and the shoreline—which would include the Kewalo area—formed a "break" between the heavily populated and cultivated centers of Honolulu and Waikīkī: the area is only characterized by fishponds, trails connecting Honolulu and Waikīkī, and occasional taro *lo‘i* and habitation sites. We believe the quite early (1817) Kotzebue map erroneously portrays the east side of Honolulu Harbor too far to the west, but a geo-referenced overlay of the present project area does place it within coastal shallow. The Malden map of 1825 (Figure 9) shows a high degree of consistency in depictions of the natural coastline as very close to the present Ala Moana/Nimitz alignment.

Most maps of the nineteenth century (Malden 1825, see Figure 9; LaPasse 1855, Figure 10; Lyons 1876, Figure 11; Oahu Island Government Survey 1881 map, Figure 12; Oahu Government Survey 1884 map, Figure 13) show the present project area and vicinity quite

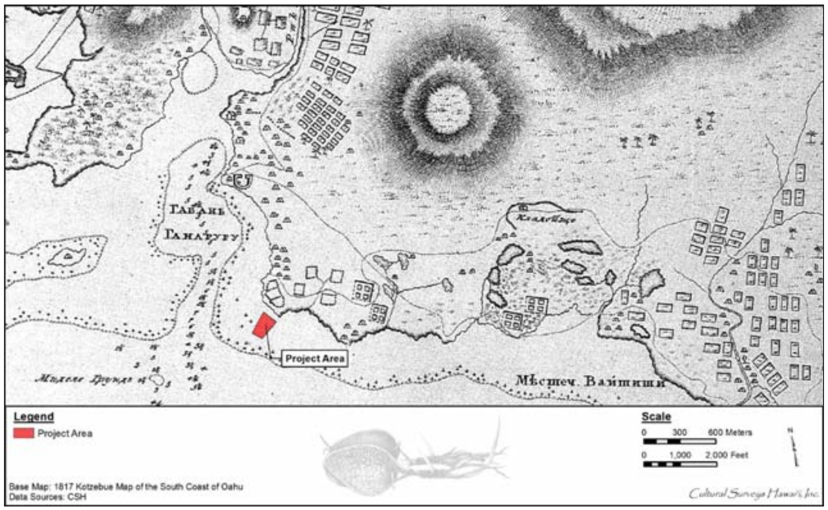

Figure 8. Portion of 1817 map by Otto von Kotzebue, commander of the Russian ship *Rurick*, showing study area; this early map probably should be understood as schematic sketch (map reprinted in Fitzpatrick 1986:48–49)

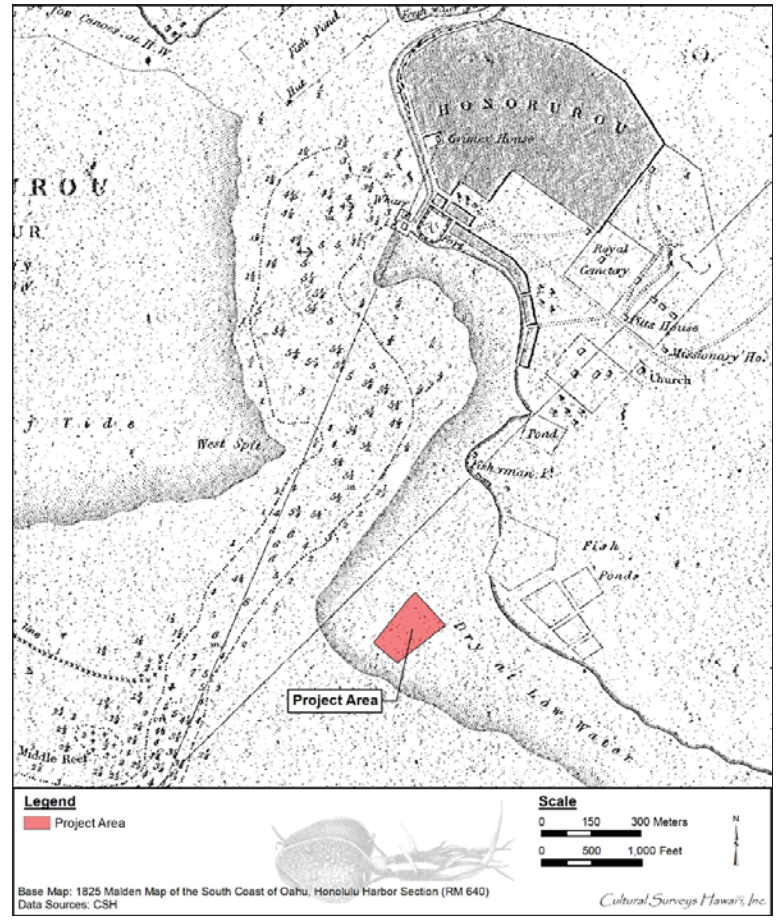

Figure 9. Portion of 1825 map of "South Coast of Woahoo and Honorurou Harbour" by Lt. Charles Malden, showing study area; this and later nineteenth century maps show the natural dry land coastline fairly consistently as very close to the present Ala Moana/Nimitz alignment

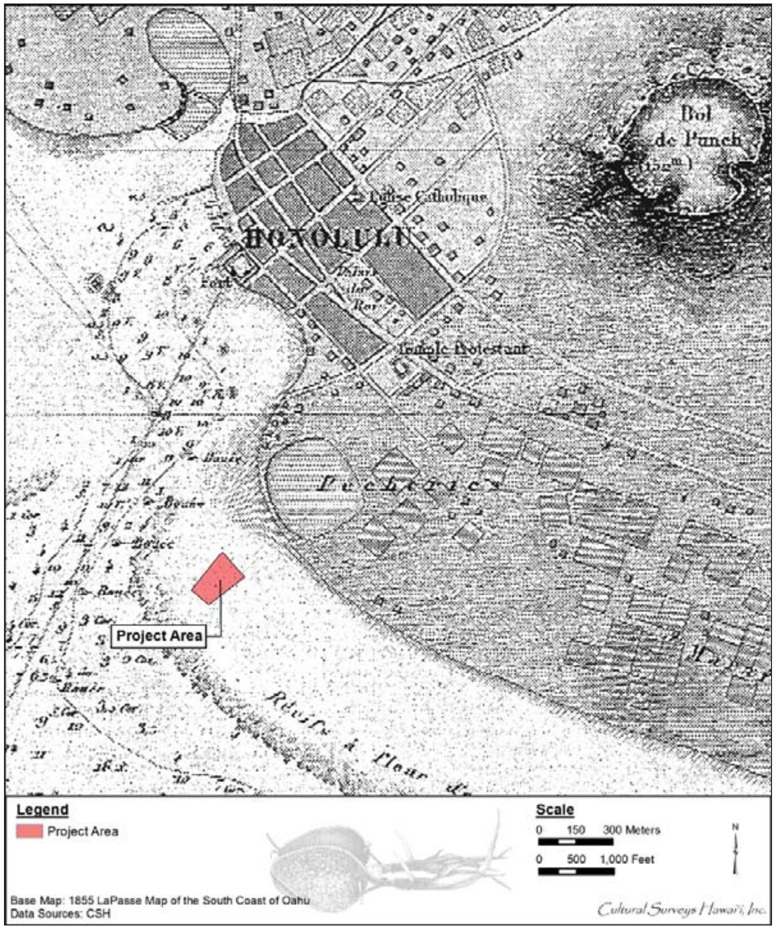

Figure 10. Portion of 1855 map of Honolulu by Lt. Joseph de LaPasse of the French vessel, *L'Eurydice*; project area adjacent to area labeled "*Pecheries*" ("Fishponds") (map reprinted in Fitzpatrick 1986:82–83)

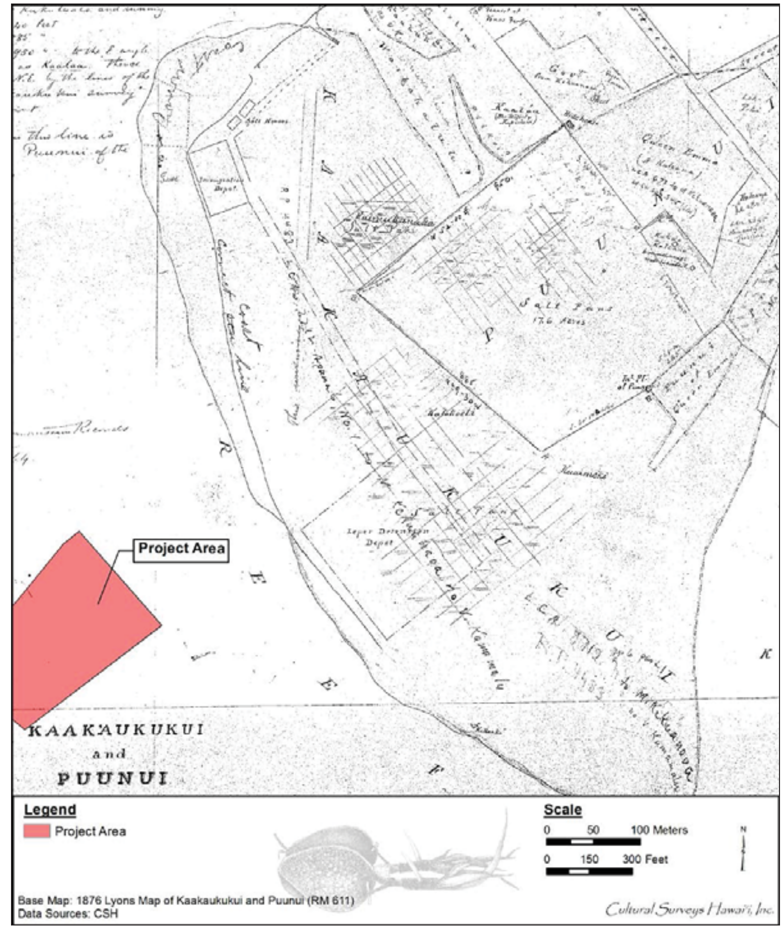

Figure 11. 1876 Lyons map of Kaakaukukui and Puunui

Figure 12. Portion of 1881 Oahu Island Government survey map by R. Covington, showing study area; note extensive "Kakaako Salt Works" just inland of the present study area

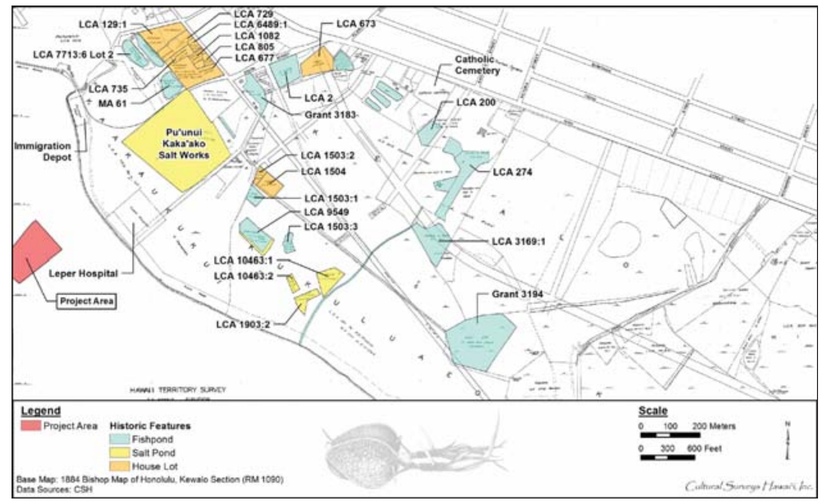

Figure 13. 1884 map of Honolulu, Kewalo Section map, by Sereno Bishop, showing Land Commission Awards within the study area; note in the extreme northern tip of the study area the Waikahalu'u lands filled in ca. 1887

similarly. Most notably these maps show the present study area as being in the water (albeit mostly within a shallow reef flat that may have been partially exposed at low tide). *Mauka* of the project area near the former coast, these maps often show polygons or hatching that do not appear to relate to the cartographer's conventions for fishponds or taro *lo‘i*. At least a partial explanation is suggested by the Lyons map of 1876 (see Figure 11) and the Oahu Island Government Survey 1881 map (see Figure 12) that show a quite extensive "Kaka‘ako Salt Works" just inland (northeast) of the present study area. The salt works continued until well into the twentieth century (Figure 14). This suggests that even the lands well inland of the present study area were quite low-lying until overlain with fill.

While the low-lying lands to the northeast of the project area may have been somewhat bleak salt flats and "salt works," it appears that a vibrant coastal community may have existed 400 m north of the present study area. It appears likely the community depicted in the sketch of "Honolulu Beach" by G.H. Burgess in the mid-1850s (Figure 15) relates to the coastal houses depicted on the 1855 LaPasse map.

2.2 Mid-Nineteenth Century and the Māhele

Among the first descriptions of Kaka‘ako and Kewalo by the Hawaiians themselves are testimonies recorded during the 1840s in documents associated with land awards and awardees of the Māhele, the division of lands conducted by the government that introduced a system of private property into Hawaiian society. These records bring the present study area into clearer focus. A portion of a modern tracing of an 1884 map by S.E. Bishop (see Figure 13) shows the disposition of Land Commission Awards (LCAs) granted in the environs of the study area. The tracing includes some modern streets not present in 1884. These additions, however, permit an accurate positioning of the study area on the 1884 map. This general depiction is believed to be quite accurate, with the annotated "Beach Road" that runs along the edge of the sea becoming the present Ala Moana Boulevard/Nimitz Highway alignment.

The *‘ili* (land division smaller than an *ahupua‘a*) of Ka‘ākaukukui (LCA 7713) was awarded to Victoria Kamāmalu, sister of Kamehameha IV and Kamehameha V. There were no awards to commoners in this *‘ili*, which seems to have consisted entirely of land used for salt making. No residences are shown in this area until the twentieth century. The largest settlement in the vicinity was the village of Honuakaha, at the corner of Punchbowl and King streets. A large number of house lots were awarded to commoners in this area, and late nineteenth century and early twentieth century maps always show a cluster of houses in this area.

The *‘ili* of Kukuluāe‘o was originally awarded to the king as LCA 387, but he returned it to the government. The *‘ili* was then awarded to the American Board of Commissioners for Foreign Missions (ABCFM) (see Figure 13). Initially this land was associated with Punahou School in Mānoa Valley, as Chief Boki gave the Punahou lands to Hiram Bingham, pastor of Kawaiaha‘o Church in 1829 (DeLeon 1978:3). In the Māhele, however, this land became "detached" from the Mānoa award and was instead given to the pastor of the Kawaiaha‘o Church (Foster 1991).

Testimonies describe the land—identified as "Punahou" (relating to the main ABCFM holding)—and the background of the ABCFM's claim to it:

Figure 14. 1902 photograph of the Kewalo Brine Basins; the Kaka‘ako salt works may have extended back to pre-Contact times and are shown here going strong in 1902; photo in the general vicinity of today's Ward Warehouse (photograph in Scott 1968:579)

Figure 15. This sketch of “Honolulu Beach” by G.H. Burgess in the mid-1850s (from Scott 1968:575) portrays a scene just west of the present study area roughly between Pier 5 (foreground) and Fort Armstrong (at extreme right); note the dense thatched houses are constructed surprisingly close, within 10 m or so of the high tide line

> The boundaries of that part which lies on the sea shore we cannot define so definitely, but presume there will be no difficulty in determining them, as it is commonly known as pertaining to Punahou. This part embraces fishing grounds, coral flats and salt beds.
>
> The above land was given by Boki to Mr. Bingham, then a member of the above named Mission and the grant was afterwards confirmed by Kaahumanu. [*Foreign Register* 1842:2:33]
>
> The *Makai* part of Punahou is bounded *Mauka* by ‘Kewalo’ and ‘Koula’, Waititi side by ‘Kalia’, seaward it extends out to where the surf breaks. Honolulu side by ‘Honolulu.’
>
> This land was given to Mr. Bingham for the Sandwich Island Mission by Gov. Boki in 1829 . . . From that time to these the S.I. Mission have been the only Possessors and Konohikis of the Land.
>
> The name of the *Makai* part is Kukuluaeo. There are several tenants on the land of Punahou whose rights should be respected. [*Foreign Testimony* 1848:3:115]

The *‘ili* of Kewalo (LCA 10605) was awarded to Kamake‘e Pi‘ikoi, wife of Jonah Pi‘ikoi (awardee of Pualoalo ‘Ili), as part of LCA 10605, *‘āpana* (lot) 7. The award was shared between husband and wife (Kame‘eleihiwa 1992:269). Kewalo was a large 270.84-acre land section extending from Kawaiaha‘o Church to Sheridan Street. This land section had numerous large fishponds, which were awarded as part of the claim to Pi‘ikoi.

That the area inland of the present study area was indeed exposed coral flats dotted with salt pans and fishponds well into the nineteenth century is corroborated in the testimonies recorded for individual *kuleana* awards to some of the commoners on that land “whose rights should be respected.”

LCA 1503 to Puaa is recorded as consisting of three fishponds and a house lot.

LCA 1504 to Pahiha (Pahika on the 1884 map) explicitly defines the general area:

> Peka W. [wahine] sw. I know this place. It is on the salt plains of Honolulu, used for making salt.
>
> *Mauka* is a stream of salt water. Waititi is several salt ponds—Napela, Kuniae and others own them. *Makai*—Gov’t road. Honolulu—Peka Kaula, Lilea, Bolabola, Poe.
>
> Claimant recd this land from his father who died last year and held it a long time back in Kinau’s time. [*Foreign Testimony* 1848:3:220]

LCA 9549 to Kaholomoku comprised “three ponds, a salt mo‘o” (Native Register 1847:4:477).

LCA 10463 to Napela is recorded as consisting of “two ponds, a ditch, two deposits, a house site and a salt land section in two pieces” (*Native Testimony* 1848:10:445).

Within Kewalo itself is LCA 3169 to Koalele:

> Mahoe, sworn, says he knows the land of Claimant in 'Kewalo'. It consists of some *kalo* patches *mauka* and some Lokos *makai*.
>
> The *kalo* patches are bounded *mauka* by Kealoha; bound Waikiki side by Kuaipaka's, *makai* by the konohiki, Ewa side by J. Booth.
>
> The fish ponds are bounded *mauka* by the konohiki. Waikiki and *makai* side, the same. Honolulu side by J. Booth.
>
> Clt received his land from Kapihi in the life time of Kinau and he has held the same without dispute till the present time. [*Foreign Testimony* 1848:3:507]

The *mauka* portion of Koalele's claim, which includes the taro patches, is not shown on the 1884 map; it is likely somewhere immediately *mauka* of King Street. The *makai* portion—the "Lokos" or fishponds—is shown located northeast of the present study area.

The LCA records thus help clarify both the pre-Contact and mid-nineteenth century pictures of the study area vicinity. They suggest the traditional Hawaiian usage of the Kewalo region and its environs may have been confined to salt making and farming of fishponds, with minimal wetland agriculture in those areas *mauka* or toward Waikīkī at the very limits of the field system descending from Makiki and Mānoa. The characterization by a Native Hawaiian of the expanse within the present study area as the "salt plains of Honolulu" itself suggests the environmental limitations that would have made the general region less desirable for long-term permanent habitation by any sizeable population. However, the testimonies do indicate the area was lived on and was shaped by Hawaiians before the nineteenth century.

The LCA records also reveal that, midway through the nineteenth century, taro cultivation and the traditional salt making and fishpond farming activities continued within the environs *mauka* of the present study area. These activities and the land features that supported them would be eliminated during the remainder of the nineteenth century by the increasing expansion of urbanized Honolulu.

The 1884 Honolulu Kewalo Section map (see Figure 13) and an 1887 Wall Government Survey map (Figure 16) show the nascent traces of the future development in the grid of roads *mauka* of the project area vicinity. Until quite late in the 1800s, this grid was focused north of King Street and west of Punchbowl Street owing to the low-lying marshy nature of the land.

2.3 Late Nineteenth Century

Of note are changes to the coastal lands starting to the northwest of the project area. In 1857, Honolulu Fort was demolished and its walls became a 2,000-ft retaining wall used to extend the land out onto the shallow reef in the harbor. The remaining materials were used as fill to create what came to be known as the "Esplanade" (Wong-Smith and Rosendahl 1990:12), largely built on properties known as Waikahalu'u that had been owned by Queen Hakaleleponi Kalama (wife of Kauikeaouli Kamehameha III). Between 1857 and 1870, 22 acres of reef land between Fort Street and Alakea Street were filled in with material dredged from the harbor (Rush 1957:14). Filling activity then continued to the east, seaward of Richard and Punchbowl streets, extending west of the present study area in 1887. The 1887 Wall map (see Figure 16) shows the brand new, in-progress, layout of streets in the area between Richards and Punchbowl streets (near the

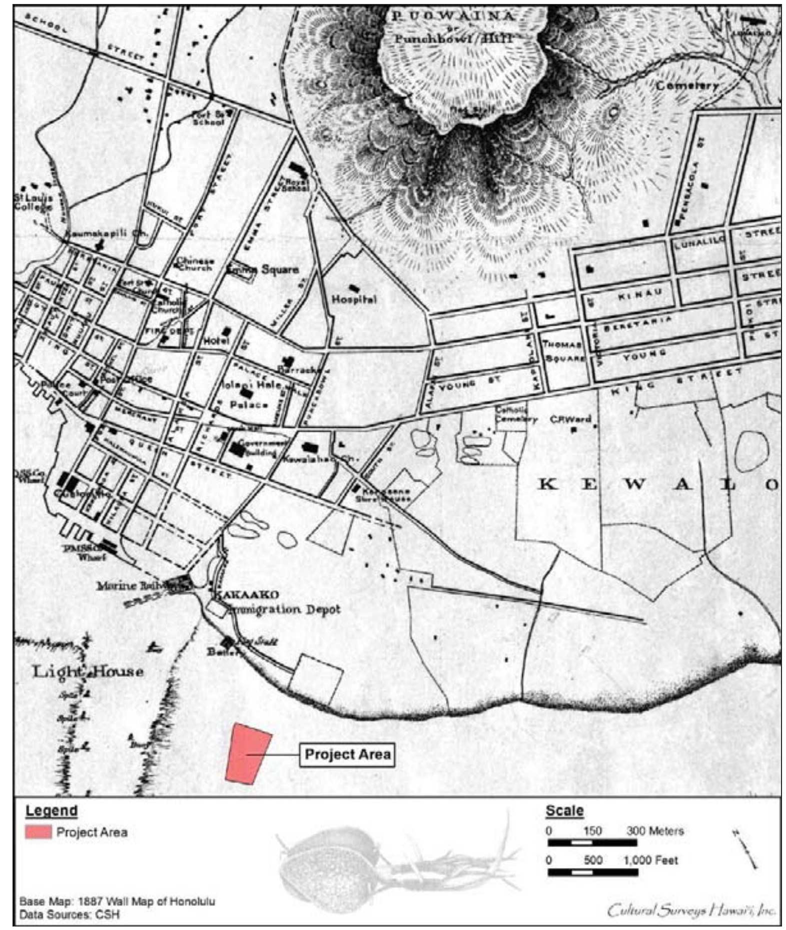

Figure 16. 1887 map of Honolulu and vicinity by W.A. Wall, showing lack of road and residential development in the Kaka'ako area in the late nineteenth century

Prince Kūhiō Federal Building). Thus by 1886/1887 the filling of the shallow seas in the vicinity of the project area had begun but none of the project area was filled at that time.

An 1897 Monsarrat map (Figure 17) indicates there had been very little filling of the coastal shallows in the previous decade. This map shows the development of the coastal area, with commercial wharfs and recreational boathouses built out over the low reef. In 1884–1887, a “Marine Railway” was developed by Lyle and Sorenson in the extreme north end of the present study area (Figure 18) that facilitated the haul out of ships for bottom scrapping and propeller checks.

During the monarchy, the point at Kaka‘ako was the location for a battery, with three cannons (see Figure 16, Figure 19, and Figure 20) used to salute visiting naval vessels, which responded with their own cannon salutes (located approximately 200 m north of the present project area). Other saluting batteries were at the top of Punchbowl Crater and at the Honolulu Fort (Dukas 2004:163). The *Hawaiian Annual and Almanac for 1887* (Thrum 1886:37) reported that $4,500 had been spent to build the battery. It was used for gun salutes up to at least the overthrow of the monarchy in 1893 (Judd 1975:57).

Also of interest is the establishment of a long pier in the waters of the extreme northern portion of the present study area that had branching piers leading to the King’s (Kalākaua’s) Boat House (Figure 21 and Figure 20), Myrtle Boat House (club), and Healani Boat Club House. While outrigger canoes were paddled and sailed, and five-oared whaleboats were raced, the main sport for the rival Myrtle and Healani Boat Clubs was six-oared sliding-seat “barges”—“in addition to things hanky-panky” (Scott 1968:195).

Of note on the 1909 Monsarrat map is a large U-shaped sea wall just south of the boat house pier that may have extended into the northwest corner of the present project area (Figure 22). This sea wall is also visible in a view from Punchbowl of the time (Figure 23). The 1911 Podmore map (Figure 24) shows this area being rapidly developed through land fill (largely filled with sand and coral from Honolulu Harbor dredging operations) to accommodate a new U.S. Naval Reservation, U.S. Immigration Depot, and Fort Armstrong Military Reservation. The Podmore map indicates a “proposed sea wall” extension extending southeast from the initial seawall and roughly parallel to the coast. Virtually all of the fill in the project area thus post-dates 1911.

After the annexation of the Islands by the United States in 1899, the U.S. Congress began to plan for the coastal defenses of their new territory. The major batteries were placed at Pearl Harbor and in Waikīkī, but a small reservation, named Fort Armstrong, was also set up on the Ka‘ākaukukui Reef as a station for the storage of underwater mines (Figure 25). Fort Armstrong (1899–1950s) was named after General Samuel Chapman Armstrong (1839–1893) who was born on Maui and graduated from Punahou, and was a hero of the Union defense of Cemetery Ridge at Gettysburg. Battery Tiernon, with two 3-inch m 1903 guns, was built at this site in 1911, and took over the job of saluting visiting naval vessels once performed by the Kaka‘ako battery (Williford and McGovern 2003:15).

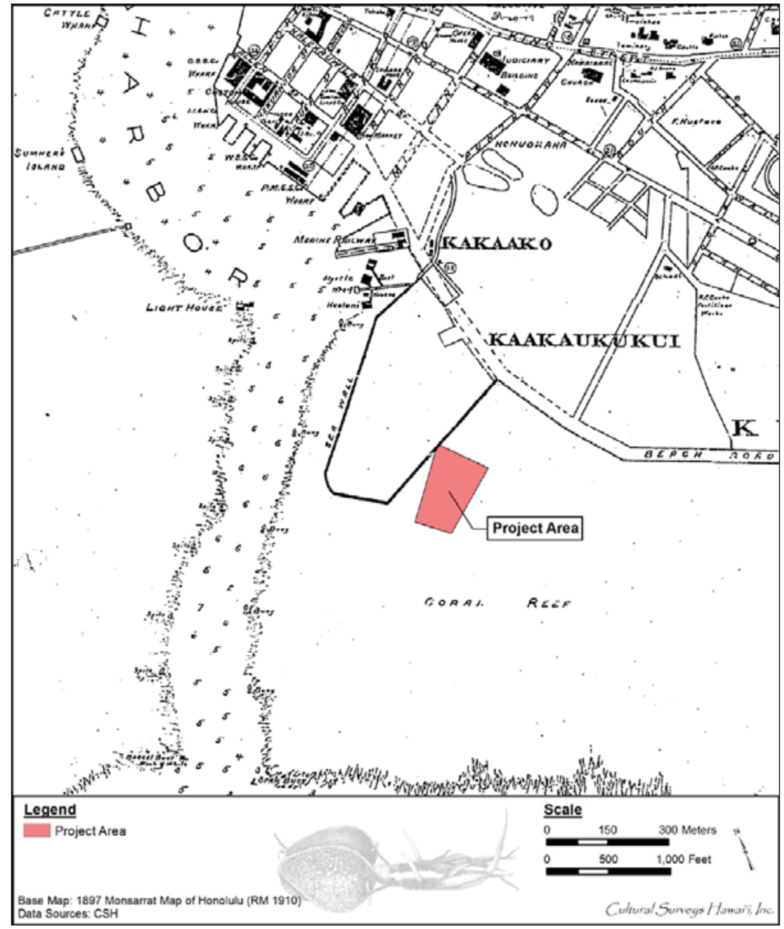

Figure 17. 1897 M.D. Monsarrat map of Honolulu, Hawaiian Islands, showing study area

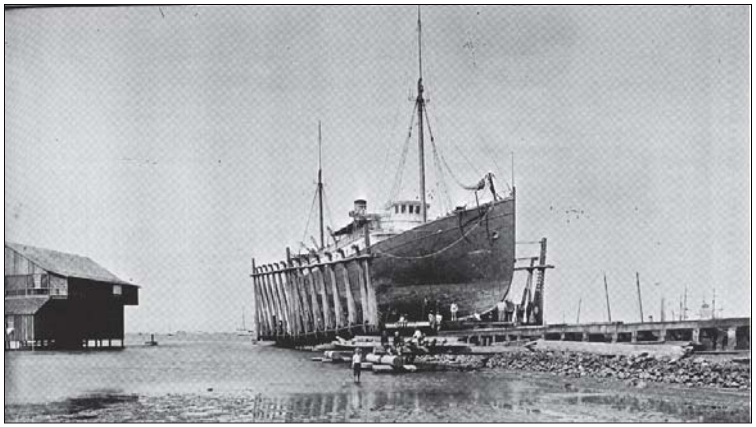

Figure 18. *Kinau* steamer on Lyle and Sorenson’s “Marine Railway” constructed ca. 1885 in the extreme north portion of the study area for the haul out of ships; note the extensive shallow mudflat (original photograph at Hawai‘i State Archives, reprinted in Scott 1968:209)

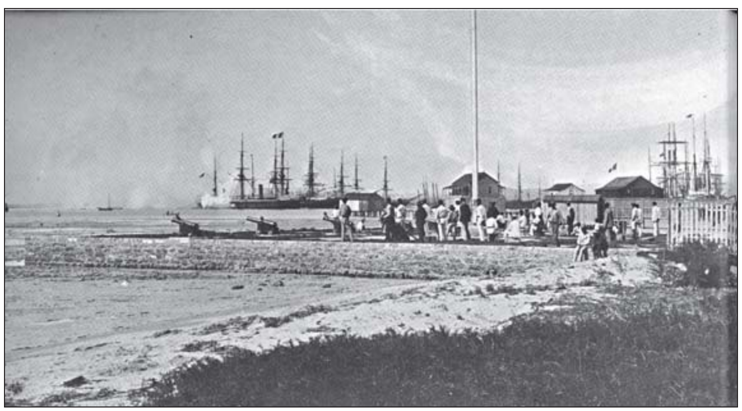

Figure 19. 1887 photograph of the Kaka‘ako Saluting Battery and flagstaff (original photograph taken by Karl Kortum and archived at the San Francisco Maritime Museum; reprinted in Scott 1968:176)

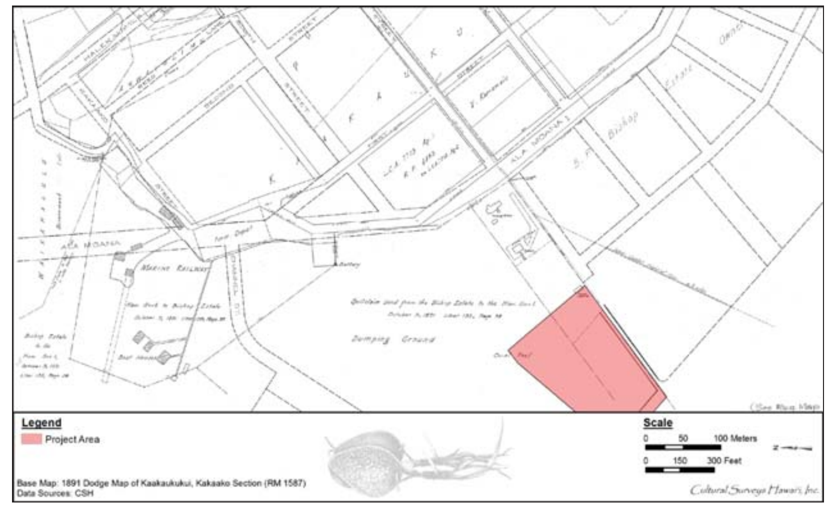

Figure 20. 1891 Dodge map of Kaakaukukui, Kakaako Section (the southeast portion of this map is believed to show planned rather than actual streets)

Figure 21. View of the King's (Kalākaua's) Boathouse 400 m north of the study area ca. 1890; this land would soon be filled in to create the Pier 1 area (Ray Jerome Baker Collection, Kamehameha Schools Archives)

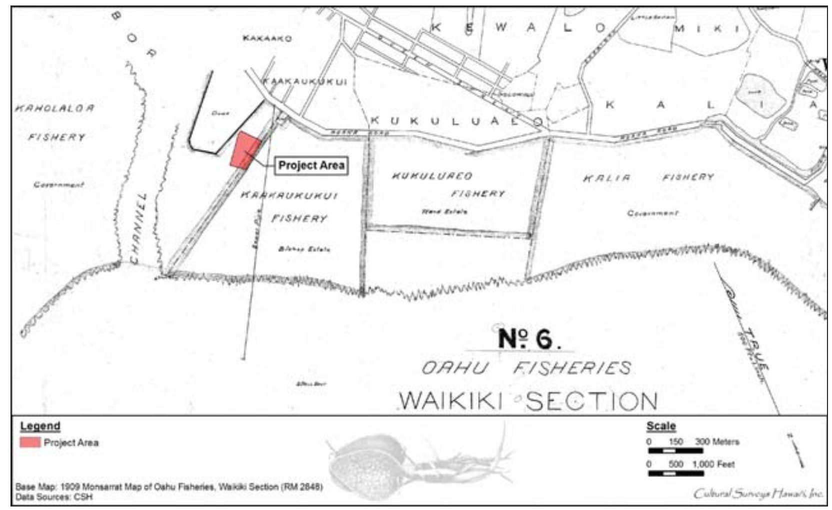

Figure 22. 1909 Monsarrat map of Oahu fisheries, Waikiki Section

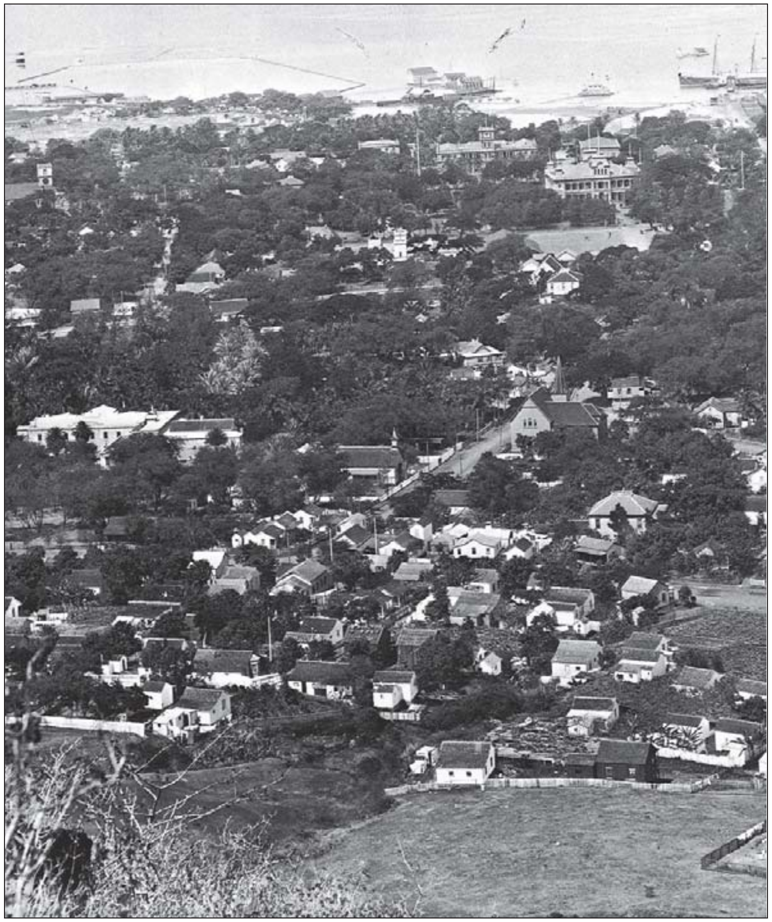

Figure 23. In this 1894 photograph of the Honolulu waterfront taken from the top of Punchbowl (Kawaiaha‘o Church and ‘Iolani Palace are clear landmarks) the new seawall is quite pronounced at the upper left (photograph from Scott 1968:266)

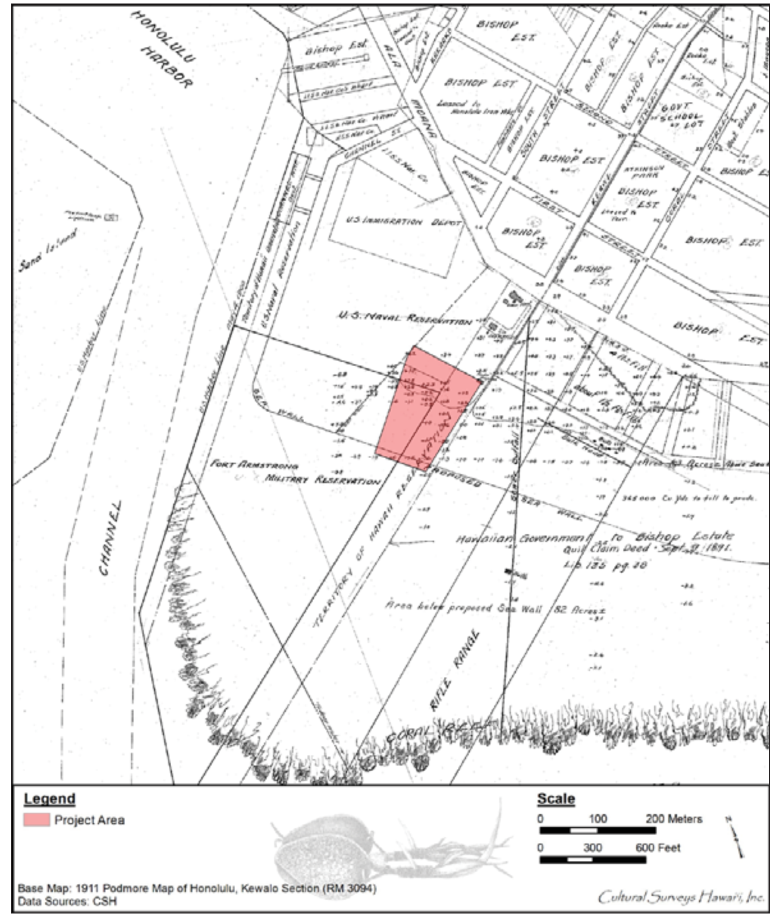

Figure 24. 1911 G. Podmore map of "Honolulu, Kewalo Section," showing study area; note the bounding seawall at the southwest side of the project area is only "proposed" and that depths indicate the *makai* two-thirds of the Lot C project area is in fact underwater

Figure 25. Colorized postcard (ca. 1911-1920) of Fort Armstrong (original black and white photograph at Hawai‘i State Archives; reprinted in Wisniewski 1984:18)

In the 7 December 1941attack on the islands, the fort escaped relatively unscathed; only one motor pool structure was hit. Antiaircraft shells were fired from the fort but were ineffective; at least one hit the town rather than any aircraft (Richardson 2005:34). In the 1950s, the federal government returned most of Fort Armstrong to the Territory of Hawaii, which used the area to expand the shipping piers of the harbor.

2.4 Twentieth Century

A 1919 Fire Control map (Figure 26) by the U.S. Army Corps of Engineers indicates that into the 1920s large portions of Kewalo were yet to be developed. It appears, however, that the southeast extension of the seawall seen in the Podmore map of 1911 (see Figure 24) had been partially developed with Fort Armstrong largely completed on the northwest side and the southeast end of the seawall enclosure still undeveloped (and perhaps largely still under water). The present project area thus appears to have been in-filled between 1911 and 1919. The 1919 map (see Figure 26) shows the Ilalo Street alignment along the *mauka* or north side of the present project area, the Keawe Street alignment being developed on the east side of the project area and three new structures, seemingly associated with the new Fort Armstrong, in the *mauka* portion of the present project area. Active road development adjacent to the northeast of the project area is shown in a 1920 Monsarrat map which also shows sewer infrastructure on the east side of the project area (Figure 27). The new southeastern sea wall extension (built to promote land reclamation) may have bounded the *makai* edge of the present project area but overlays as late as 1961 (see Figure 36) appear to show the southwest edge of the project area as water into the 1960s.

In 1919, the Hawaii Government appropriated $130,000 to improve the small harbor of Kewalo for the aim of “harbor extension in that it will be made to serve the fishing and other small craft, to the relief of Honolulu harbor proper” (Thrum 1920:147). As the area chosen for the harbor was adjacent to several lumber yards, the basin was initially made to provide docking for lumber schooners, but by the time the wharf was completed in 1926, this import business had faded, so the harbor was used mainly by commercial fishermen. The dredged material from the basin was used to fill a portion of the Bishop Estate on the western edge of Waikīkī and some of the Ward Estate in the coastal area east of Ward Avenue (U.S. Department of Interior 1920:52). In 1941, the basin was dredged and expanded to its current 55 acres. In 1955, dredged material was placed along the *makai* side to form an 8-acre land section protected by a revetment.

A 1933 U.S. War Department Fire Control map (Figure 28) shows much of the present Kaka‘ako *makai* area land filled in west of Kewalo Basin but the fill is so recent that the layout of streets is on-going. A large U-shaped building dominates the project area on the 1933 map (see Figure 28), a 1939-1941 aerial photograph (Figure 29), and the 1943 map (Figure 30).

Kewalo Basin has been dredged by this time but the east side is still in reef flats. Whereas much of the fill in the northwest portion of Kaka‘ako *makai* was relatively clean coral and sand dredge material, much of the fill in the southeast portion of Kaka‘ako *makai* came from decades of open trash burning (Figure 31). The 1933 map (see Figure 28) shows a street extending *makai* in the northwest side of the present project area with four streets extending off to the northwest at right angles. This same configuration is shown on the 1943 War Department map (see Figure 30), 1953 USGS map (Figure 32), and 1959 USGS map (see Figure 35). By 1969, this road

Figure 26. Portion of 1919 U.S. Army Fire Control map, Honolulu quadrangle, showing study area

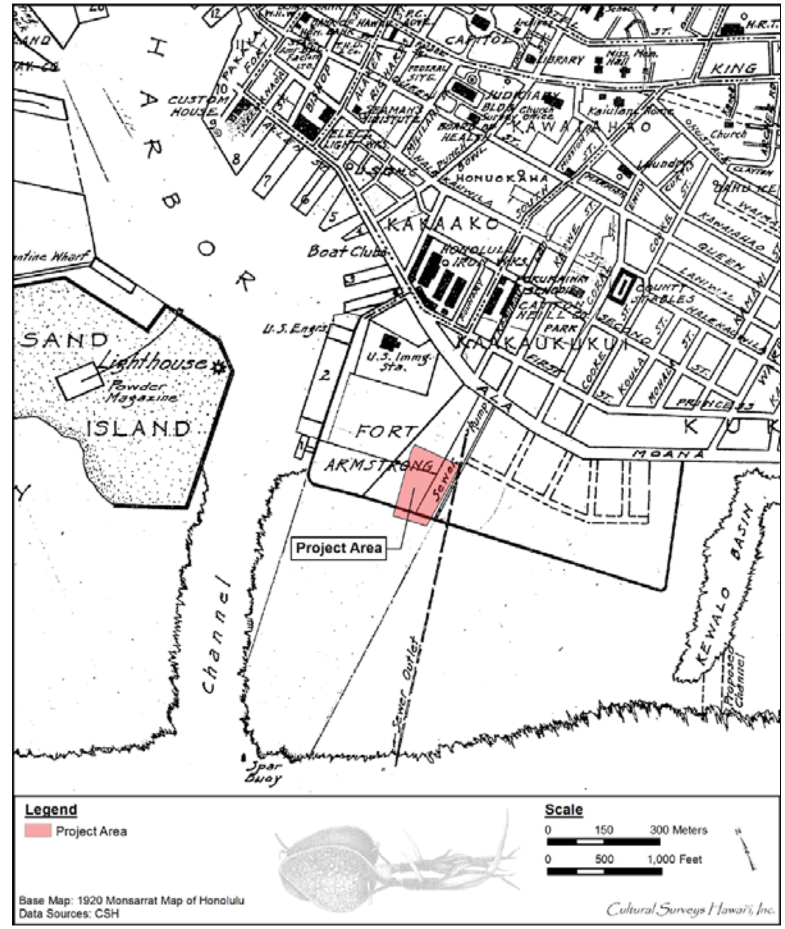

Figure 27. Portion of 1920 Monsarrat map of Honolulu

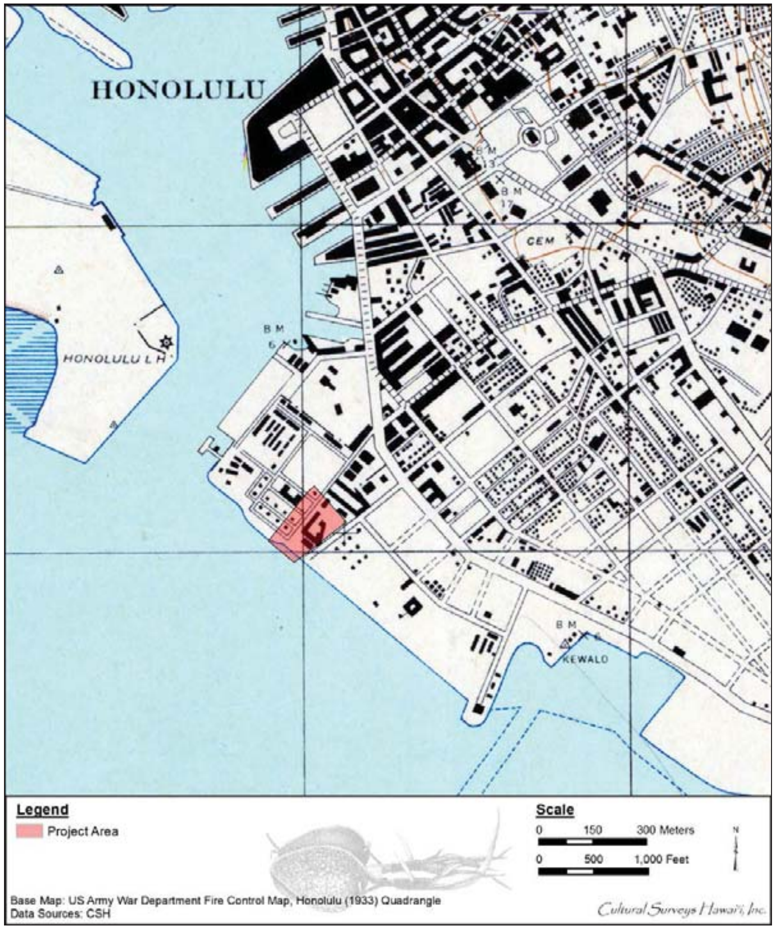

Figure 28. Portion of 1933 U.S. War Department Fire Control map, Honolulu quadrangle, showing study area

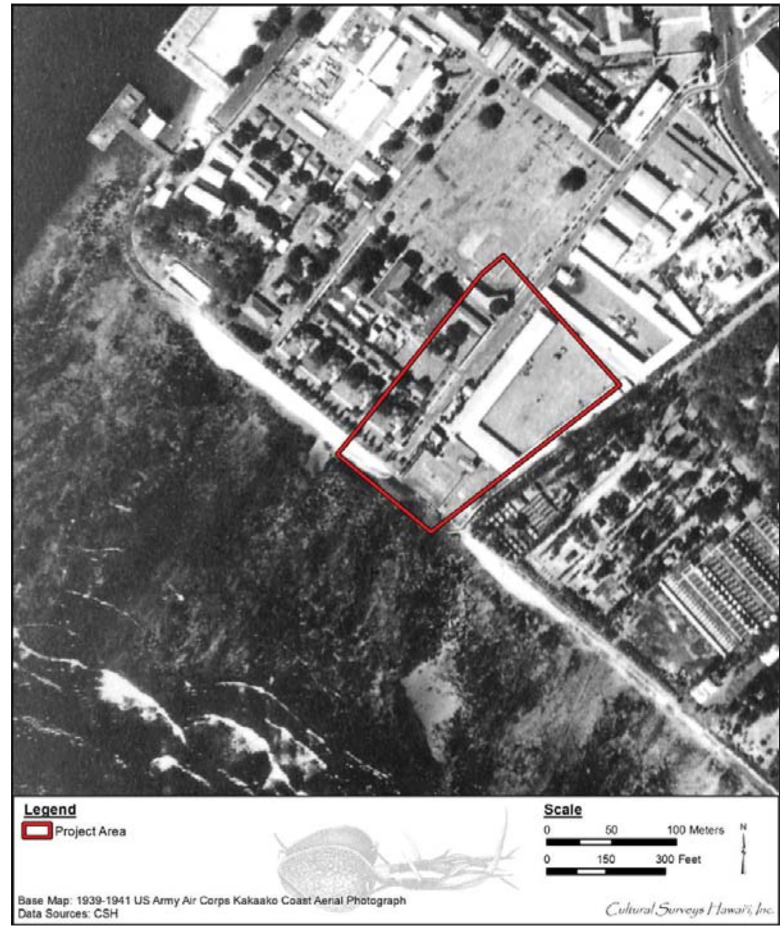

Figure 29. 1939-1941 U.S. Army Air Corps Kakaako Coast aerial photograph

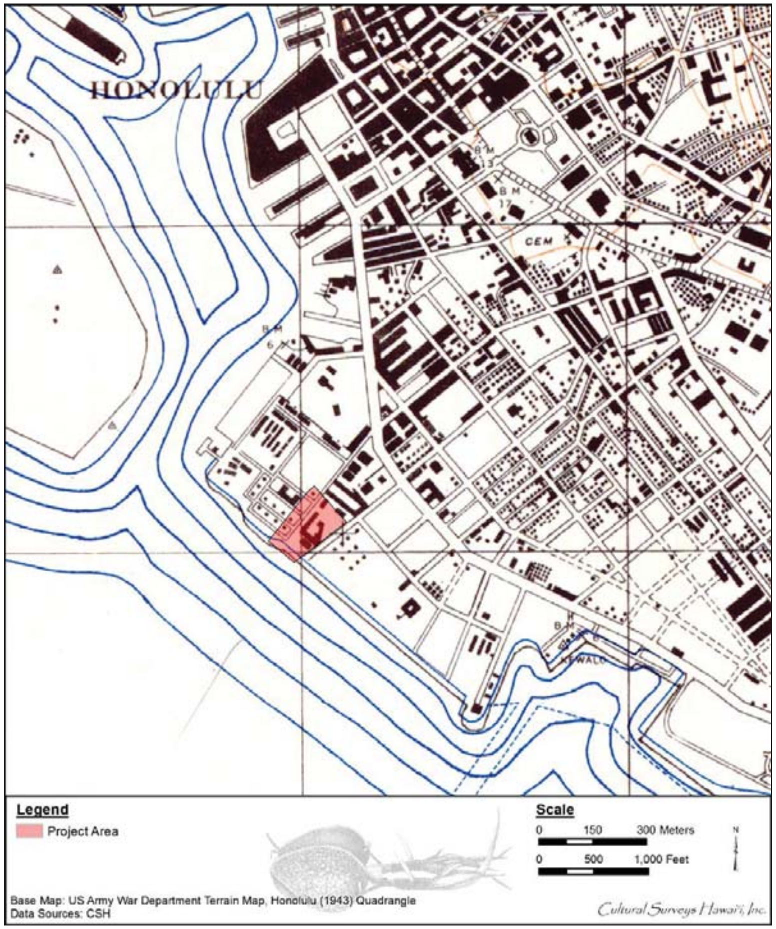

Figure 30. Portion of 1943 U.S. War Department terrain map, Honolulu quadrangle, showing study area

DAY AND NIGHT—A COLUMN OF SMOKE

"The desert waterfront of Honolulu where there is a perpetual volcano," described this forsaken stretch of scrub covered coral wasteland between what would become the Ala Wai and Kewalo Basin. In the center of this desolation stood a refuse dump where, day and night, columns of smoke rose into the Hawaiian sky.

Figure 31. 1921 photograph of a City worker supervising open burning of trash near Kewalo Basin (original photograph by Ray Jerome Baker, Kamehameha Schools Archives, reprinted in Scott 1968:578)

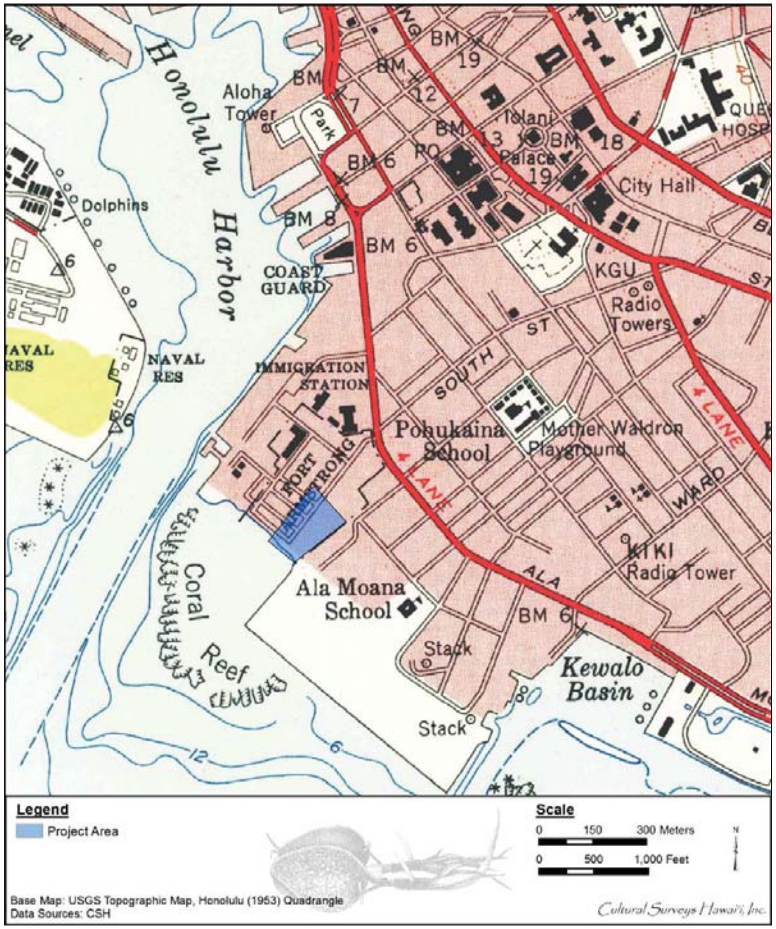

Figure 32. Portion of 1953 Honolulu USGS topographic quadrangle, showing project area

system had been reconfigured into approximately the present layout of Forrest Avenue (see Figure 37). It appears likely the small structures shown within this grid of Fort Armstrong streets to the west of the present project area in 1933 (see Figure 28) and 1943 (see Figure 30) continued until the 1960s but that the map conventions changed and such small buildings were no longer being depicted. The 1943 map (see Figure 30) also depicts four buildings in the east central portion of the present project area. A somewhat U-shaped building in the central portion of the campus in 1943 was quite large. All of these structures functioned as part of the Fort Armstrong infrastructure.

Prior to dredging, Kewalo Basin was a natural deep pocket in the reef seaward of Ala Moana Boulevard between Ward Avenue and Kamake‘e Street. The expansion of Kewalo Basin was part of the 1920s and early 1930s dredging operations that included the Ala Wai Canal, Ala Wai Basin, and Ala Moana Beach Park (see Figure 28 and Figure 30). After the dredging of the Ala Wai Canal, the Ala Wai and Kewalo Basins were dredged, along with a connecting channel. The dredged material was used for fill in and around the basins, and in the area that became Ala Moana Beach Park (Johnson 1991:364).

In the case of Kewalo Basin, most of the land between it and Fort Armstrong to the north-west had been previously filled (ca. 1900–1920). The area between Kewalo Basin and Fort Armstrong *makai* of Ala Moana became a part of Kaka‘ako called "Squattersville." "All Squattersville, like Gaul, is divided into three parts. There is the original settlement at Kewalo Basin Point, there is a tiny offshoot of this, and there is the later settlement along Ala Moana" (Johnson 1991:111). The later (ca. 1925–1930) dredging and filling created Ala Moana Beach Park and commercial dock space at the Ala Wai and Kewalo Basins.

The 1943 War Department map (see Figure 30) shows remarkably little urban development of the Kaka‘ako *makai* area in the preceding 10 years (compare with the 1933 map; see Figure 28) but we do see the completion of part of the east side of Kewalo Basin as a result of the creation of Ala Moana Park. Barely discernible on the west side of Kewalo Basin is the Honolulu City & County incinerator built in 1930 (and replaced in 1946; the surf break is still called "Incinerators"). It is understood that the products from incineration were generally used right there as land fill.

The 1953 USGS map (see Figure 32) and 1954 aerial photograph (Figure 33) show a very substantial expansion seaward that had occurred in the previous decade west of Kewalo Basin. This is understood as part of Honolulu City & County landfill that, while far more sanitary than the open burning of the 1920s, still may have been less than what we would call sanitary today. The surf break "Flies" off the west end of Kaka‘ako Waterfront Park is said to have been named by Joe Kuala in 1963 "for all of the flies at the landfill" (Clark 2002:74). Clark (2002:74) relates the surf site "was the home of many aggressive black flies that bit the surfers and fishermen."

The 1957 Hashimoto map (Figure 34) shows much of the same scene but the recent *makai* addition, immediately south of the present project area, is shown more clearly as still undeveloped.

The 1959 USGS map (Figure 35) clearly shows that the infilling behind the new (present day) seawall was actively on-going at statehood. The present land configuration on the southeast side of Kewalo Basin appears to have been completed in the 1956/1959 timeframe. The infilling of a

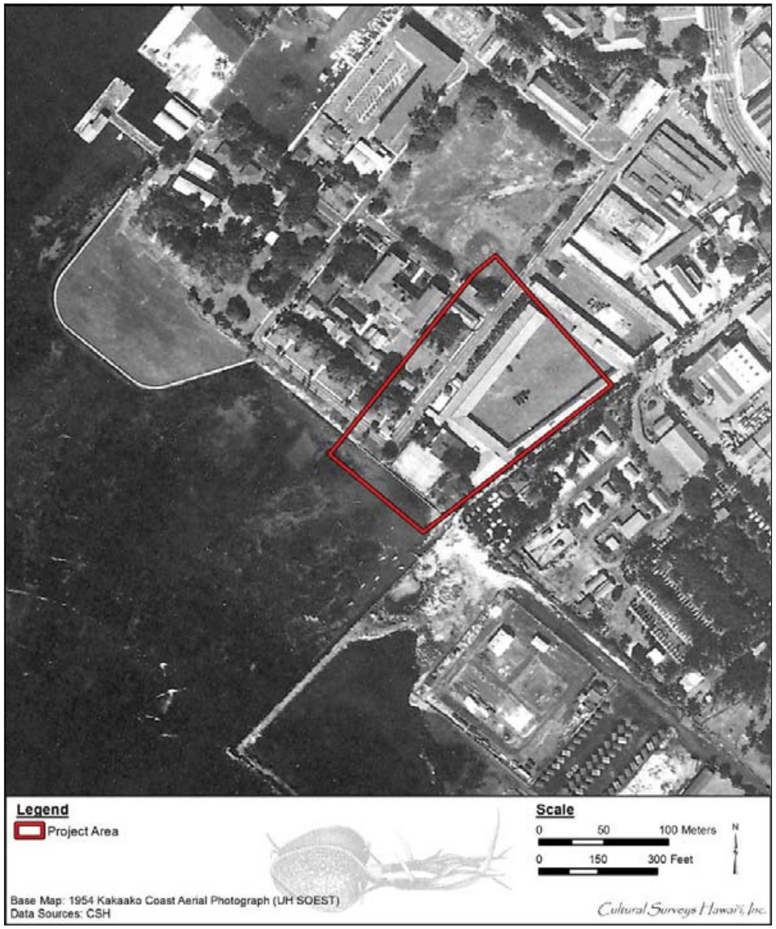

Figure 33. 1954 Kakaako Coast aerial photograph (UH SOEST) showing study area

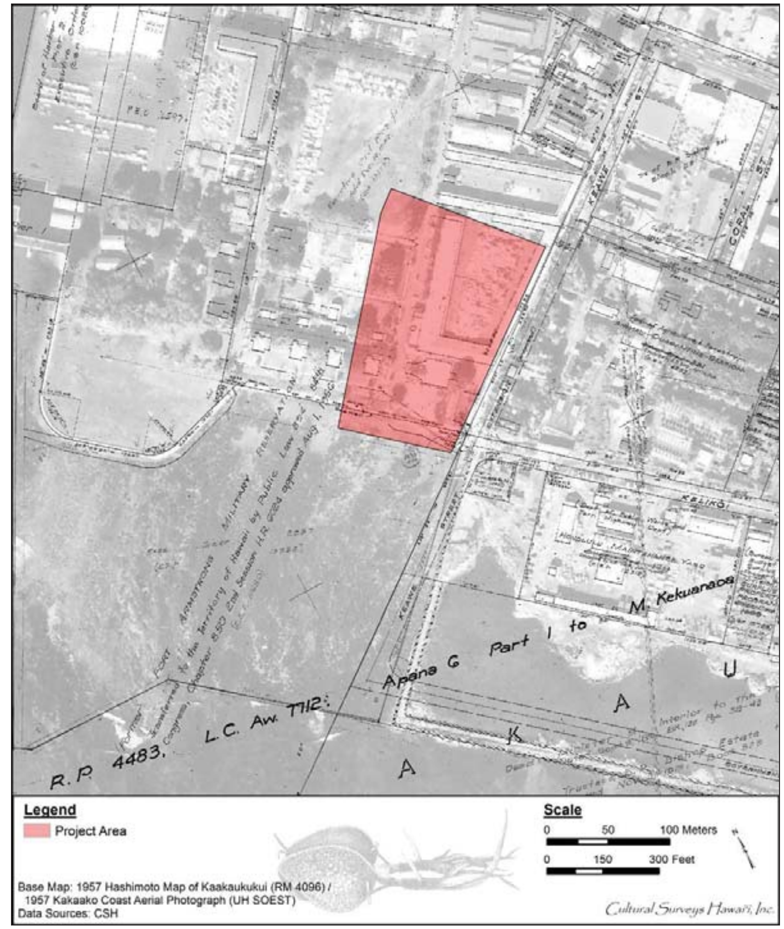

Figure 34. 1957 Hashimoto map of Kaakaukukui with a 1957 Kakaako coast aerial photograph (UH SOEST)

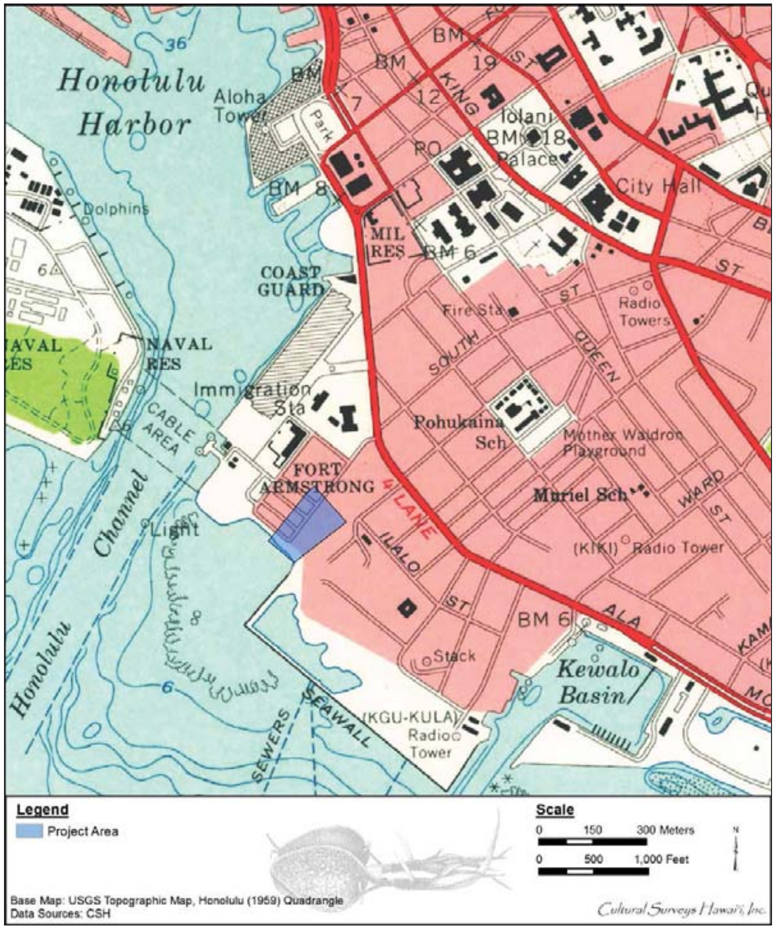

Figure 35. Portion of 1959 Honolulu USGS topographic quadrangle; note seaward portions of study area are still underwater

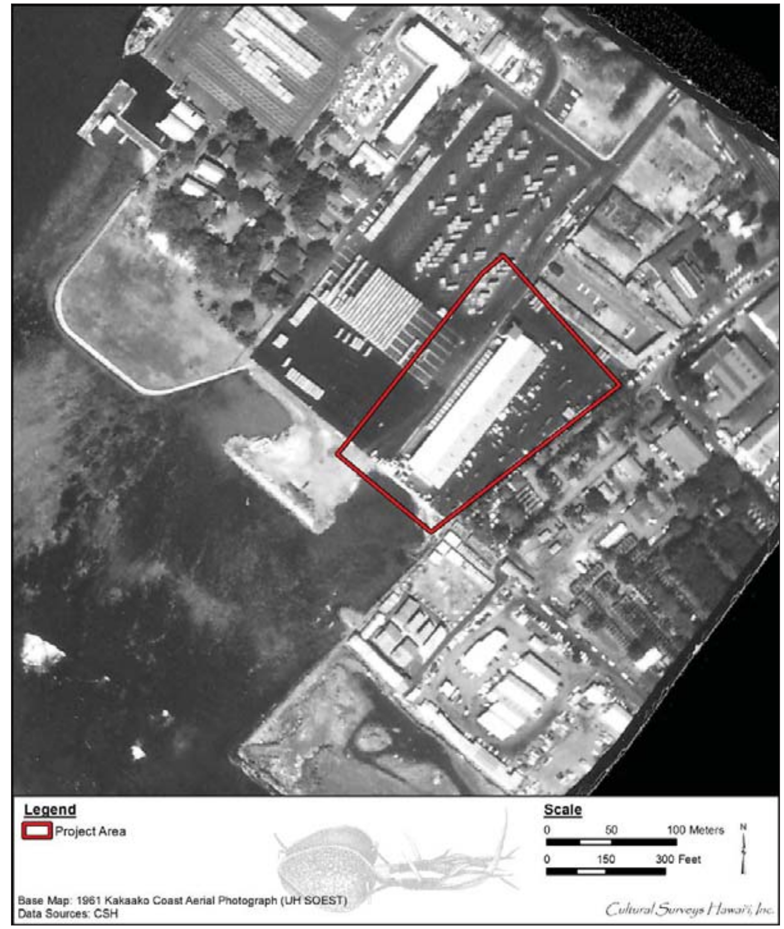

Figure 36. 1961 Kakaako Coast aerial photograph (UH SOEST)

portion of the dredge channel had formerly been continuous from the dredge channel fronting Ala Moana Beach Park to the dredged Kewalo Basin. As late as this 1959 map (see Figure 35), there is no indication of the landfill seaward of Fort Armstrong having been initiated. As late as 1961 (Figure 36), an aerial photograph shows the seaward edge of the present project as a seawall smack on the sea (in fact the seaward portion of Lot C is still ocean in 1961).

In the 1969 USGS map (Figure 37) we finally see the landfill configuration extant today with substantial fill activities having taken place on the seaward side of Fort Armstrong in the 1960s. This late landfill seaward of Fort Armstrong affected the surf:

> . . . there was another place to surf in Kaka‘ako that we called Armstrong’s. It was in front of Fort Armstrong. The shore there was different too—it was a shallow reef, and there were many military homes on the beach. We surfed in front of the homes. The landfill on the reef that made Piers 1 and 2 destroyed Armstrong’s. [as related by Rawlins “Sonny” Kauhane in Clark 2002:121]

Aerial photographs from 1974 and 1982 (Figure 38 and Figure 39) show a large rectangular warehouse still standing. However, by 2005 (Figure 40), this building has been removed and replaced by a large parking lot and a handful of small structures at the lot’s *makai* end.

In summary, in 1887 the Lot C project area was not only entirely ocean but was approximately 500 feet off shore (Figure 16). By 1897 a seawall bound enclosure was constructed adjacent to the north corner of Lot C but the entirety of Lot C appears to have been coral reef underwater at high tide (Figure 17). By 1891 the extreme east corner of Lot C may have been filled in and there was a powder magazine at the Ilalo St/Keawe corner (Figure 20). The powder magazine is still shown at this location twenty years later (Figure 24). By 1919 all but the most southwestern 20% of Lot C was filled in and appears tohave been incorporated within Fort Armstrong (Figure 26 and Figure 27). By 1933 (Figure 28) there was a large U-shaped building and other smaller buildings on Lot C that were probably part of Fort Armstrong. This building and road configuration including the large U-shaped building remained until 1957 (Figure 34). By 1961, however, the large U-shaped building had been replaced by a long rectangular warehouse with the long access SW/NE bisecting much of Lot C. This rectangular warehouse dominated the parcel through 1982 (Figure 39). By 2005 the rectangular warehouse was gone and most of Lot C was a parking lot as it remains today.

No in situ cultural deposits would be anticipated in the project area pre-dating 1890. Possibly remnants of a seawall foundation at the extreme north corner and remnants of a powder magazine foundation at the extreme east corner would date to the 1890s. The fill in the northeast third of Lot C is understood to date to the first decade of the twentieth century. Most of the project area was filled in in the 1910s. Foundations of small structures adjacent to Ilalo Road could be present. Foundations of several buildings and roads (understood as associated with Fort Armstrong) dating from the early 1930s on could be present.

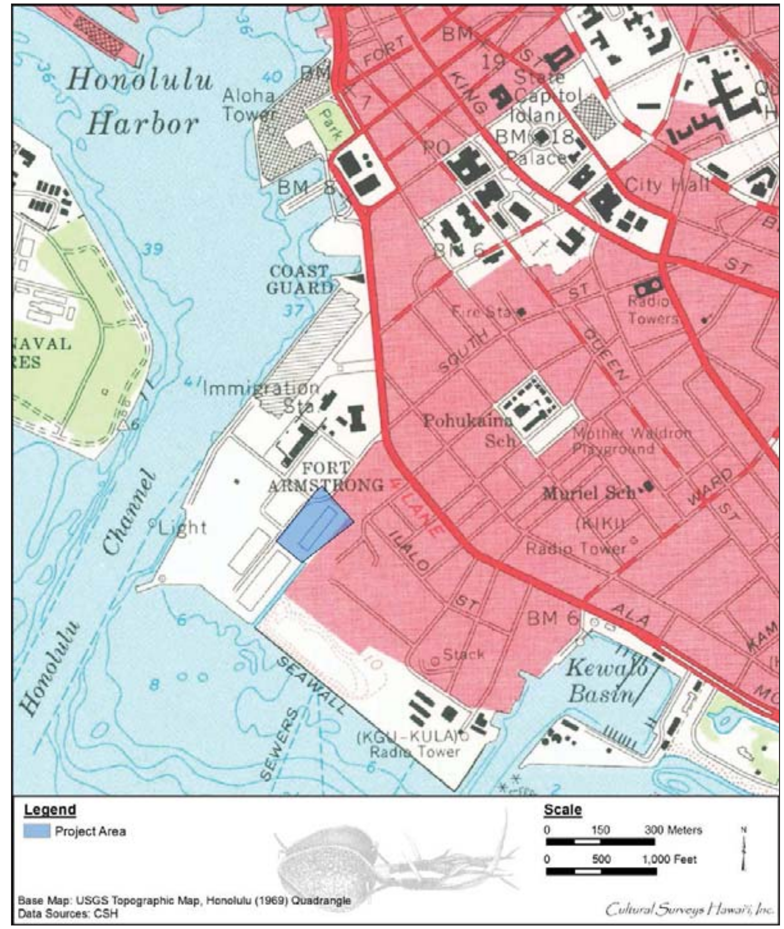

Figure 37. Portion of 1969 Honolulu USGS topographic quadrangle; note land fill within the study area was completed in the 1960s

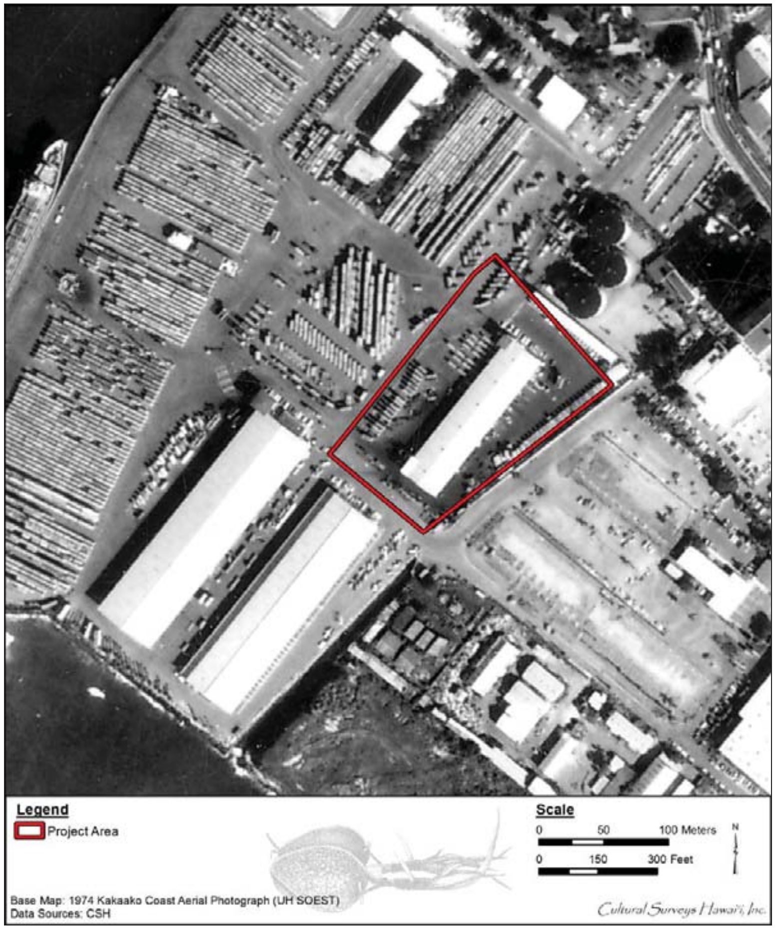

Figure 38. 1974 Kakaako Coast aerial photograph (UH SOEST)

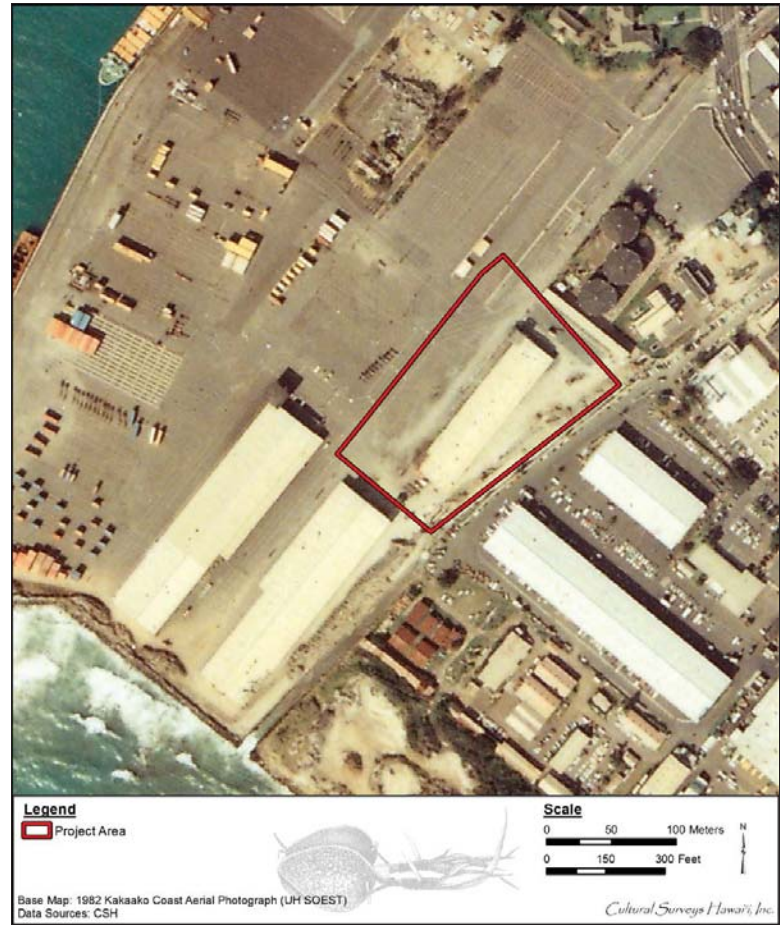

Figure 39. 1982 Kakaako Coast aerial photograph (UH SOEST)

Figure 40. 2005 Kakaako Coast aerial photograph (UH SOEST)

Section 3 Previous Archaeological Studies in the Vicinity

3.1 Previous Archaeological Studies

Figure 41 depicts previous archaeological studies in the vicinity. These studies are summarized in Table 1 and are discussed in greater detail in the following text. Previously identified historic properties in the vicinity are located in Figure 42 and are summarized in Table 2. While seaward portions of Kaka‘ako *mauka* of the Ala Moana/Nimitz alignment have yielded cultural properties and/or human skeletal remains, no projects *makai* of the Ala Moana/Nimitz alignment appear to have yielded subsurface cultural properties or human skeletal remains.

3.1.1 Yent 1985

Martha Yent (1985) of State Parks reported on burial excavations for the recovery of six burials at the former Honolulu Ironworks construction project area at the corner of Punchbowl and Pohukaina streets (TMK: [1] 2-1-029:001). Only a discussion of designated burials # 5 and # 6 are presented. Several other bones believed to be dog are mentioned. The antiquity of the burials is unclear. The disposition of the burials is not stated. These were later designated collectively as State Inventory of Historic Places (SIHP) # 50-80-14-2918.

3.1.2 Pfeffer et al. 1993

CSH (Pfeffer Borthwick and Hammatt 1993) produced an archaeological monitoring summary for a variety of improvement projects in Kaka‘ako Improvement District 1 (TMKs: [1] 2-1-029 through 2-1-032, 2-1-046 through 1-2-048, 2-1-051, 2-1-054, and 2-1-055) including the results of archaeological monitoring for the recovery of 31 burials from an 1853-1854 Honuakaha Smallpox Cemetery (SIHP # -3712) at Quinn Lane, one historic burial from Punchbowl Street (SIHP # -4532), one possibly pre-Contact burial from Halekauwila Street (SIHP # -4533), and 116 historic burials from Kawaiaha‘o Cemetery (SIHP # -4534) at Queen Street (used from 1825–1920). The closest finds to the present project area were the single burial from Halekauwila Street (SIHP # -4533) 41.2 m (135 ft) ‘Ewa of South Street and the finds along South Street near Quinn Lane.

3.1.3 McIntosh and Cleghorn 2000

Pacific Legacy (McIntosh and Cleghorn 2000) prepared an *Archaeological Report for the Oahu Commercial Harbors 2020 Master Plan-Immediate Phase Environmental Impact Statement* addressing five discrete areas in southeast Honolulu Harbor including western Fort Armstrong (Pier 2 at TMKs: [1] 2-1-015:029 and 030). An overview of cultural history and previous archaeology is presented but the primary focus in the closest (Pier 2) project area was mitigation for the demolition of the Pier 2 shed (built in 1953).

3.1.4 Borthwick and Hammatt 2001

CSH (Borthwick and Hammatt 2001) wrote an archaeological monitoring report for Kaka‘ako Improvement District 6 (TMKs: [1] 2-1-056, 058, 059, 060) an irregularly shaped approximately 7.7-acre project area bounded by Ala Moana Boulevard on the north, ‘Āhui Street on the west,

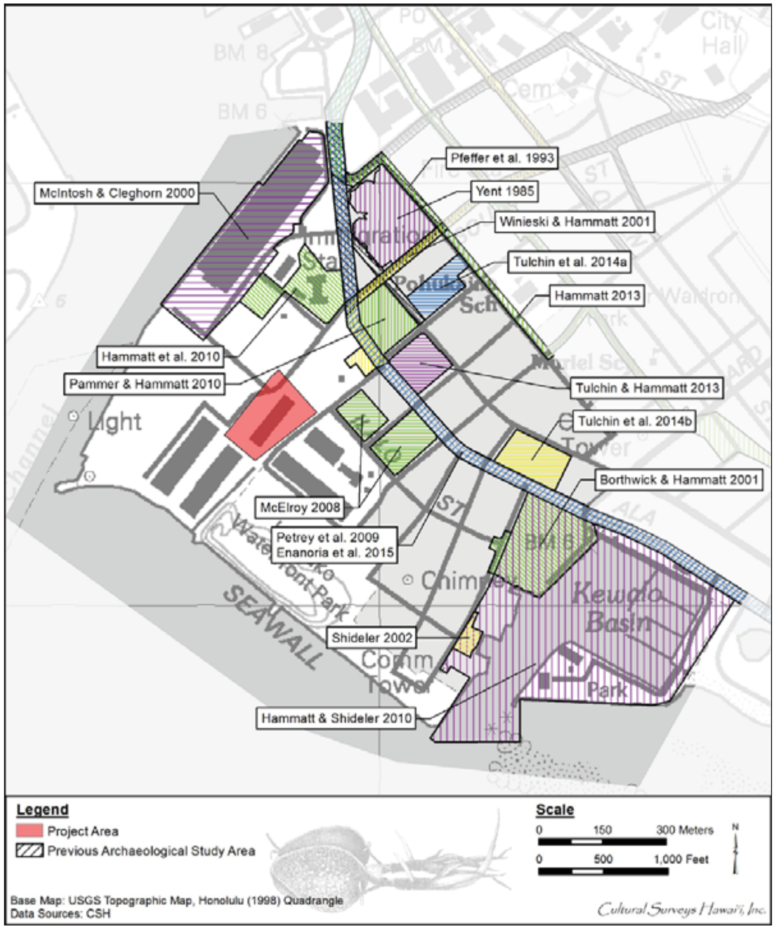

Figure 41. Previous archaeological studies in the vicinity

Table 1. Previous Archaeological Studies in the Vicinity

Author	Nature of Study	General Location	Description and Results (SIHP # 50-80-14)
Yent 1985	Burial excavations	Honolulu Ironworks construction site	Ka‘ākaukukui Cemetery (SIHP # -2918) at the Honolulu Ironworks project area; six burials (SIHP # -2918) mentioned
Pfeffer et al. 1993	Archaeological monitoring summary	Kaka‘ako Improvement District 1, TMKs: [1] 2-1-029 through 032, 046 through 048, 051, 054, and 055	Monitoring for Kaka‘ako ID-1; 31 burials from 1853-1854 Honuakaha Smallpox Cemetery (SIHP # -3712) at Quinn Lane, one historic burial from Punchbowl St (SIHP # -4532), one possibly pre-Contact burial from Halekauwila St (SIHP # -4533), and 116 historic burials from Kawaiaha‘o Cemetery (SIHP # -4534) at Queen St (used from 1825–1920)
McIntosh and Cleghorn 2000	Archaeological study for Oahu Commercial Harbors 2020 Master Plan-Immediate Phase EIS	Five discrete areas in SE Honolulu Harbor including western Fort Armstrong (Pier 2), TMKs: [1] 2-1-015:029 and 030	Overview of cultural history and previous archaeology; discusses mitigation for demolition of Pier 2 shed (built in 1953)
Borthwick and Hammatt 2001	Archaeological monitoring	Kaka‘ako Improvement District 6, TMKs: [1] 2-1-056, 058, 059, and 060	Based on background data and monitoring results, specific project area was seaward of shoreline and was cut and filled in early to mid-1900s
Winieski and Hammatt 2001	Archaeological monitoring	Nimitz Hwy reconstructed sewer, TMKs: [1] 1-7-002, 003 and 2-1-002, 013–016, 025, 027, and 029–032	Identified historic brick alignment at intersection of Queen St; historic brick-lined manhole and remnant of light gauge trolley rail (SIHP # -5942) observed at intersection of Queen St and Nimitz Hwy; no other cultural features or materials encountered within project area
Shideler 2002	HABS documentation	121 ‘Āhui St	Incinerator Number One (Old Kewalo Incinerator) built in 1930; concluded Incinerator Number One achieves state and local significance in areas of maritime and social history, as well as engineering and architecture

Author	Nature of Study	General Location	Description and Results (SIHP # 50-80-14)
McElroy 2008	Archaeological assessment	3.10-acre property bounded by Coral St, Ilalo St, Cooke St, and Ala Moana Blvd, TMKs: [1] 2-10-059:011 and 012	Test excavations showed study area consisted of former reef flats filled in during early 1900s
Petry et al. 2009	Archaeological monitoring	Nimitz Hwy and Ala Moana Blvd resurfacing project, TMKs: [1] 2-1-014 and 027	No historic properties or burials encountered; project excavations, however, generally to depths of 0.6 m or less below existing surface
Hammatt et al. 2010	Archaeological literature review and field inspection	U.S. Immigration and Customs Enforcement (ICE) Master Plan, TMKs: [1] 2-1-015:018 and 020	Concluded study area is twentieth century fill atop tidal flats (except for late nineteenth century seawall potentially abutting northeast edge of project lands)
Hammatt and Shideler 2010	Archaeological literature review and field inspection	Kewalo Basin Repairs project, TMK: [1] 2-1-058	At least 95% of study area is twentieth century fill; potential cultural deposit bearing soils within 10 m seaward of seaward curb of Ala Moana Blvd
Pammer and Hammatt 2010	Archaeological assessment	Former Comp USA Parcel, Kaka‘ako	No historic properties identified within the 4.7-acre project area; project area underwent extensive land modification by filling of low lying areas of Kaka‘ako
Hammatt 2013	Archaeological inventory survey	City Center (Section 4) of the Honolulu High-Capacity Transit Corridor project	Identified three archaeological historic properties near present project area: • SIHP # -2918, a subsurface cultural deposit and human burials • SIHP # -7189, a subsurface burnt trash deposit • SIHP # -7190, subsurface salt pan remnants

Author	Nature of Study	General Location	Description and Results (SIHP # 50-80-14)
Tulchin and Hammatt 2013	Archaeological inventory survey	Kamehameha Schools Kaka‘ako Block F, TMKs: [1] 2-1-055:003, 006, 021, 026, and 038	Two archaeological historic properties identified: • SIHP # -7412, post-Contact cultural layer associated with construction and utilization of Kaka‘ako Leper Detention Depot • SIHP # -7413, post-Contact trash layers and structural remnants associated with construction and utilization of Hawaiian Sugar Planters Association Immigration Station
Tulchin et al. 2014a	Archaeological inventory survey	Kamehameha Schools Kaka‘ako Block B, TMKs: [1] 2-1-054:025, 027, 028 (por.) and 032	Two archaeological historic properties identified: • SIHP # -7512, post-Contact structural remnants associated with early to mid-twentieth century development • SIHP # -7513, post-Contact trash layer associated with early twentieth century land reclamation
Tulchin et al. 2014b	Archaeological inventory survey	Kamehameha Schools Kaka‘ako Block I, TMKs: [1] 2-1-056:002, 007, and 008)	Six archaeological historic properties identified: • SIHP # -7578, twentieth century cultural layer • SIHP # -7579, twentieth century fill deposit and building foundations • SIHP # -7580, pre-Contact to post-Contact cultural layer with a historic burial cluster • SIHP # -7581, a pre-Contact traditional Hawaiian bundle burial • SIHP # -7582, disarticulated human skeletal remains within a non-burial context • SIHP # -7583, disarticulated human skeletal remains within a non-burial context

Author	Nature of Study	General Location	Description and Results (SIHP # 50-80-14)
Enanoria et al. 2015	Archaeological monitoring	Ala Moana Blvd/ Nimitz Hwy resurfacing and highway lighting replacement project, TMKs: [1] 2-1-014, 027, 2-3, and 2-6	Three archaeological cultural resources identified: • SIHP # -4573, subsurface remnants of pond sediment (Loko Kaipuni) • SIHP # -7435 Features A–D, human skeletal remains • SIHP # -7436, human skeletal remains

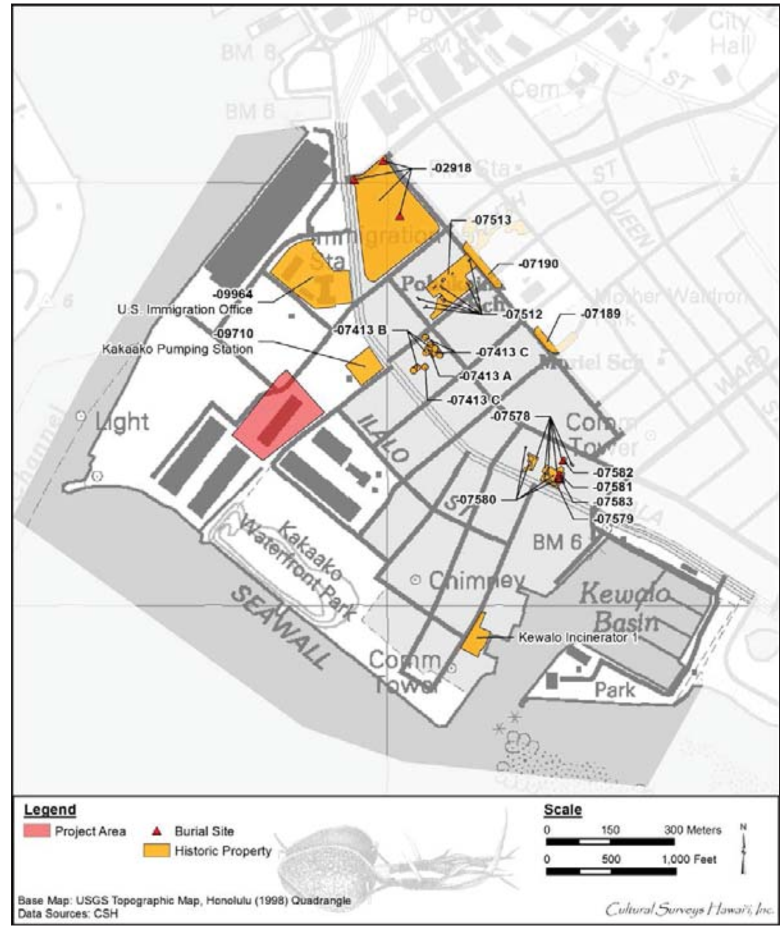

Figure 42. Previously identified historic properties in the vicinity

Table 2. Previously Identified Historic Properties near the Present Project Area

SIHP #	Site Type	Age	Source
50-80-14-02918	Subsurface cultural deposit	Both	Hammatt 2013
50-80-14-02918	Burials	Uncertain	Yent 1985, Hammatt 2013
50-80-14-07189	Historic burnt garbage deposits	Post-Contact	Pammer et al. 2011, Hammatt 2013
50-80-14-07190	Salt pan remnants	Both	Pammer et al. 2011, Hammatt 2013
50-80-14-07413 A	Historic building	Post-Contact	Tulchin and Hammatt 2013
50-80-14-07413 B	Subsurface building foundation	Post-Contact	Tulchin and Hammatt 2013
50-80-14-07413 C	Subsurface trash layer	Post-Contact	Tulchin and Hammatt 2013
50-80-14-07512	Historic building remnants	Post-Contact	Tulchin et al. 2014a
50-80-14-07513	Subsurface trash deposit	Post-Contact	Tulchin et al. 2014a
50-80-14-07578	Subsurface cultural deposit	Post-Contact	Tulchin et al. 2014b
50-80-14-07579	Subsurface infrastructure remnants	Post-Contact	Tulchin et al. 2014b
50-80-14-07580	Subsurface cultural deposit	Both	Tulchin et al. 2014b
50-80-14-07580	Burials	Uncertain	Tulchin et al. 2014b
50-80-14-07581	Burials	Uncertain	Tulchin et al. 2014b
50-80-14-07582	Burials	Uncertain	Tulchin et al. 2014b
50-80-14-07583	Burials	Uncertain	Tulchin et al. 2014b
50-80-14-09710	Kakaako Pumping Station	Post-Contact	NRHP
50-80-14-09964	U.S. Immigration Office	Post-Contact	NRHP
No SIHP #	Kewalo Incinerator 1	Post-Contact	Shideler 2002

Kewalo Basin on the east, and extending approximately 200 ft seaward of Halo Street on the south. During monitoring work, the types of material observed included varieties of fill and natural tidal flats material. The fill material ranged from crushed coral to marine clays related to the pumped sludge-like dredged material. The pumped dredged material generally made up the lower course of fill, with the drier crushed coral fill on top. Concrete pads or asphalt made up the uppermost or surface layer throughout most of the project area. No burials, traditional Hawaiian or early historic cultural layers, or large historic to modern trash pits were observed during any monitoring phase. The finds were, as anticipated, fill materials over tidal flats strata.

3.1.5 Winieski and Hammatt 2001

CSH (Winieski and Hammatt 2001) reported on archaeological monitoring for a Nimitz Highway reconstructed sewer project. No traditional Hawaiian cultural materials or features were observed. No pre-Contact or historic burials were encountered. A historic period soda bottle was encountered in an historic fill layer at the intersection of Pohukaina and South streets. A historic brick alignment was observed at the intersection of Queen Street. A historic brick-lined manhole and a remnant of light gauge trolley rail (SIHP # -5942) were observed at the intersection of Queen Street and Nimitz Highway. Historic rubbish was found scattered through a fill layer at the intersection of Maunakea Street and Nimitz Highway. No other cultural features or materials were encountered within the project area.

3.1.6 Shideler 2002

CSH (Shideler 2002), working with Mason Architects Inc. and David Franzen (photographer), produced Historic American Buildings Survey (HABS) documentation of Incinerator Number One (Old Kewalo Incinerator) at 121 ‘Āhui Street built in 1930. The study notes Incinerator Number One was one of two facilities constructed by the City and County of Honolulu to dispose of waste from the nearby Ala Moana dump. The ash from the incinerator facilities was used to fill the seawall constructed over the shallow reef at Ka‘äkaukukui in the late 1940s. By 1956, 29 acres of new land were added to the shoreline, dramatically altering Honolulu's coastal landscape. It was concluded that Incinerator Number One achieves state and local significance in the areas of maritime and social history, as well as engineering and architecture under Criteria A and C.

3.1.7 McElroy 2008

Garcia and Associates (McElroy 2008) conducted an archaeological assessment of a 3.10-acre property bounded by Coral Street, Ilalo Street, Cooke Street, and Ala Moana Boulevard (TMKs: [1] 2-10-059:011 and 012) in Kaka‘ako. Four test pits were excavated on the *mauka* ends of the two parcels documenting modern historic fill deposited directly on former shallow reef. Stratigraphy at all test pit locations confirmed there are no buried terrestrial deposits on the parcels.

3.1.8 Petry et al. 2009

CSH (Petry et al. 2009) prepared an archaeological monitoring report for a Nimitz Highway and Ala Moana Boulevard resurfacing project (TMKs: [1] 2-1-014 and 027). While no historic properties or burials were encountered in the project excavations, this may have been due to the fact that project excavations were generally to depths of 0.6 m or less below the existing surface.

3.1.9 Hammatt, et al. 2010

CSH (Hammatt et al. 2010) prepared an archaeological literature review and field inspection study for a U.S. Immigration and Customs Enforcement (ICE) Master Plan (TMKs: [1] 2-1-015:018 and 020). It appeared the study area is twentieth century fill atop tidal flats, excepting a late nineteenth century seawall potentially abutting the northeast edge of the project lands. The study noted that bomb shelters (manifest on the surface by rectilinear mounds) were excavated into the eastern lawn of the Immigration Station during World War II.

3.1.10 Hammatt and Shideler 2010

CSH (Hammatt and Shideler 2010) prepared an archaeological literature review and field inspection report for a Kewalo Basin repairs project (TMK: [1] 2-1-058.) The study concluded at least 95% of the study area is twentieth century fill. Some question remained whether there may be potentially cultural-deposit-bearing soils within 10 m seaward of the seaward curb of Ala Moana Boulevard.

3.1.11 Pammer and Hammatt 2010

CSH (Pammer and Hammatt 2010) conducted an archaeological assessment for the approximately 4.7-acre former Comp USA parcel (TMKs: [1] 2-1-055:004, 009, and 017) bound by Auahi Street to the north, Keawe Street to the east, Ala Moana Boulevard to the south, and South Street to the west. Five test excavations were undertaken. Trenches 2–5 contained only fill material down to the coral shelf. Trench 1 contained a thin sand layer, but no cultural materials were found within the sand.

3.1.12 Hammatt 2013

CSH (Hammatt 2013) conducted an archaeological inventory survey for the City Center (Section 4) of the Honolulu High-Capacity Transit Corridor project. The project area included Dillingham Boulevard, Ka‘aahi Street, Nimitz Highway, Ala Moana Boulevard, Halekauwila Street, Queen Street, and Kona Street. While 19 archaeological cultural resources were identified within, or immediately adjacent to, the City Center AIS study area, only three of these were close to the present study area:

- SIHP # -2918 is a previously identified subsurface cultural deposit and 30 features located along Punchbowl Street near the Ala Moana intersection, and *makai* of Pohukaina Street between Punchbowl and South streets. This archaeological cultural resource was first identified in 1985 by Martha Yent of State Parks as consisting of at least five burial pits located at the Honolulu Ironworks construction site (Yent 1985).
- SIHP # -7189 is a subsurface burnt trash deposit previously identified (Pammer et al. 2011) within the block bounded by Halekauwila, Keawe, Pohukaina, and South Streets.

- SIHP # -7190 consisting of previously identified (Pammer et al. 2011) subsurface salt pan remnants (including possible berms) located southwest (*makai*) of Halekauwila Street, between South and Keawe streets.

3.1.13 Tulchin and Hammatt 2013

CSH (Tulchin and Hammatt 2013) conducted an archaeological inventory survey for the Kamehameha Schools Kaka‘ako Block F, the block bounded by Ala Moana Boulevard, Keawe Street, Auahi Street, and Coral Street (TMKs: [1] 2-1-055:003, 006, 021, 026, and 038). Two archaeological historic properties were identified:

- SIHP # -7412, post-Contact cultural layer associated with the construction and utilization of the Kaka‘ako Leper Detention Depot, and
- SIHP # -7413, post-Contact trash layers and structural remnants associated with the construction and utilization of the Hawaiian Sugar Planters Association Immigration Station.

Additionally, Mason Architects Inc. conducted an architectural inventory survey for "Kaka‘ako Mauka" that includes the project area (Mason Architects 2009). Seven buildings were described. Three buildings were evaluated as eligible or potentially eligible for National Register of Historic Places (NRHP) listing. These include the following:

- 331 Keawe Street (TMK: [1] 2-1-055:038), constructed 1914,
- 660 Ala Moana (TMK: [1] 2-1-055:003), constructed 1962, and
- 680 Ala Moana (TMK: [1] 2-1-055:021), constructed 1960.

3.1.14 Tulchin et al. 2014a

CSH (Tulchin et al. 2014a) conducted an archaeological inventory survey for the 2.5-acre Kamehameha Schools Kaka‘ako Block B bounded by Pohukaina, Keawe, Auahi, and South streets (TMKs: [1] 2-1-054:025, 027, 028 (por.), and 032). Thirty-nine test excavations were excavated, documented, and sampled. Two archaeological historic properties were identified,

- SIHP # -7512, post-Contact structural remnants associated with early to mid-twentieth century development, and
- SIHP # -7513, post-Contact trash layer associated with early twentieth century land reclamation.

3.1.15 Tulchin et al. 2014b

CSH (Tulchin et al. 2014b) conducted an archaeological inventory survey for the 3.4-acre Kamehameha Schools Kaka‘ako Block I, within the block bounded by Auahi Street, Ward Avenue, Ala Moana Boulevard, and Koula Street (TMKs: [1] 2-1-056:002, 007, and 008). Six archaeological historic properties were identified as follows:

- SIHP # -7578, twentieth century cultural layer,
- SIHP # -7579, a twentieth century fill deposit and building foundations,
- SIHP # -7580, pre-Contact to post-Contact cultural layer with a historic burial cluster,

- SIHP # -7581, a pre-Contact traditional Hawaiian bundle burial,
- SIHP # -7582, disarticulated human skeletal remains within a non-burial context, and
- SIHP # -7583, disarticulated human skeletal remains within a non-burial context.

3.1.16 Enanoria et al. 2015

CSH (Enanoria et al. 2015) reported on archaeological monitoring for an Ala Moana Boulevard/ Nimitz Highway resurfacing and highway lighting replacement project, between Fort Street and Kalākaua Avenue (TMKs: [1] 2-1-014, 027, 2-3, and 2-6). Three archaeological cultural resources were identified as follows:

- SIHP # -4573, subsurface remnants of pond sediment (Loko Kaipuni),
- SIHP # -7435 Features A–D, human skeletal remains, and
- SIHP # -7436, human skeletal remains.

Section 4 Results of Field Inspection

A brief field inspection (approximately one hour) was carried out by David Shideler, M.A. on 12 May 2015 under the overall supervision of Hallett H. Hammatt Ph.D., principal investigator. The project area was accessed from the east corner at the intersection of Ilalo and Keawe streets. The Ala Moana Wastewater Pump Station (Division of Wastewater Management, Department of Public Works, City and County of Honolulu) was noted just *mauka* of the northeast corner of the project area on the *mauka* side of Ilalo Street. A large warehouse facility immediately *makai* of the project area is presently used by Reuse Hawaii. The following series of photographs moves clockwise around the perimeter of the project area from the east corner (Figure 43 and Figure 44), to the south corner (Figure 45), to the west corner (Figure 46), and to the north corner (Figure 47). Representative photographs of the central interior are then presented with a view to the southwest toward the *makai* Reuse Hawaii warehouse and facility (Figure 48), a view to the southeast toward the University of Hawai‘i John A. Burns School of Medicine (Figure 49), and a view *mauka* or northeast (Figure 50).

At present, virtually the entire project area is an asphalt parking lot with a scatter utility poles bound by a chain link fence. A couple of small patches of concrete were observed. There is some landscaping with monkey pod trees (*Samanea saman*) and hibiscus (*Hibiscus* sp.) on the Ilalo Street side. Otherwise there are only a few exotic weedy species present (such as finger grass *Chloris virgata*, etc.). It appeared that the vast majority of the parcel is presently visitor and permit parking for the Burns School of Medicine campus. The southwest portion of the parcel is fenced-off for potential parking and/or storage.

The only unusual landform in the vicinity is a culvert to the sea extending southwest from the east corner of the Lot C project area (Figure 51). This open culvert to the sea (Figure 52) becomes a box culvert as it extends northeast along the northwest side of Keawe Street along the southeast side of the project area. This drainage way may have been developed in the early to mid-1920s when there was a substantial phase of land filling to the southeast of the present project area.

Figure 43. General view of east corner (Ilalo Street/Keawe Street intersection) of Lot C, view to west-southwest

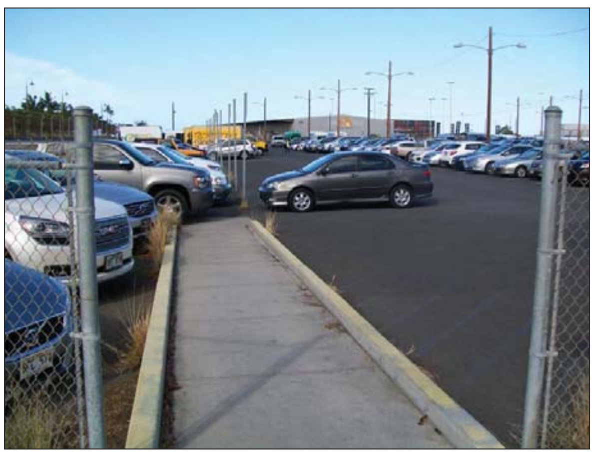

Figure 44. General view of southeast side of Lot C project area from near Ilalo Street, view to southwest

Figure 45. General view of south corner of the Lot C project area, view to north

Figure 46. General view of west corner of the Lot C project area (John A. Burns School of Medicine in background), view to east

Figure 47. General view of north corner of the Lot C project area, view to south

Figure 48. General view of central portion of the Lot C project area, view to southwest

Figure 49. General view of central portion of the Lot C project area, view to southeast

Figure 50. General view of central portion of the Lot C project area, view to northeast

Figure 51. Grate at east corner of Lot C project area at Ilalo and Keawe streets (at left); view to southwest

Figure 52. Channel to the sea just south of south corner of the lot C project area, view to southwest

Section 5 Evaluation of the Archaeological Potential of the HTDC at Lot “C” Project Area

The previous overview documents in some detail the rather slow history of land reclamation at the Lot C project area. Up through 1887 (see the Wall map; Figure 16) the project area is entirely ocean shallows. The 1891 Dodge map (see Figure 20) appears to show dry land at the extreme east corner (near the intersection of Ilalo and Keawe streets) where there is a powder magazine. The 1897 Monsarrat map (see Figure 17) shows that a new seawall may abut the north corner of the project area. By 1911, the Podmore map (see Figure 24) indicates the northeast third of the project area is dry land and the powder magazine is still shown at the east corner. By 1919 (see Figure 26) and 1920 (see Figure 27), the *mauka* four-fifths of the project area has been filled in. By 1933 (see Figure 28), a large U-shaped building dominates the project area that is still shown as late as 1957 (see Figure 34). This has been replaced by 1961 (see Figure 36) by a long southwest/northeast trending warehouse structure. The southwest end of the project area is still ocean as late as 1961 (see Figure 37).

It is possible that a remnant of the powder magazine foundation (ca. 1891 through 1911) still lies near the intersection of Ilalo and Keawe streets and the east corner of the Lot C project area. It is possible a remnant of a bounding sea wall (constructed ca. 1897) lies near the north corner of the project area. No older historic properties would be expected. There could potentially be early twentieth century in situ deposits (such as trash pits or building foundations) relating to the early history of Fort Armstrong.

In the past, the SHPD has typically not required archaeological study of such relatively recent fill lands. We do, however, recommend consultation with the SHPD in advance of any proposed development at the Lot C project area to avoid any possible delays through timely compliance.

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APPENDIX B:

Phase I Environmental Site Assessment,
EnviroServices & Training Center, August 2015.

PHASE I
ENVIRONMENTAL SITE ASSESSMENT

Innovation Block at Lot C Master Plan
Ilalo Street and Keawe Street
Honolulu, Oahu, Hawaii 96815
TMK (1) 2-1-015: Parcel 052

Prepared For:
Hawaii Community Development Authority
547 Queen Street
Honolulu, Hawaii 96813

Prepared By:
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ETC Project No. 15-1006

July 2015

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APPENDICES

1.0 EXECUTIVE SUMMARY

This report presents the results of a Phase I Environmental Site Assessment (ESA) performed by EnviroServices & Training Center, LLC (ETC) in conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Practice E1527-13. ETC was contracted by Ferraro Choi (Client) to complete this Phase I ESA for the Hawaii Community Development Authority (User) for the Innovation Block at Lot C Master Plan project site located at Ilalo Street and Keawe Street, Honolulu, Hawaii, herein referred to as the Subject Property. The Subject Property is identified as Tax Map Key (TMK) identification number (1) 2-1-015: Parcel 052 and is currently owned by Hawaii Community Development Authority (HCDA).

The Subject Property consists of approximately 5.5 acres of improved land located at Ilalo Street and Keawe Street in Honolulu, Hawaii, which is on the south central portion of the island of Oahu (Appendix I, Figure 1). The Subject Property is currently used as a parking for the adjacent University of Hawaii.

Visual observation for the use and/or storage of hazardous materials and hazardous waste was performed on May 29, 2015. Other than petroleum staining typically associated with parking areas, there were no indications of petroleum impacts or hazardous materials on the Subject Property. Additionally, there were no indications of underground storage tanks (USTs), aboveground storage tanks (ASTs), or their associated piping. Five HECO-owned pole-mounted transformers were observed on the Subject Property. Two of the transformers were fair to poor condition with evidence of corrosion; however, no indications of a release from these transformers was observed. In a letter, dated June 1, 2015, HECO confirmed that the transformers are considered 'Non PCB'. Based on these findings, the observed transformed are not considered a REC for the Subject Property. Stockpiles of apparent sweeping debris were observed along the eastern boundary of the Subject Property. These stockpiles were not considered to be a significant concern for the Subject Property.

The Subject Property was not listed by the contracted database search. The contracted database search identified one (1) Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) No Further Remedial Action Planned (NFRAP) site, one (1) Federal CERCLIS site, one (1) Resource Conservation Recovery Act (RCRA) Corrective Action Sites (CORRACTS) site, two (2) RCRA sites, forty-one (41) State-Equivalent CERCLIS and National Priorities List (NPL) sites, thirty-two (32) Leaking Underground Storage Tanks (LUST) sites, three (3) UST sites, one (1) Brownfields site, and thirteen (13) Orphan sites within specified radii. Based on these findings, ETC requested and reviewed select facility files from the Hawaii Department of Health (DOH) Solid and Hazardous Waste Branch (SHWB) and DOH Hazard Evaluation and Emergency Response (HEER) Office. ETC reviewed several files associated with the area-wide site known as the *Kakaako Brownfields (i.e. Unit 6, Unit 7, Unit 8, Historic Ala Moana Pump Station, and Makai Parcel).* Except for the Historic Ala Moana Pump Station and the Makai Parcel 1, the *Kakaako Brownfields* site generally includes multiple sites bound by Ohe Stree, Ilalo Street and the Kewalo Basin. Review of the *Kakaako Pump Station (aka the Historic Ala Moana Pumping Station)* facility file indicated that the site is located north of Ilalo Street, which is topographically upgradient

and adjacent to the northern boundary of the Subject Property. Document review indicated that detectable concentrations of petroleum constituents and metals in soil and groundwater were identified within the active Ala Moana WWPS site and the northwest portion of the Historic Ala Moana Pumping Station property. The petroleum and metal contaminants were suspected to be associated with the historic land filling operations in the Kakaako area. In addition to those identified by the contracted database, additional Brownfields sites were included in the *Kakaako Brownfields* file (i.e. Unit 2, Unit 4, etc.). Investigative reports indicate that petroleum and heavy metal contaminants are present in the soil and/or groundwater throughout *Kakaako Brownfields*. In addition review indicated that the impacts were suspected to be associated with the historic usage of the area and the former *Kewalo Incineratory/Ash Dump* site. Based on these findings, ETC cannot dismiss the possibility that residual contaminants associated with the historic use and suspect fill operations may be present on the Subject Property. As such, this finding is considered a REC.

ETC reviewed several Client provided environmental reports pertaining to the former Produce Center & Department of Agriculture (DOA) Facility located at 651 Ilalo Street. Note that the 651 Ilalo Street site is located adjacent to the eastern boundary of the Subject Property and is the current JABSOM/UHCC site. Historical information indicates that the former Foreign Trade Zone CEM Warehouse was formerly located on the Subject Property. Document review indicated that contaminant migration from the Foreign Trade Zone-managed property (Subject Property) and the former Kewalo Incinerator Landfill were considered a 'area of concern' for the 651 Ilalo Street property (JABSOM/UHCC). Document review also indicated that a separate Phase I ESA was completed for the Foreign Trade Zone property, which includes the Subject Property. Note that ETC was not provided this document; however, review indicated that several potential environmental concerns within the Foreign Trade Zone property were identified including 'former USTs that were removed without proper soil sampling, visual observations of oil-stained ground surface, subsurface contamination originating from improper material storage, and potential USTs'. The Foreign Trade Zone area was also historically part of Fort Armstrong and used as a military reservation. The western boundary of the 651 Ilalo Street site was analyzed for potential petroleum contaminant migration from the Subject Property. Analytical results along the western boundary of the site indicated that detectable concentrations of total petroleum hydrocarbons (TPH) as Diesel (D), TPH as Oil (O), and toluene were noted in the subsurface soils. While no analytical data was found for the Subject Property, based on ETC's review findings coupled with the historical use of the Subject Property, ETC cannot dismiss the possibility that residual contaminants associated with the historical use (i.e. former UST, storage practices, etc.) of the Subject Proeprty. As such, this finding is considered a REC.

In summary, ETC performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E1527-13 on the Subject Property. This assessment has revealed no evidence of RECs in connection with the Subject Property except:

- Potential presence of contaminants associated with the historical usage, operations (i.e former UST, storage practices, etc.), and suspect fill operations on the Subject Property.

2.0 INTRODUCTION

EnviroServices & Training Center, LLC (ETC) was contracted by Ferraro Choi (Client) to complete a Phase I Environmental Site Assessment (ESA) for the Hawaii Community Development Authority (HCDA) (User) for the Innovation Block at Lot C Master Plan project site located at Ilalo Street and Keawe Street, Honolulu, Hawaii, herein referred to as the Subject Property. The Subject Property is identified as Tax Map Key (TMK) identification number (1) 2-1-015: Parcel 052.

This Phase I ESA was performed in accordance with the ASTM International Standard E1527-13 entitled *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (referred to herein as the ASTM Practice). The ASTM Practice is intended for use by parties who wish to assess the environmental condition of commercial real estate with respect to contaminants within the scope of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and petroleum products. As such, the ASTM Practice was designed to satisfy "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined in 42 United States Code (U.S.C.) §9601(35)(B).

2.1 Background

Under CERCLA, persons may be held liable for cleaning up hazardous substances at properties that they either currently own or operate, or owned or operated at the time of disposal. Strict liability in the context of CERCLA means that a potentially responsible party may be liable for environmental contamination based solely on property ownership and without regard to fault or negligence.

In 1986, the Superfund Amendments and Reauthorization Act (SARA) amended CERCLA by creating an "innocent landowner" defense to CERCLA liability for those persons who could successfully demonstrate, among other requirements, that they "did not know and had no reason to know" prior to purchasing the property that any hazardous substance that is the subject of a release or threatened release was disposed of on, in, or at the property. Such persons, to demonstrate that they had "no reason to know" must have undertaken, prior to, or on the date of acquisition of the property, "all appropriate inquiries" into the previous ownership and uses of the property consistent with good commercial or customary standards and practices.

The Small Business Liability Relief and Brownfields Revitalization Act (referred to as "the Brownfields Amendments") was enacted in January 2002 to amend CERCLA. These amendments included providing funds to assess and clean up brownfields sites, clarifying CERCLA liability provisions for certain landowners, and providing funding to enhance state and tribal cleanup programs.

Subtitle B, Title II of the Brownfields Amendments revised CERCLA, clarifying the requirements necessary to establish the innocent landowner defense. The Brownfields Amendments also added protections from CERCLA liability for "bona fide prospective purchasers" and "contiguous property owners" who meet certain statutory requirements. Each of the CERCLA liability provisions for innocent landowners, bona fide prospective purchasers, and contiguous property owners (referred to collectively as "landowner liability protections," or LLPs) requires that, among other requirements, persons claiming the liability protections conduct all appropriate inquiries into prior ownership and use of a property prior to or on the date a person acquires a property.

A key provision of the Brownfields Amendments was to finalize regulations setting federal standards for the conduct of all appropriate inquiries. Such federal standards were promulgated in the *Standards and Practices for All Appropriate Inquiries, Final Rule*, *40 CFR Part 312*, referred to as the AAI Final Rule.

Section 312.11 of the AAI Final Rule indicates that the ASTM International Standard E1527-13, entitled *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, may be used to comply with the requirements set forth in Sections 312.23 through 312.31 of the AAI Final Rule. Therefore, this Phase I ESA was performed in conformance with the ASTM International Standard E1527-13.

2.2 Purpose

The purpose and goal of this Phase I ESA is to conduct an inquiry designed to identify recognized environmental conditions in connection with the Subject Property, to the extent feasible pursuant to the process described in the ASTM Practice. The term recognized environmental condition (REC) is defined as:

> "The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative or a release to the environment; (3) under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not recognized environmental conditions."

As defined in the ASTM Practice, for the purposes of this Phase I ESA, the term "migrate" or "migration" refers to the movement of hazardous substances or petroleum products in any form, including, for example, solid and liquid at the surface or subsurface, and vapor in the subsurface (ASTM, 2013).

2.3 Scope of Services

The scope of work included the following:

- Development of a site description for the Subject Property including site background, physical characteristics and historical site conditions;
- Evaluation of user provided information including but not limited to environmental liens, activity and use limitations, specialized knowledge, valuation reduction of environmental issues, and other information pertaining to the property;
- Evaluation of information in programs such as NPL, CERCLIS, FINDS, ERNS, RCRA notifiers, and other governmental information systems within specific radii of the property to identify sites that would have the potential to impact the property;
- Visual evaluation of current site conditions (as applicable) including compliance with appropriate regulations as they pertain to the presence of facility storage tanks, drums, and containers; and transformers and other electrical equipment potentially containing PCBs;
- Visual evaluation of the adjacent properties to identify high-risk neighbors and the potential for a chemical to migrate onto the property;
- Interviews with owner(s), site manager(s), occupant(s), local government official(s), and/or other individuals with past and prior use history of the property;
- Complete a written report detailing the Phase I ESA findings, conclusions; and
- Documentation of supportive information including maps, site photographs, regulator records, and interview(s).

2.4 Significant Assumptions

This Phase I ESA is limited by the availability of information at the time of the assessment. Interviews were conducted and interviewee's responses were assumed to be answered in good faith, to the extent of his/her actual knowledge. In addition, since no hydrogeological data was available for the Subject Property, the groundwater was assumed to flow in the direction of the surface topography of the Subject Property and surrounding areas.

2.5 Conditions and Limitations

ETC has completed this Phase I ESA for the Subject Property in accordance with the scope and limitations of ASTM Practice E1527-13. ETC's findings and conclusions contained herein are professional opinions based solely upon visual observations, interviews, and interpretation of the historical information and documents available to ETC at the time this Phase I ESA was conducted. Opinions stated in this report do not apply to changes that may have occurred after the services were performed.

ETC has performed specified services for this project with the degree of care, skill and diligence ordinarily exercised by professional consultants performing the same or similar services. No other warranty, guarantee, or representation, expressed or implied, is included or intended; unless otherwise specifically agreed to in writing by both ETC and ETC's Client.

2.6 User Reliance

This report is intended for the sole use of ETC's Client, exclusively for the project site indicated. ETC's Client may use and release this report, including making and retaining copies, provided such use is limited to the particular site and project for which this report is provided. However, the services performed may not be appropriate for satisfying the needs of other users. Release of this report to third-parties will be at the sole risk of Client and/or said user, and ETC shall not be liable for any claims or damages resulting from or connected with such release or any third party's use or reuse of this report.

3.0 SITE DESCRIPTION

3.1 Location and Description

The Subject Property consists of approximately 240,059 square feet (5.511 acres) of improved land located at Ilalo Street and Keawe Street in Honolu, Hawaii, which is on the southeastern portion of the island of Oahu. The Subject Property is identified by TMK (1) 2-1-015: Parcel 052. The Subject Property currently includes a parking lot. Maps of the Subject Property are included in Appendix I and photographic documentation is included in Appendix II.

3.2 Physical Setting

Groundcover at the Subject Property generally consists of concrete and asphalt with limited areas of landscaped vegetation along Ilalo Street. The Subject Property and surrounding areas appeared relatively flat, with no discernible gradient.

3.2.1 Site Topography

Topographic map coverage of the Subject Property and surrounding areas is provided by the United States Geological Survey Island of Oahu, Hawaii 7.5-minute Series, Honolulu Quadrangle, 1998. The elevation of the Subject Property is approximately 6 feet above mean sea level (msl).

3.2.2 Regional Geology

Oahu is formed by the erosional remnants of two shield volcanoes. These are the Waianae range to the west and the Koolau range to the east. The Waianae volcano is estimated to have formed 2.4 to 3.6 million years before present. It consists of a tholeiitic lava shield with a thick cap of transitional to alkalic rock. Rejuvenation-stage volcanics of undifferentiated age occur in Kolekole Pass and on the south flank of the Waianae shield. Dike orientations define northwest and southwest rift zones (Macdonald, et al., 1983).

The Koolau volcano is estimated to have formed 1.8 to 2.6 million years before the present (Macdonald, et al., 1983). It consists of a tholeiitic lava shield and lacks an alkalic cap. It has well defined major dike complex trending northwest-southwest. A third, minor rift zone referred to as the Kaau rift trends southward from Kaau crater, near the upland crest of the Koolau Ridge. After a long dormant period and periods of deep erosion, the Koolau volcano developed abundant and scattered rejuvenation-stage vents, typically aligned on northeast-striking fissures (Macdonald, et al., 1983).

3.2.3 Site Geology

The soil at the Subject Property is mapped as Fill land, mixed (Fl). Fl consists of areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources. This land type is typically used for urban development including airports, housing areas, and industrial facilities (USDA, 1972).

3.2.4 Regional Hydrogeology

The primary drinking water in the Hawaiian Islands is drawn from basal groundwater. Basal groundwater is formed by rainwater percolating down through the residual soils and permeable volcanic rock. The portion of the island situated below sea level is saturated with ocean salt water, except within rift zones of the volcanoes where fresh water forms a basal lens called the "Ghyben-Herzberg" lens. A zone of transition between the fresh groundwater and the ocean salt water occurs due to the constant movement of the interface as a result of tidal fluctuations, seasonal fluctuations in recharge and discharge and aquifer development (Macdonald, et al., 1983).

Downward percolation of rainwater may be stopped by impermeable layers such as dense lava flows, alluvial clay layers and volcanic ash, which can cause the formation of a perched or high level aquifer that is not in contact with salt water. Recharge of the aquifer occurs in areas of high rainfall, which are the interior mountainous areas. The groundwater flows from the recharge areas to the areas of discharge along the shoreline. Frictional resistance to groundwater flow causes it to pile up within the island until it attains sufficient hydraulic head to overcome friction. Thus, basal groundwater tends to slope toward the shoreline.

3.2.5 Site Hydrogeology

The Subject Property is underlain by the Nuuanu Aquifer System, which is part of the Honolulu Aquifer Sector on the island of Oahu. The aquifer is classified by Mink and Lau, 1990, with the system identification number 30102116 (13321). This system includes an unconfined basal aquifer in sedimentary (nonvolcanic) lithology. The groundwater in this aquifer is described as being currently in use and containing groundwater with a moderate salinity (1,000 to 5,000 mg/l Cl^-). The groundwater is neither a drinking water source nor ecologically important, and is also described as replaceable with a high vulnerability to contamination (Mink and Lau, 1990).

The site is further underlain by a second aquifer of the same system. The aquifer is a confined, basal aquifer in flank compartments, and is classified with the system identification number 30102121 (11113). The aquifer is described as a currently used drinking water source containing groundwater with a fresh salinity (<250 mg/l Cl^-). It is also described as irreplaceable with a low vulnerability to contamination (Mink and Lau, 1990).

3.2.6 Nearest Surface Water Bodies

The nearest surface water body is the Honolulu Harbor (Honolulu Channel) located approximately 0.18 miles west of the Subject Property.

3.3 Current Use of the Subject Property

The northern portion of the Subject Property is currently used as a parking lot. The southern portion of the Subject Property is currently a vacant paved lot.

3.4 Current Uses of the Adjoining Properties

ETC visually inspected the neighboring properties and their operations from the Subject Property and publicly accessible areas. East of the Subject Property is Keawe Street, beyond which is the John A. Burns School of Medicine at the University of Hawaii at Manoa (JABSOM) and the University of Hawaii Cancer Center (UHCC). The secured access to cargo shipping area on Pier 1 is located to the west of the Subject Property. South of the Subject Property is a large warehouse that includes Re-Use Hawaii, the Next Step Shelter, and The Friends of the Library of Hawaii. The Subject Property is bordered to the north by Ilalo Street, beyond which is a current construction project.

4.0 USER PROVIDED INFORMATION

This section is intended to provide information obtained from the user of this Phase I ESA that will help identify RECs associated with the Subject Property. The information provided does not require the user to have the technical expertise of an environmental professional and are generally not provided by the environmental professional performing the Phase I ESA.

4.1 Required Information

In order to qualify for one of the LLPs offered by the Brownfields Amendments, the user must provide the following information (if available) to the environmental professional. Failure to provide this information could result in a determination that “all appropriate inquiry” is not complete. Mr. Carson Schultz, Planner, HDCA (“user”), provided ETC with the following information.

4.1.1 Environmental Liens

The user has no knowledge of any environmental liens or governmental notifications relating to past or recurrent violations of environmental laws with respect to the Subject Property.

4.1.2 Activity and Use Limitations

The user indicated that entitlements for development and use are governed by the HCDA’s Makai Area Rules (HAR §15-23). There are no other activity and land use limitations filed or recorded in a registry under federal, tribal, state or local law.

4.1.3 Specialized Knowledge

The user had no specialized knowledge or experience related to the Subject Property.

4.1.4 Valuation Reduction for Environmental Issues

The user indicated that the Subject Property is not changing ownership and therefore, there is no purchase price.

4.1.5 Commonly Known or Reasonably Ascertainable Information

The user was not aware of any commonly known or reasonably ascertainable information about the Subject Property that would help the environmental professional to identify conditions indicative of releases or threatened releases.

4.1.6 Degree of Obviousness of Potential Contamination

The user has no knowledge of any obvious indicators that point to the presence or likely presence of contamination at the property based on their knowledge and experience related to the Subject Property.

4.2 Other Information Pertaining to the Subject Property

4.2.1 Reason for Performing Phase I ESA

This Phase I ESA was conducted as the required due diligence for a master plan to develop new buildings on the Subject Property.

4.2.2 Title Records

Preliminary title records/documents were not provided by the User; however, ETC conducted a limited land title search, which is documented in Section 5.3.3.

4.2.3 Owner, Property Manager, and Occupant Information

Subject Occupant: JABSOM and UHCC (Parking)

Subject Manager: Edward Los Banos, HCDA Asset Manager, (808) 594-0343

Subject Property Owner:HCDA

4.3 User Provided Documents

The following documents were reviewed at HCDA's offices. The reviewed reports pertained to the former Produce Center & Department of Agriculture (DOA) Facility located at 651 Ilalo Street. Note that this site is located adjacent to the eastern boundary of the Subject Property and is the current JABSOM/UHCC site. Historical information indicates that the former Foreign Trade Zone CEM Warehouse was formerly located on the Subject Property.

4.3.1 May 2001 Phase I ESA – Former Produce Center & DOA Facility

Review of the May 8, 2001 Phase I ESA prepared by Kimura International, Inc. (KI) indicated that several "areas of concern" were identified. Specifically, the site was noted to be an 'open' LUST site indicating that UST release response activities had not yet been completed. In addition, contaminant migration from the Foreign Trade Zone-managed property and the former Kewalo Incinerator Landfill was also considered a 'area of concern'. Based on ETC's historical review, the Foreign Trade Zone-managed property included the Subject Property. ETC's review indicated that a separate Phase I ESA was completed for the Foreign Trade Zone property, which also included the Subject Property. Document review indicated that several potential environmental concerns within the Foreign Trade Zone property were identified including 'former USTs that were removed without proper soil sampling, visual observations of oil-stained ground surface, subsurface contamination originating from improper material storage, and potential USTs'. In addition, the Foreign Trade Zone area was historically part of Fort Armstrong and used as a military reservation.

4.3.2 January 2002 Limited Phase II ESA – 651 Ilalo Street

Review of the January 16, 2002 Limited Phase II ESA prepared by KI indicated that the investigation generally focused on areas identified in KI's May 2001 Phase I ESA. Upon further research and investigation, KI deemed the former USTs, two transformers, and concrete vault as not a concern. However, soil and groundwater sampling was conducted along the site's southern and western boundaries. Note that the Subject Property is the west adjacent property.

Soil and groundwater along the southern boundary of the site was investigated to address environmental concerns associated with the former Kewalo Incenerator Landfill. Investigation results indicated that detectable concentrations of dioxins, heavy metals, polynuclear aromatic hydrocarbons (PAHs), and PCBs were detected in the soil. In addition, elevated concentrations of dissolved lead were detected in the groundwater.

The western boundary of the site was analyzed for potential petroleum contamination from the from the Subject Property and remaining areas of the former Foreign Trade Zone managed property. Two of the soil samples had detectable concentrations of total petroleum hydrocarbons as diesel and/or oil, benzene/toluene/ethylbenzene/xylenes (BTEX), and PAHs; however, there were no detectable concentrations of BTEX and PAHs in the groundwater. KI recommended further investigation to delineate the contaminants in these two areas as well as to investigate additional areas of potential contamination based on historical use.

4.3.3 March 2002 Additional Phase II ESA – Produce Center

Review of the March 26, 2002 Phase II ESA conducted by KI indicated that the investigation focused the incinerator landfill on the southern portion of the site as well as identified areas of potential historical contamination within the site boundaries. Historical operations included animal quarantine station, vector control, vehicle servicing, and a carpentry shop. Sample analysis indicated detectable concentrations of organochlorine pesticides, heavy metals (i.e. arsenic, lead), PAHs, and PCBs were detected in the soil and/or groundwater at the site. KI's recommendations included capping the southern boundary, delineation and soil removal activities.

4.3.4 August 2002 Comprehensive Summary of Phase II ESA Sampling Data - Produce Center

Review of the August 26, 2002 Comprehensive Summary of Phase II ESA Sampling Data report prepared by KI indicated that additional environmental investigation was performed in select areas of the site prior to construction of the current JABSOM/UHCC facility. Specifically, additional soil and groundwater samples were collected analyzed for suspected contaminants (i.e. organochlorine pesticides, PAHs, heavy metals, etc.). Analytical results along the western boundary of the site indicated that detectable concentrations of TPH-D, TPH-O, and toluene were noted in the subsurface soils. No detectable concentrations of TPH were found in the groundwater in this area. Note that detectable concentrations of the organochlorine pesticides, heavy metals, and petroleum related constituents were noted in other areas of the site. KI's final recommendations were that a cap be placed over the landfill impacted areas on the southern boundary and an Exposure Management Plan be developed to protect construction workers during the development of the site as a University with the building itself acting as a cap for the remaining contaminants on the site.

5.0 RECORDS REVIEW

5.1 Standard Environmental Record Sources

To obtain information concerning recognized environmental conditions at or near the Subject Property, ETC contracted Environmental Data Resources, Inc. (EDR) to conduct an environmental database search. EDR is a company that specializes in the review of public regulatory environmental databases. The regulatory agency report provided (Appendix IV) is based on an evaluation of the data collected and compiled by a contracted data research company. The report is a radius search report, which focuses on both the Subject Property and adjacent properties that may impact the Subject Property. Adjacent properties listed in governmental environmental records are identified within a specific search radius (Table 2). The search radius varies depending on the particular record being researched. The search is designed to meet the requirements of the current industry approach as described in ASTM Practice E1527-13. The information provided is assumed to be correct and complete, unless noted otherwise.

Table 2: ASTM Practice Environmental Record Sources and Recommended Search Distances

Environmental Database Sources	ASTM Practice Search Distances (miles)
Federal NPL Site List	1.0
Federal Delisted NPL Sites	0.5
Federal CERCLIS List	0.5
Federal CERCLIS NFRAP Site List	0.5
Federal RCRA CORRACTS Facilities List	1.0
Federal RCRA non-CORRACTS TSD Facilities List	0.5
Federal RCRA Generators List	Subject Property and adjoining properties
Federal Institutional Control/Engineering Control Registries	Subject Property only
Federal ERNS List	Subject Property only
State-Equivalent NPL	1.0
State-Equivalent CERCLIS	0.5
State Landfill and/or Solid Waste Disposal Site Lists	0.5
State Leaking LUST List	0.5
State Registered UST List	Subject Property and adjoining properties
State Institutional Control Registry	Subject Property only
State Voluntary Cleanup/Response (VCP/VRP) Sites	0.5
State Brownfield Sites	0.5

5.1.1 Federal NPL and Delisted NPL

The National Priorities List (NPL) is the Environmental Protection Agency's (EPA) database of uncontrolled or abandoned hazardous waste properties, which are considered to pose an immediate threat to human health and the environment. These properties are identified for priority remedial response actions under the Superfund Program. The Subject Property was not identified as a NPL site or a delisted NPL site. The database did not identify any delisted NPL sites within a 0.5-mile radius of the Subject Property. The database did not identify any NPL sites within a 1-mile radius of the Subject Property.

5.1.2 Federal CERCLIS and CERCLIS NFRAP

The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database contains information on various aspects of potentially uncontrolled or abandoned hazardous waste properties from initial screening and assessment phases to listing on the NPL. The Subject Property was not identified as an active CERCLIS site or a CERCLIS No Further Remedial Action Planned (NFRAP) site. The database identified one (1) active CERCLIS NFRAP facility and one (1) CERCLIS facility within a 0.5-mile radius of the Subject Property.

5.1.3 Federal RCRA CORRACTS

The RCRA Corrective Action Sites (CORRACTS) database contains Resource Conservation Recovery Information System (RCRIS) sites with reported corrective action. The Subject Property was not identified as a CORRACTS facility. The database search identified one (1) CORRACTS site within a 1-mile radius of the Subject Property.

5.1.4 Federal RCRA (non-CORRACTS) TSD Facilities

The EPA's RCRA program identifies and tracks hazardous waste from the point of generation to the point of final disposal. The RCRA Treatment, Storage or Disposal (TSD) facility database compiles those reporting facilities that treat, store, or dispose of hazardous waste. The Subject Property was not identified as a RCRA TSD facility. The database search did not identify any RCRA TSD facilities within a 0.5-mile radius of the Subject Property.

5.1.5 Federal RCRA Generator

The RCRA Generator database is a compilation by EPA's RCRIS of regulated facilities that generate hazardous waste. The Subject Property was not identified as a RCRA Large Quantity Generator (LQG) or RCRA Small Quantity Generator (SQG) facility. The database search did not identify two (2) RCRA Generator sites on a potential adjoining property with respect to the Subject Property.

5.1.6 Federal Institutional Control/Engineering Control Registries

Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health. Institutional Controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on a site. The EPA Institutional Control and Engineering Control registry maintains a listing of sites with Institutional or Engineering Controls in place. The Subject Property was not identified as having institutional or engineering controls in place.

5.1.7 Federal ERNS

The Emergency Response Notification System (ERNS) tracks the initial notification of reported oil and hazardous material spills. The database contains information regarding the discharger, release date, material, amount released, incident location and release action taken. The Subject Property was not identified as an ERNS facility.

5.1.8 State Equivalent NPL and CERCLIS

The CERCLIS List is a compilation of known or suspected uncontrolled or abandoned hazardous waste sites. These sites either have been investigated or are currently under investigation by the EPA for the release, or threatened release, of hazardous substances. Once a site is placed in CERCLIS, it may be subjected to several levels of review and evaluation and ultimately placed on the National Priorities List. The State of Hawaii does not have a formal "State Superfund" program; therefore, the State Hazardous Waste Sites (SHWS) are the State of Hawaii's equivalent to the federal EPA's CERCLIS database. Additionally, because this information is acquired from the Hawaii Department of Health (DOH) Hazard Evaluation and Emergency Response (HEER) Office, these sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup that use state funds (state equivalent superfund) are identified along with sites where cleanup is paid for by the potentially responsible parties. The Subject Property was not identified as a SHWS facility. The database search identified forty-one (41) SHWS facilities within a 1-mile radius of the Subject Property.

5.1.9 State Landfill and/or Solid Waste Disposal

The State of Hawaii has records of all facilities that have received a solid waste management permit, including solid waste landfills, transfer stations, and incinerators. The Subject Property was not identified as a Solid Waste Facility/Landfill (SWF/LF) facility. The database search did not identify any SWF/LF facilities within a 0.5-mile radius of the Subject Property.

5.1.10 State Leaking Underground Storage Tanks

The DOH Underground Storage Tank (UST) Program maintains a listing of all reported leaks and releases from USTs. The Subject Property was not identified as a leaking underground storage tank (LUST) facility. The database search identified thirty-two (32) LUST facilities within a 0.5-mile radius of the Subject Property.

5.1.11 State Registered Underground Storage Tanks

The DOH Underground Storage Tank (UST) Program registration system tracks known and registered UST systems. The Subject Property was not identified as a UST facility. The database search identified three (3) UST facilities located on potential adjoining property with respect to the Subject Property.

5.1.12 State Institutional Control Registry

Institutional Controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on a site. The State Institutional Control listing includes Voluntary Response Program and Brownfields sites with institutional controls in place. The Subject Property was not identified as having institutional controls in place.

5.1.13 State Voluntary Cleanup/Response Sites

The Hawai‘i Voluntary Response Program (VRP) was created on July 7, 1997 by amendments made to Hawaii's Environmental Response Law (ERL). The purpose of the VRP is to streamline the cleanup process in a way that will encourage prospective developers, lenders, and purchasers to voluntarily cleanup properties. The VRP facilitates the cleanup process and, in certain situations, provides relief from the strict liability provisions of the Federal CERCLA and Hawai‘i ERL. The Subject Property was not identified as a VRP site. The database search did not identify any VRP sites located within a 0.5-mile radius of the Subject Property.

5.1.14 State Brownfields

A Brownfields site is land which the expansion, redevelopment, or reuse of may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant. The Subject Property was not identified as a Brownfields site. The database search identified one (1) Brownfields site within a 0.5-mile radius of the Subject Property.

5.1.15 Unmappable/Orphan Sites

Thirteen (13) unmappable sites were identified in the Orphan Summary of the EDR Report. Unmappable sites are not plotted due to poor or inadequate address information. Due to the inaccurate or incomplete information provided by the respective agency, these sites cannot be plotted with confidence. Review of the site addresses and names coupled with ETC site reconnaissance findings indicated that neither the Subject Property nor adjacent properties were identified in the Orphan Summary of the database report.

5.2 Additional Environmental Record Sources

The EDR database also included a number of other regulatory databases that are not specified by the ASTM Practice. The Subject Property was not identified in any of the following databases.

ODI – Open Dump Inventory

DEBRIS REGION 9 – Torres Martinez Reservation Illegal Dump Site Locations

INDIAN ODI – Report on the Status of Open Dumps on Indian Lands

US CDL – Clandestine Drug Labs

US HIST CDL – National Clandestine Laboratory Register

LIENS 2 – CERCLA Line Information

HMIRS – Hazardous Materials Information Reporting System

HI SPILLS 90 – SPILLS 90 data from FirstSearch

DOT OPS – Incident and Accident Data

DOD – Department of Defense Sites

FUDS – Formerly Used Defense Sites

CONSENT – Superfund (CERCLA) Consent Decrees

ROD – Records of Decision

UMTRA – Uranium Mill Tailings Sites

TRIS – Toxic Chemical Release Inventory System

TSCA – Toxic Substances Control Act

FTTS – FIFRA/TSCA Tracking System

HIST FTTS – FIFRA/TSCA Tracking System Administrative Case Listing

SSTS – Section 7 Tracking Systems

ICIS – Integrated Compliance Information System

PADS – PCB Activity Database System

RADINFO – Radiation Information Database

RAATS – RCRA Administrative Action Tracking System

RMP – Risk Management Plans

UIC – Underground Injection Wells Listing

DRYCLEANERS – Permitted Drycleaner Facility Listing

AIRS – List of Permitted Facilities

INDIAN RESERV – Indian Reservations

SCRD DRYCLEANERS – State Coalition for Remediation of Drycleaners

US AIRS – Aerometric Information Retrieval System Facility Subsystem

PRP - Potentially Responsible Parties

US FIN ASSUR – Financial Assurance Information

EPA WATCH LIST – EPA WATCH LIST

LEAD SMELTERS – Lead Smelter Sites

COAL ASH DOE – Steam – Electric Plan Operation data

PCB Transformer – PCB Transformer Registration Database

COAL ASH EPA – Coal Combustion Residues Surface Impoundments List

EDR MGP – EDR Propriety Manufactured Gas Plants

RGA LF – Recovered Government Archive Solid Waste Facilities List

RGA LUST – Recovered Government Archive Leaking Underground Storage Tank

RGA HWS - Recovered Government Archive State Hazardous Waste Facilities List

5.3 Historical Use Information on the Subject and Adjoining Properties

Historical uses of the Subject Property and adjoining properties were investigated through the review of documentation available from public land records and State of Hawaii archived information. In addition, available aerial photographs, plat maps, Sanborn maps, and building permits were reviewed.

5.3.1 Aerial Photograph Review

ETC contracted EDR to conduct a search of aerial photographs for the Subject Property. A total of eight (8) aerial photographs were found to include the Subject Property. These photographs are dated 1952, 1968, 1976, 1978, 1985, 1992, 2000, and 2004.

The Subject Property appeared fully developed with a narrow building that wraps around the property boundaries and includes a central courtyard area in the 1952 aerial photograph. The southern portion of the Subject Property appeared to include a coastal beach area and may be submerged. The surrounding areas to the north, east, and west appear fully developed with structures that were likely a part of the military base. The user provided an aerial photograph from 1948 that appeared similar to this 1952 aerial photograph.

The building structures previously noted in the 1952 aerial photograph were not visible in the 1968 aerial photograph. The eastern portion of the Subject Property did appear to contain a warehouse. The area to the south of the Subject Property that was previously submerged has been filled in with land and included two large warehouses. The pier to the west of the Subject Property appeared developed and the remaining areas appeared further developed with industrial and commercial buildings.

The 1976 aerial photograph appeared similar to the 1968 aerial photograph; however, the groundcover had been paved and the Subject Property and surrounding areas appeared to be utilized for shipping container staging. The facility to the north of the Subject Property appeared to include three large tanks similar to those used by wastewater facilities. Facilities located to the east of the Subject Property were redeveloped with large warehouses.

The 1978 and 1985 aerial photographs appeared similar to the 1976 aerial photograph with no significant changes.

The Subject Property and surrounding areas in the 1992 aerial photograph appeared similar to the 1985 aerial photograph; however, the three tanks on the facility immediately north of the Subject Property were no longer visible. The user provided aerial photographs from 1988 and 1990 that appeared similar to this 1992 aerial photograph.

The 2000 aerial photograph appeared similar to the 1992 aerial photograph with no significant changes.

The Subject Property appeared similar in the 2004 aerial photograph to 2000 aerial photograph; however, the facility immediately east of the Subject Property appeared to be under redevelopment.

An aerial image was obtained of the Subject Property dated 2015 from Google Maps was reviewed and the previously noted warehouse had been removed and the area appeared to be utilized for parking. The southern portion of the Subject Property appeared to include a construction staging area. However, there were no structures visible. Additionally, the eastern adjacent property includes the campus for the University of Hawaii Cancer Center (UHCC) and John A. Burns School of Medicine (JABSOM).

5.3.2 Fire Insurance Maps

ETC contracted EDR to conduct a search of Sanborn fire insurance maps for the Subject Property. The search included an extensive review of the Library of Congress and University Publications of America map collections as well as the EDR Private Collection. There were no Sanborn maps available for the Subject Property in the ERIIS Historical Map Collection. The no coverage letter is provided in Appendix III.

5.3.3 Property Tax Files and Land Title Records

ETC conducted a limited chain of title search of the Subject Property at the City and County of Honolulu Real Property Tax office. ETC is not a professional title search company and does not warrant the completeness or accuracy of the information provided, but considers the data useful in screening the Subject Property for environmentally suspect owners or lessees. The Subject Property is identified as TMK (1) 2-1-015: Parcel 052. Chain of Title records for the Subject Property were available from 1935 through 2015.

The current listed owner of the Subject Property is Hawaii Community Development Authority (HCDA). Previous owners and occupants have included DOT Harbors Division Container Yard and Harbor Support Facilities, State of Hawaii, Territory of Hawaii, Overseas Terminal, Ltd., Inter-Island Steam Navigation Co. Ltd., US Immigration & Naturalization Service, Subsea Workboats, and Trustees of BP Bishop Estate. Previous occupants listed as part of the larger TMK (1) 2-1-015: Parcel 9 include Matson Navigation, TAMFAC, Inc., Contractor's Equipment and Service Corp, Hawaii Stevedores, Inc., Imps, Inc., Hawaii Crane & Rigging Ltd., McCabe, Hamilton, & Renny Co., and Aloha Cargo Agency Services, Inc.

5.3.4 Building Permit Records

A review of available building permits issued by the City and County of Honolulu for the larger TMK (1) 2-1-015: Parcel 9 indicated that the permits issued pertained to the construction of a "Wash and Service" building, a container stall, a molasses tank and pump unit, storage yards, offices, and a building for the storage and maintenance of vehicles. As a part of the Chain of Title records, several maps dated 1990 to 1992 identified this larger TMK as "Fort Armstrong" and included a "maintenance" building on the Subject Property.

6.0 SITE RECONNAISSANCE

ETC performed a site reconnaissance on May 29, 2015 in order to complete a visual survey to identify the use and/or storage of hazardous materials.

6.1 Methodology and Limiting Conditions

ETC personnel performed the site reconnaissance by systematically inspecting all accessible areas of the Subject Property. No areas of the Subject Property were restricted from ETC's visual observation.

6.2 General Site Setting

The Subject Property consists of approximately 5.5 acres of land used for vehicle parking. A map of the Subject Property is included in Appendix I, Figure 2. Photographic documentation of ETC's site reconnaissance is included in Appendix II.

6.3 Observations

Visual inspection of the exterior areas of the Subject Property indicated that the groundcover generally consists of asphalt and concrete. Although there were no potable water or sanitary sewer utilities provided at the Subject Property, manholes noted through the area indicated that City and County of Honolulu are available. An underground pipeline with approximately twenty storm water drain inlets was observed to traverse the Subject Property from north to south.

ETC personnel observed limited quantities of miscellaneous solid waste (i.e. trash, empty oil containers, etc.) throughout the Subject Property. Several small stockpiles were observed along eastern boundary of the Subject Property with Keawe Street. The stockpiles appeared to consist of fine sediment, debris, and asphalt cold plane similar to the debris that would result from sweeping the parking lot.

Other than *de minimis* oil staining typically associated with parking areas, no evidence of hazardous material or petroleum staining was observed on the concrete groundcover of the parking areas of the Subject Property.

6.3.1 USTs / ASTs

A visual inspection for the presence of USTs or aboveground storage tanks (ASTs) was also conducted. No visual evidence (i.e. vent or fill pipes, dispensers, etc.) to indicate the presence of USTs or ASTs was observed.

6.4 Dielectric Fluid Containing Equipment

A visual inspection for hydraulic and electrical equipment or electrical components that use fluid that may contain PCBs was conducted. Five pole mounted transformers were observed on three poles within the central portions of the Subject Property. Two of the transformers on pole 4, 522976 appeared to be rusted; however, there were no signs of a release from any of the transformers and HECO has indicated that they do not contain PCBs. No additional suspect PCB-containing equipment was observed in exterior areas of the Subject Property.

7.0 INTERVIEWS

The objective of the interviews is to obtain information from past and present owners, operators, and occupants of the Subject Property to identify potential RECs in connection with the Subject Property.

7.1 Interview with Subject Property Representative

Mr. Carson Schultz, Planner, HDCA (Subject Property Owner)

Mr. Schultz provided ETC with the following information regarding the Subject Property:

- Mr. Schultz's historical knowledge of the Subject Property dates back approximately 4 years.
- Currently the Subject Property is used as a parking area for JABSOM and UHCC as well as a construction staging area. The adjacent properties include industrial harbor operations, which may include refueling activities, a sewer pump station, higher education facility which includes chemical laboratories, and building material storage warehouse. The entire area has historically been used for industrial purposes.
- There are no utilities provided to the Subject Property; however a City and County of Honolulu sanitary sewer line runs underground through the site.
- There are electrical transformers owned by HECO on the Subject Property; however, it is not known if they have been tested for PCBs.
- There are no known aboveground storage tanks on the Subject Property. Mr. Schultz indicated that although he does not believe there are any underground storage tanks on the Subject Property, he cannot be certain.
- No hazardous materials or wastes are used or stored on the Subject Property.
- The Subject Property does not include a maintenance shop or gas station.
- The Subject Property was near a former waste incinerator and rubbish may have been deposited in the past. Additionally, adjacent sites have been historically used as landfill as part of the waste incinerator operation.
  - After subsequent research and consultation with other HCDA staff, Mr. Schultz indicated that it did not appear the Subject Property was used for landfill purposes.
- There are no known wastes or chemical pipelines that traverse the Subject Property other than the sanitary sewer line.
- There have been no damaged or discarded industrial batteries, pesticides, paints or other chemicals stored or used at the Subject Property in volumes greater than 50 gallons.

- There are no environmental liens or governmental notifications relating to past or recurrent violations of environmental laws with respect to the Subject Property.
- The Subject Property does not discharge wastewater on or adjacent to the site other than storm water.
- There is no known runoff from the adjacent properties onto the Subject Property.
- There are no current or former pits, ponds, or lagoons located on the Subject Property in connection with waste treatment or disposal.

8.0 FINDINGS AND OPINIONS

8.1 Site Description

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

8.2 User Provided Information

The user indicated that HAR §15-23 required land use restrictions on the Subject Property. Upon review of these regulations, they appear to pertain to zoning and proposed future development of the Kakaako area. However, the restrictions do not pertain to environmental concerns and therefore is considered a *de minimis* condition. No other significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

8.2.1 User Provided Documents

The documents provided by the user indicated that the Subject Property (Foreign Trade Zone) was identified as a potentially contaminant migration source for the current JABSOM/UHCC site (formerly the Produce Center). Document review indicated that the Subject Property was part of the Foreign Trade Zone site; and several potential environmental concerns within the Foreign Trade Zone property were identified including 'former USTs that were removed without proper soil sampling, visual observations of oil-stained ground surface, subsurface contamination originating from improper material storage, and potential USTs'. The Foreign Trade Zone area was historically part of Fort Armstrong and used as a military reservation. Document review also indicated that detectable concentrations of various contaminants were found in the soil along the Subject Property's east boundary (west border of the current JABSOM/UHCC site). While no analytical data was found for the Subject Property, based on ETC's review findings coupled with the historical use of the Subject Property, ETC cannot dismiss the possibility that residual contaminants associated with the historical use (i.e. former UST, storage practices, etc.) of the Subject Proepprty. As such, this finding is considered a REC.

8.3 Records Review

8.3.1 Standard Environmental Record Sources

Federal NPL and Delisted NPL

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

Federal CERCLIS and CERCLIS NFRAP

Database review of the *Kure Atoll, U.S. Coast Guard* active CERCLIS listing indicated that the facility listing likely pertained to the Kure Atoll, which is not located on the island of Oahu. Based on the location of the facility, ETC believes the facility does not pose a reasonable risk of impacting the Subject Property.

Database review of the *Amelco Corporation* CERCLIS NFRAP indicated that there had been a release related to the former storage practices of PCB wastes. The U.S. Coast Guard and Environmental Protection Agency (EPA) conducted clean-ups at the site and final analysis indicated that PCB and associated contaminant concentrations in remaining surface soils were below action levels and that shallow groundwater had been impacted. The site is topographically upgradient (0.3 miles north) of the Subject Property; however, based on the distance and the fact that the source has been removed, contaminant migration from this release does not pose a reasonable risk of impacting the Subject Property.

No other significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

Federal RCRA CORRACTS

Review of the *Hawaiian Electric Company Generation Station* RCRA CORRACTS facility file at the DOH SHWB indicated that the facility was under a RCRA corrective action for the closure of three sumps at the Honolulu generator station. In addition, database review indicated that the facility is classified as a "low corrective action" priority. This facility is situated topographically crossgradient from the Subject Property, and it is located greater than 0.25-mile from the Subject Property. Therefore, based on ETC's file review, contaminant migration from this facility does not pose a reasonable risk of impacting the Subject Property.

Federal RCRA (non-CORRACTS) TSD Facilities

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

Federal RCRA Generator

Review of both the *Ala Moana Center – Upper Level Expansion Phase V-A* RCRA facility file indicated that the facility is located on the north adjacent property. The facility is classified as a Conditionally Exempt SQG (CESQG) and no violations have been documented.

Database review of the *Produce Center Dev. Ltd.* facility indicated that the facility was formerly located on the eastern adjacent property. The facility was classified as CESQG and no violations have been documented.

Based on database and file review findings, none of the database identified facilities pose a reasonable risk of impacting the Subject Property.

Federal Institutional Control/Engineering Control Registries

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

Federal ERNS

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

State Equivalent NPL and CERCLIS

ETC's database review indicated that thirty-six (36) of the forty-one (41) identified SHWS sites were either classified as "no further action" sites, are situated topographically downgradient or crossgradient from the Subject Property, and/or were too distant to pose a reasonable risk of impacting the Subject Property. ETC did review five (5) facility files from the DOH HEER office. Note that the *Ala Moana Wastewater Pump Station* and *Kakaako Pump Station* are a part of Brownfields sites further discussed as a part of Section 8.3.2. and will not be repeated here.

Review of the *Kewalo Incinerator* facility file indicated that a release was observed during the closure one 1,500 gallon diesel UST in September 1994. The former UST was not considered to be a RCRA regulated UST, therefore, the facility file was transferred to the DOH HEER office for direct oversight. File review of the *Kewalo Incinerator/Ash Dump* facility also indicated that site cleanup activities have been completed. The subsurface soils at the facility were noted to be impacted with heavy metals. The facility was capped and is currently the Kakaako Waterfront Park and is used for recreational purposes. In addition, database review also indicated that the current facility usage is an institutional control (use restriction). Furthermore, the facility is located topographically downgradient from the Subject Property. While this facility is not considered a REC, the historic fill material found in the surrounding Kakaako area is suspected to have been associated with the *Kewalo Incinerator/Ash Dump* facility. The suspect historic fill material in the surrounding areas is discussed further in Section 8.3.2.

Review of the *595 Ala Moana Black Oil Pipeline* indicated that during routine inspections Hawaii Department of Transportation, Highways Division had noted an illegal connection to their storm drain system that resulted in the release of bunker oil. The Highways Division required the responsible party to block the drain line and continues to monitor the impacted manholes. Since the oil release likely remained within the storm drain system, it does not appear to pose a reasonable risk of impacting the Subject Property.

Although, the DOH did not have records readily available for the *HCDA / UH Health and Wellness Center*, it was reviewed as a part of the user provided documents in Section 8.2.1 and will not be repeated here. No other significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

State Landfill and/or Solid Waste Disposal

No significant findings to indicate suspect RECs, historical RECs, or de minimis conditions were identified.

State Leaking Underground Storage Tanks

Database and file review indicated that twenty-nine (29) of the thirty-two (32) LUST sites were classified as "no further action" sites; disconfirmed releases; situated topographically downgradient or crossgradient from the Subject Property; and/or too distant to reasonably impact the Subject Property. Therefore, ETC reviewed three (3) LUST facility files for the *Verizon Hawaii, Produce Center Dev. Ltd.,* and *Roberts Hawaii Tours* sites at the DOH SHWB.

Review of the *Verizon Hawaii (9-100496)* facility file indicated that a release was observed during the closure of a 10,000 gallon gasoline UST in May 1997. Release response activities were performed including contaminant plume delineation. Analysis of groundwater samples indicated that the contamination was contained to the vicinity of the former UST and subsequently the DOH issued a letter on September 25, 1998 indicating that "no further action" was required in response to the release. Based on file review findings, ETC believes that contaminant migration from this facility does not pose a reasonable risk of impacting the Subject Property.

Review of the *Produce Center Dev. Ltd. (9-101735)* LUST facility file indicated that the site was located on the eastern adjacent property to the Subject Property. A release was observed during the closure of three USTs (4,000-gal diesel, 5,000-gal gas, and 6,000-gal gas) in August 1994. Subsequent release response activities included contaminant plume delineation to the vicinity of the former USTs. Subsequently the DOH issued a letter on June 1, 2001 indicating that "no further action" was required in response to the release. Based on file review findings, ETC believes that contaminant migration from this facility does not pose a reasonable risk of impacting the Subject Property.

Review of the *Roberts Hawaii (9-100893)* LUST facility file indicated that the site was located approximately 0.2 miles southeast of the Subject Property. A release was observed from a 1,000-gallon used oil UST during the closure of that tank as well as a 12,000-gallon diesel UST and a 6,000-gallon gasoline UST in 1991. Subsequent release response activities concluded that identified elevated concentrations of lead and cadmium were due to landfill from the Kewalo Municipal Incinerator. The DOH indicated that "no further action" was required for the UST release in a February 13, 1996 letter. Based on file review findings, ETC believes that contaminant migration from the UST does not pose a reasonable risk of impacting the Subject Property. Use of the area for landfill activities is further discussed in Section 8.3.2.

State Registered Underground Storage Tanks

Although not identified by the contracted database, User provided information indicated that former USTs may have been removed from the Subject Property without property soil sampling. This finding is discussed in Section 8.2.1 and therefore will not be repeated here. No other significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

State Institutional Control Registry

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

State Voluntary Cleanup/Response Sites

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

State Brownfields

Database review of *WRAF-Hawaii Tuna Packers* indicated that site clean-up activities are currently ongoing for petroleum and heavy metal impacts to the soil as well as ethylbenzene impacts to the groundwater. This site is situated topographically crossgradient (approximately 0.4 miles east) from the Subject Property. Therefore, contaminant migration from this facility does not pose a reasonable risk of impacting the Subject Property. No other significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

Unmappable/Orphan Sites

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

8.3.2 Additional Environmental Record Sources

Database review of the five (5) local Brownfields sites indicated the identified sites are collectively known as the *Kakaako Brownfields (i.e. Unit 6, Unit 7, Unit 8, Historic Ala Moana Pump Station, and Makai Parcel).* Except for the Historic Ala Moana Pump Station and the Makai Parcel 1, the *Kakaako Brownfields* site generally includes multiple sites bound by Ohe Stree, Ilalo Street and the Kewalo Basin. Review of the *Makai Parcel* file indicated that a sludge pit had been discovered at Ilalo and Cooke Street (approximately 0.15 miles east of the Subject Property). The pit was overexcavated and no contaminants were detected in collected groundwater samples. As a result the DOH submit a "no further action" (NFA) letter in regards to the release.

Review of the *Kakaako Pump Station (aka the Historic Ala Moana Pumping Station)* facility file indicated that the site is located north of Ilalo Street, which is topographically upgradient and adjacent to the northern boundary of the Subject Property. Document review indicated that detectable concentrations of petroleum constituents and metals in soil and groundwater were identified within the active Ala Moana WWPS site and the northwest portion of the Historic Ala Moana Pumping Station property. The petroleum and metal contaminants were suspected to be associated with the historic land filling operations in the Kakaako area.

In addition to those identified by the contracted database, additional Brownfields sites were included in the *Kakaako Brownfields* file (i.e. Unit 2, Unit 4, etc.). *Unit 6* pertains to the *WRAF-Hawaii Tuna Packers* previously discussed and *Units 7 and 8* located approximately 0.4 miles to the east and crossgradient of the Subject Property. Investigative reports indicate that petroleum and heavy metal contaminants are present in the soil and/or groundwater throughout *Kakaako Brownfields*. Review indicated that the impacts were suspected to be associated with the historic usage of the area and the former *Kewalo Incineratory/Ash Dump* site. Based on these findings, ETC cannot dismiss the possibility that residual contaminants associated with the historic use and suspect fill operations may be present on the Subject Property. As such, this finding is considered a REC.

8.3.3 Historical Use Information on the Subject and Adjoining Properties

Aerial Photograph Review

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

Fire Insurance Maps

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

Property Tax Files and Land Title Records

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

Building Permits

No significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

8.4 Site Reconnaissance

The two HECO pole mounted transformers observed on the Subject Property did have any signs of degradation. HECO has indicated that the transformers belong to them and do not contain PCBs. Based on these findings, the observed transformers were not considered RECs for the Subject Property.

Limited petroleum-like staining on the pavement was observed throughout the Subject Property; however such staining is considered typical parking lots and it therefore considered a *de minimis* condition.

Stockpiles of apparent sweeping debris were observed along the eastern boundary of the Subject Property. These stockpiles were not considered to be a significant concern for the Subject Property.

No other significant findings to indicate suspect RECs, historical RECs, or *de minimis* conditions were identified.

8.5 Interviews

Mr. Schultz had initially indicated that he thought there was a possibility that the Subject Property may have been used for landfill purposes from incinerator operations in the area. However, upon further consultation with other HCDA staff and document review, he concluded that it did not appear the Subject Property was used for landfill purposes. Based on the information provided, although the Subject Property was reportedly not used for or part of the former landfill, document review indicated that several sites in the vicinity are suspected to be impacted with fill material associated with the former landfill. The historic land use and document review is discussed as a part of Section 8.3.2 and therefore will not be repeated here.

9.0 DATA GAPS

Data gaps, which are defined as the lack of or inability to obtain information required for this Phase I ESA despite good faith efforts by the environmental professional to gather such information, were identified during this Phase I ESA. ETC identified the following data gaps:

- Historical records sources within five year intervals were not available for review. However, since all available historical records were reviewed (i.e. aerial photos, Sanborn Maps, Chain of Title, etc.), ETC concludes that this "data failure" does not represent a significant data gap.

10.0 CONCLUSIONS

We have performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E1527-13 of TMK (1) 2-1-015: Parcel 052 located at Ilalo Street & Keawe Street, Honolulu, Hawaii, the Subject Property. Any exceptions to, or deletions from, the ASTM Practice E1527-05/13 are described in Section 11.0 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the Subject Property except:

- Potential presence of contaminants associated with the historical usage, operations (i.e former UST, storage practices, etc.), and suspect fill operations on the Subject Property.

11.0 DEVIATIONS AND ADDITIONAL SERVICES

No client imposed constraints or additions were requested. No additional services were requested by ETC's Client. As such, there were no deviations and/or deletions from the ASTM Practice E1527-13 upon completion of this Phase I ESA.

12.0 ENVIRONMENTAL PROFESSIONAL CERTIFICATION

We declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Subject Property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Prepared by:

Katie Davis

Katie Davis
Environmental Professional
EnviroServices & Training Center, LLC

July 2015

Reviewed by:

Sharla M Nakashima

Sharla Nakashima
Environmental Professional
EnviroServices & Training Center, LLC

July 2015

13.0 REFERENCES

- ASTM International. *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation E1527-13*.
- City and County of Honolulu, Department of Planning and Permitting, *Building Permit Records*.
- Environmental Data Resources, Inc., May 11, 2015. *The EDR Aerial Photo Decade Package*. Report Inquiry No. 4291430.5
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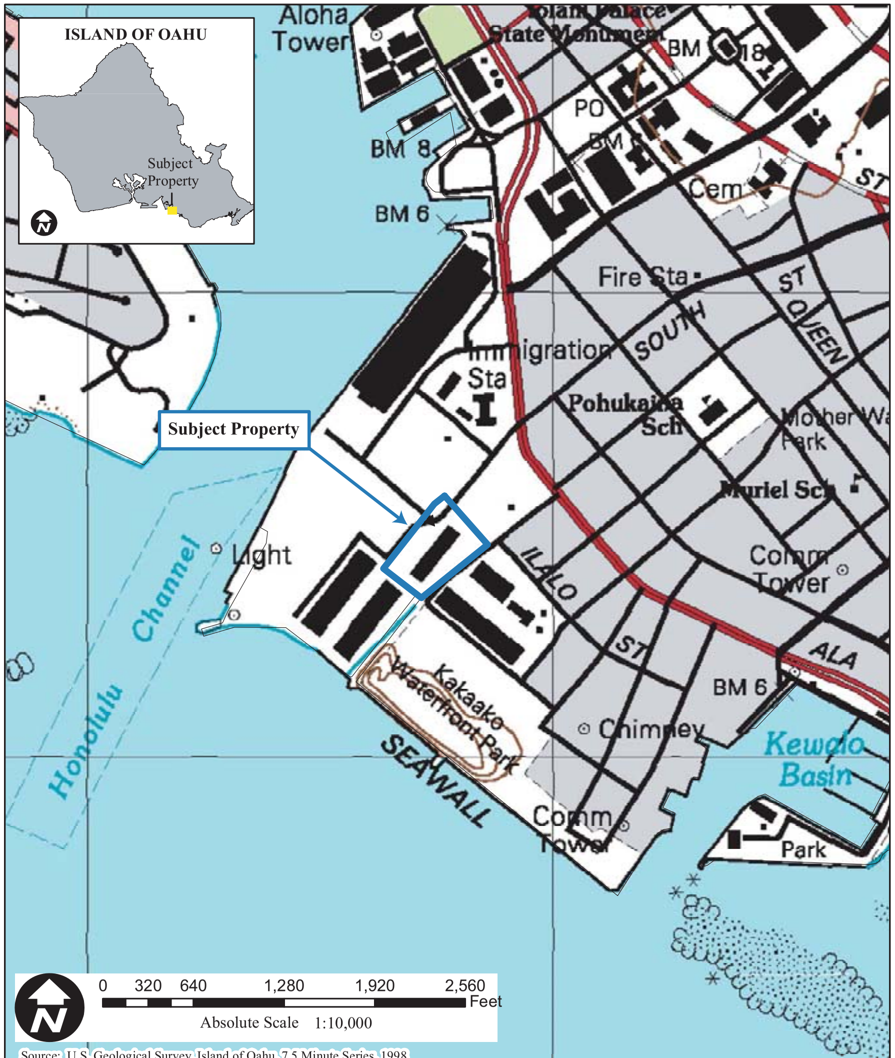
- State of Hawaii Department of Health, Hazard Evaluation and Emergency Response Office records.
- State of Hawaii Department of Health, Solid and Hazardous Waste Branch records.
- State of Hawaii Taxation Map Bureau, Tax Map Key (1) 2-1-015: Parcel 052.
- U.S. Department of Agriculture Soil Conservation Service. 1972. *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*.
- U.S. Department of Interior Geological Survey. 1998. Honolulu Quadrangle, 7.5 Minute Series (Topographic Maps).

APPENDIX I
FIGURES



ETC Project 15-1006

July 2015

Figure 1: Site Location Map
Phase I Environmental Site Assessment
Ilalo Street & Keawe Street
Honolulu, Oahu, Hawaii
TMK (1) 2-1-015: Parcel 052

Legend:
- Subject Property Boundary
- Fenceline
- Storm Drain Inlets and Pipeline

Source: Aerial Image from Google Earth

Project 15-1006

Scale
1" = 120'

July 2015

Figure 2 - Site Map
Phase I Environmental Site Assessment
Ilalo Street & Keawe Street
Honolulu, Oahu, Hawaii
TMK (1) 2-1-015: Parcel 052

APPENDIX II
PHOTOGRAPHIC DOCUMENTATION

Photograph 1: Parking lot entrance on the north side of the Subject Property.

Photograph 2: View to the south of the storm drain inlets and underground pipeline that runs through the center of the Subject Property.

Photograph 3: Non-PCB HECO transformers that appeared to be rusting.

enviro SERVICES & TRAINING CENTER, LLC	ETC Job. 15-1006	**Photographic Documentation**
	Page 1	Phase I Environmental Site Assessment Ilalo Street & Keawe Street Honolulu, Oahu, Hawaii
	July 2015	TMK (1) 2-1-015: Parcel 052

Photograph 4: Stockpiles visible on the eastern boundary of the parking lot.

Photograph 5: Trash and other debris observed along the eastern boundary of the Subject Property.

Photograph 6: Trash and other debris observed along the eastern boundary of the Subject Property.

Photograph 7: Apparent petroleum staining noted within a vacant area of the Subject Property formerly used for construction staging.

Photograph 8: Apparent petroleum staining noted within a vacant area of the Subject Property formerly used for construction staging.

Photograph 9: Apparent petroleum staining noted within a vacant area of the Subject Property formerly used for construction staging.

APPENDIX C:

Traffic Impact Report
Wilson Okamoto Corporation, July 2015.

Traffic Impact Report

Kakaako Makai
Innovation Block at Lot "C"

Prepared for:
Ferraro Choi & Associates, Ltd.

Prepared by:
Wilson Okamoto Corporation

July 2015

TRAFFIC IMPACT REPORT

FOR THE

KAKAAKO MAKAI

INNOVATION BLOCK AT LOT "C"

Prepared for:

Ferraro Choi & Associates, Ltd.
1240 Ala Moana Boulevard, Suite 510
Honolulu, HI 96814

Prepared by:

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826
WOC Ref #10063-03

July 2015

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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 Kakaako Makai Innovation Block at Lot "C" development located adjacent to Ilalo Street in Kakaako on the island of Oahu. The proposed project by the High Technology Development Corporation (HTDC) entails the replacement of an existing parking lot with office and commercial space for the development of high technology and enterprise, as well as, a new parking garage.

B. Scope of Study

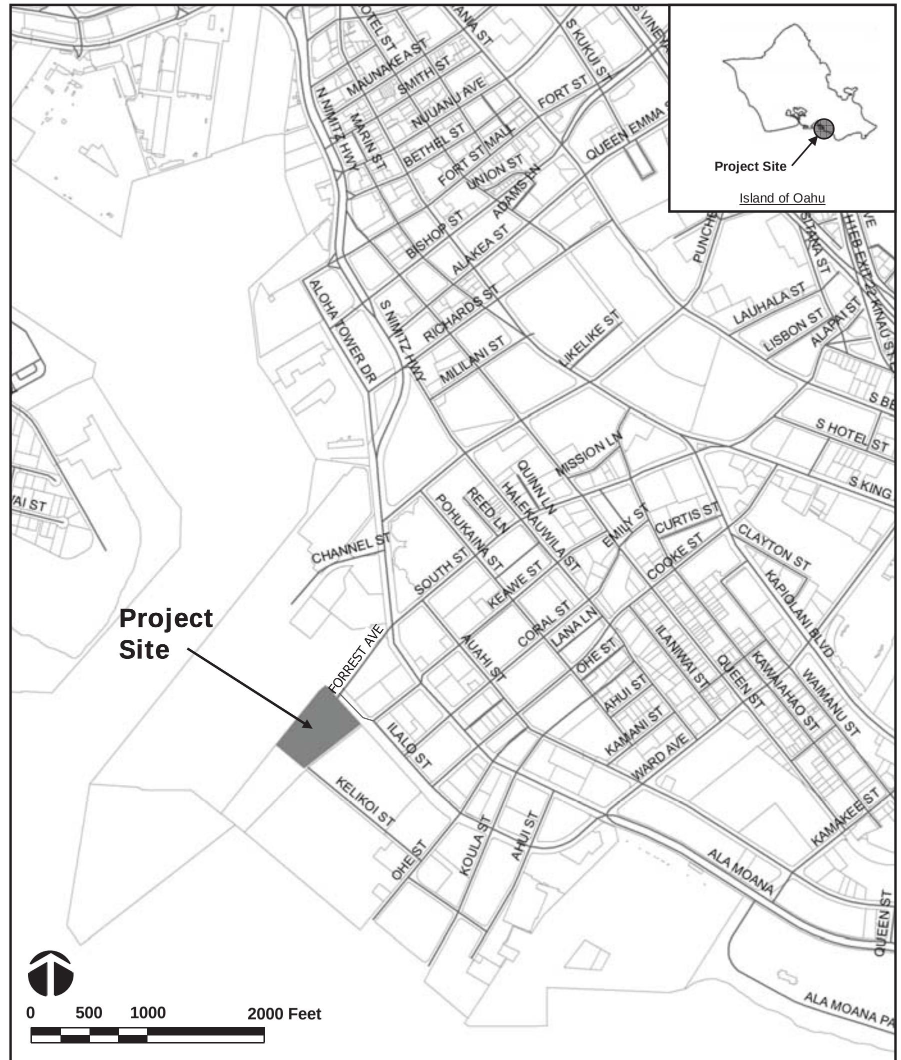
This report presents the findings and conclusions of the traffic study, the scope of which includes:

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 proposed Kakaako Makai Innovation Block at Lot "C" will be located along Ilalo Street near the existing John A. Burns School of Medicine (JABSOM) and University of Hawaii Cancer Research Center (UHCRC) facilities in Kakaako on the island of Oahu (see Figure 1). The project site is bounded by Ilalo Street to the north, Keawe Street to the east, and industrial uses to the south and west, and is further identified as Tax Map Key 2-1-15: 052. Access to the project site will be provided via driveways off Ilalo Street and Keawe Street.



WILSON OKAMOTO CORPORATION

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

LOCATION MAP AND VICINITY MAP

FIGURE 1

B. Project Characteristics

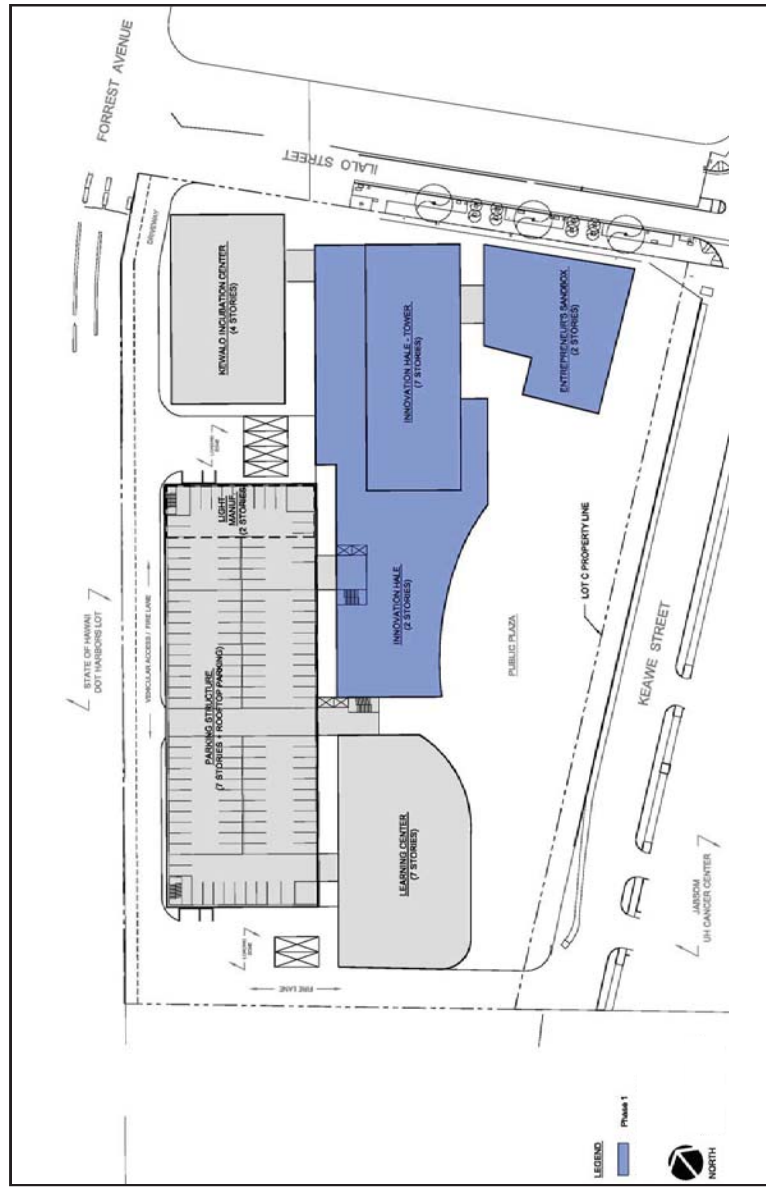
The project site for the proposed development currently houses an at-grade parking lot that currently provides parking for the adjacent JABSOM and UHCRC facilities, as well as, other uses in the vicinity. The proposed project is expected to be developed in four phases over the next 5 years with at-grade parking continued to be provided on-site within available at-grade parking areas until the proposed parking structure is completed. It should be noted that parking for the adjacent JABSOM and UHCRC facilities is expected to continue to be accommodated on-site during the project development and after project completion. Phases 1A and 1B are expected to be completed by the Year 2018 and include the following:

- Phase 1A (referred to as the "Entrepreneur's Sandbox")
  - ~13,500 square feet (sq ft) of office space
- Phase 1B (referred to as the "Innovation Hale")
  - ~87,600 sq ft of office space
  - ~62,062 sq ft of commercial space

In addition, a new driveway off Keawe Street is expected to be included in this phase of the project. Phases 2 and 3 are expected to be completed by the Year 2020 and include the following:

- Phase 2 (referred to as the "Kewalo Incubation Center")
  - ~47,181 sq ft of office space
  - Also includes the construction of an on-site parking structure with ~900 parking stalls and ~10,000 sq ft of light manufacturing facilities
- Phase 3 (referred to as the "Learning Center")
  - ~139,786 sq ft of office space

Access is expected to be provided via an existing driveway off Ilalo Street and a new driveway off Keawe Street. Figure 2 shows the proposed project site plan.



KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

PROPOSED SITE PLAN

FIGURE 2

WILSON OKAMOTO CORPORATION

III. EXISTING TRAFFIC CONDITIONS

A. Area Roadway System

The proposed Kakaako Makai Innovation Block at Lot "C" will be located south of Ala Moana Boulevard in Kakaako. At the western edge of the study area, Ala Moana Boulevard intersects South Street and Forrest Avenue. In the vicinity of the project site, Ala Moana Boulevard is a predominantly six-lane, two-way roadway generally oriented in the east-west direction. At this signalized intersection the eastbound approach of Ala Moana Boulevard has an exclusive left-turn lane, two through lanes, and a shared through and right-turn lane while the westbound approach has two through lanes and a shared through and right-turn lane. South Street is a four-lane, two-way roadway between Ala Moana Boulevard and Pohukaina Street that transitions to a four-lane, one-way (northbound) roadway. At the intersection with Ala Moana Boulevard, the South Street approach has a shared left-turn and through lane, and an exclusive right-turn lane. It should be noted that there are posted signs at the intersection indicating southbound right-turn movements are prohibited on red. The northbound approach of the intersection is comprised of Forrest Avenue which serves as a connector roadway between Ala Moana Boulevard and Ilalo Street. At the intersection with Ala Moana Boulevard and South Street, the northbound approach of Forrest Avenue has exclusive turning lanes and one through lane.

East of the intersection with South Street and Forrest Avenue, Ala Moana Boulevard intersects Keawe Street. At this signalized intersection, both approaches of Ala Moana Boulevard have an exclusive left-turn lane, two through lanes, and a shared through and right-turn lane. Keawe Street is a two-lane, two-way roadway with an offset between the northbound and southbound approaches. At the intersection with Ala Moana Boulevard, both approaches of Keawe Street have one lane that serves all traffic movements.

Further east, Ala Moana Boulevard intersects Coral Street. At this signalized intersection, both approaches of Ala Moana Boulevard have an exclusive left-turn lane, two through lanes, and a shared through and right-turn lane. Coral Street is a two-lane, two-way roadway generally oriented in the north-south direction between

Pohukaina Street and Ilalo Street. At the intersection with Ala Moana Boulevard, both approaches of Coral Street have one lane that serves all traffic movements.

At the eastern edge of the study area, Ala Moana Boulevard intersects Cooke Street. At this signalized intersection, both approaches of Ala Moana Boulevard have an exclusive left-turn lane, two through lanes, and a shared through and right-turn lane. Cooke Street is a predominantly four-lane, two-way roadway generally oriented in the north-south direction that serves as a connector road between the east-west corridors in the region. At the intersection with Ala Moana Boulevard, both approaches of Cooke Street have a shared left-turn and through lane, and an exclusive right-turn lane.

South of Ala Moana Boulevard, Ilalo Street is a predominantly two-lane, two-way divided roadway generally oriented in the east-west direction that runs parallel to Ala Moana Boulevard. At the western edge of the study area, Ilalo Street intersects Forrest Avenue. At this all-way stop controlled T-intersection, the westbound approach of Ilalo Street has one lane that serves left-turn and right-turn traffic movements while the southbound approach of Forrest Avenue has an exclusive left-turn lane and two through lanes. The northbound approach of the intersection is comprised of an access roadway for the adjacent piers that has one through lane and a shared through and right-turn lane at the intersection with Ilalo Street.

East of the intersection with Forrest Avenue, Ilalo Street intersects Keawe Street. At this unsignalized intersection, both approaches of Ilalo Street have one lane that serves all traffic movements. The Keawe Street approaches of the intersection have one stop-controlled lane that serves all traffic movements.

Further east, Ilalo Street intersects Coral Street. At this unsignalized T-intersection, the eastbound approach of Ilalo Street has a shared left-turn and through lane while the westbound approach has a shared through and right-turn lane. The Coral Street approach of the intersection has one stop-controlled lane that serves left-turn and right-turn traffic movements.

At the eastern edge of the study area, Ilalo Street intersects Cooke Street. At this all-way stop controlled intersection, both approaches of Ilalo Street have one lane that serves all traffic movements. The northbound approach of Cooke Street has one lane that serves all traffic movements while the southbound approach has a shared left-turn and through lane, and an exclusive right-turn lane.

B. Traffic Volumes and Conditions

1. General

a. Field Investigation

Field investigations were conducted in May 2015 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:

- Ala Moana Boulevard, South Street, and Forrest Avenue
- Ala Moana Boulevard and Keawe Street
- Ala Moana Boulevard and Coral Street
- Ala Moana Boulevard and Cooke Street
- Ilalo Street and Forrest Avenue
- Ilalo Street and Keawe Street
- Ilalo Street and Coral Street
- Ilalo Street and Cooke 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

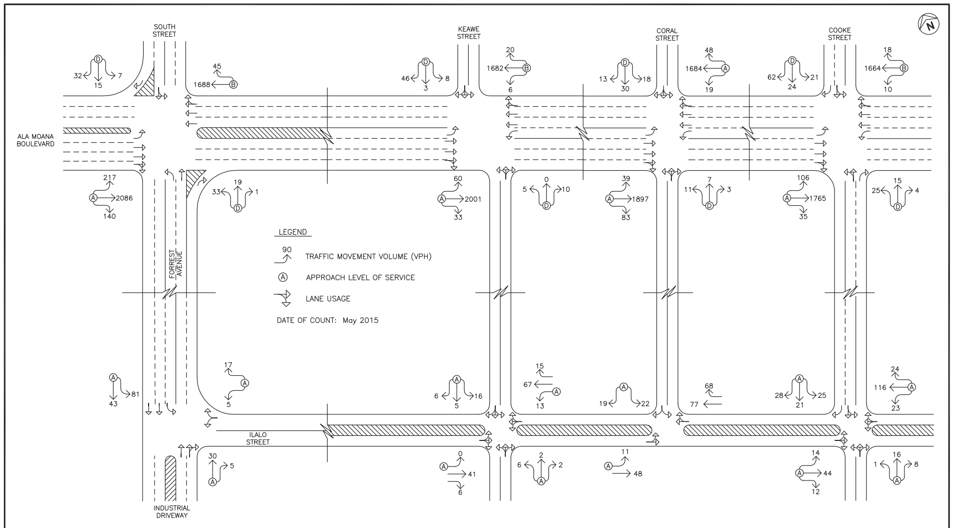
a. General

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

b. Ala Moana Boulevard, South Street, and Forrest Avenue

At the intersection with South Street and Forrest Avenue, Ala Moana Boulevard carries 2,443 vehicles eastbound and 1,733 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 2,433 vehicles traveling eastbound and 1,762 vehicles traveling westbound. The eastbound approach of Ala Moana Boulevard operates at LOS "A" during both peak periods while the westbound approach operates at LOS "B" during both peak periods.

South Street carries 54 vehicles and 157 vehicles southbound during the AM and PM peak periods, respectively, while Forrest Avenue carries 53 vehicles and 150 vehicles northbound during the AM and PM peak periods, respectively. The South Street and Forrest Avenue approaches of the intersection operate at LOS "D" during both peak periods.



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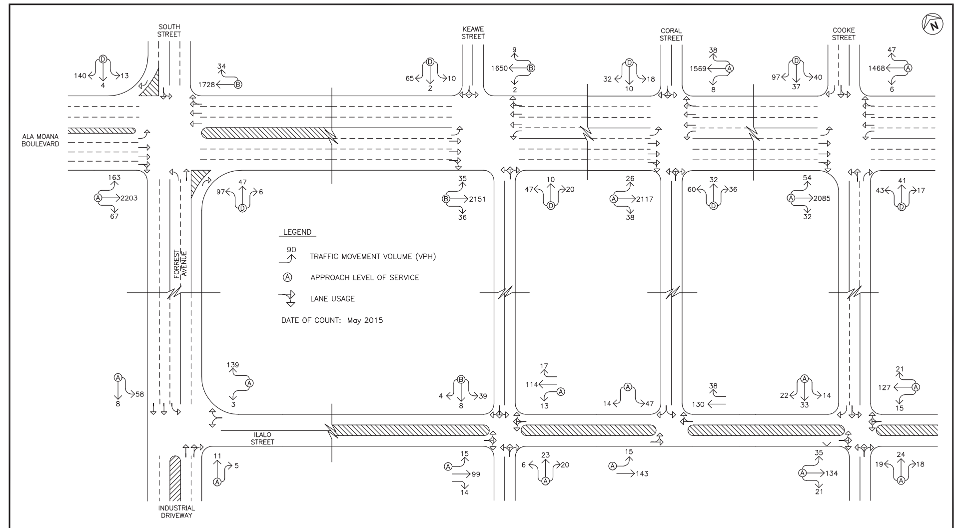
KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

EXISTING AM PEAK HOUR OF TRAFFIC

FIGURE 3



WILSON OKAMOTO CORPORATION

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

EXISTING PM PEAK HOUR OF TRAFFIC

FIGURE 4

c. Ala Moana Boulevard and Keawe Street

At the intersection with Keawe Street, Ala Moana Boulevard carries 2,094 vehicles eastbound and 1,708 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 2,222 vehicles traveling eastbound and 1,661 vehicles traveling westbound. The eastbound approach of Ala Moana Boulevard operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively, while the westbound approach operates at LOS "B" during both peak periods.

Keawe Street carries 15 vehicles northbound and 57 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 77 vehicles traveling northbound and 77 vehicles traveling southbound. Both approaches of Keawe Street operate at LOS "D" during both peak periods.

d. Ala Moana Boulevard and Coral Street

At the intersection with Coral Street, Ala Moana Boulevard carries 2,019 vehicles eastbound and 1,751 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 2,181 vehicles traveling eastbound and 1,615 vehicles traveling westbound. Both approaches of Ala Moana Boulevard operate at LOS "A" during both peak periods.

Coral Street carries 21 vehicles northbound and 61 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 128 vehicles traveling northbound and 60 vehicles traveling southbound. Both approaches of Coral Street operate at LOS "D" during both peak periods.

e. Ala Moana Boulevard and Cooke Street

At the intersection with Coral Street, Ala Moana Boulevard carries 1,906 vehicles eastbound and 1,692 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 2,171 vehicles traveling eastbound and 1,521

vehicles traveling westbound. The eastbound approach of Ala Moana Boulevard operates at LOS "A" during both peak periods while the westbound approach operates at LOS "B" and LOS "A" during the AM and PM peak periods, respectively.

Cooke Street carries 44 vehicles northbound and 107 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 101 vehicles traveling northbound and 174 vehicles traveling southbound. Both approaches of Cooke Street operate at LOS "D" during both peak periods.

f. Ilalo Street and Forrest Avenue

At the intersection with Forrest Avenue, Ilalo Street carries 22 vehicles and 142 vehicles westbound during the AM and PM peak periods, respectively. This approach operates at LOS "A" during both peak periods.

Forrest Avenue carries 124 vehicles and 66 vehicles southbound during the AM and PM peak periods, respectively and operates at LOS "A" during both peak periods. The northbound approach of the intersection is comprised of an access road for the adjacent piers which carries 35 vehicles and 16 vehicles northbound during the AM and PM peak periods, respectively. This approach operates at LOS "A" during both peak periods.

g. Ilalo Street and Keawe Street

At the intersection with Keawe Street, Ilalo Street carries 47 vehicles eastbound and 95 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 128 vehicles traveling eastbound and 144 vehicles traveling westbound. The eastbound and westbound left-turn traffic movements operate at LOS "A" during both peak periods.

Keawe Street carries 10 vehicles northbound and 27 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 49 vehicles traveling northbound and

51 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.

h. Ilalo Street and Coral Street

At the intersection with Coral Street, Ilalo Street carries 59 vehicles eastbound and 145 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 158 vehicles traveling eastbound and 168 vehicles traveling westbound. The eastbound left-turn traffic movement operates at LOS "A" during both peak periods.

Coral Street carries 41 vehicles and 61 vehicles southbound during the AM and PM peak periods, respectively. This approach operates at LOS "A" during both peak periods.

i. Ilalo Street and Cooke Street

At the intersection with Cooke Street, Ilalo Street carries 70 vehicles eastbound and 163 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 190 vehicles traveling eastbound and 163 vehicles traveling westbound. Both approaches of Ilalo Street operate at LOS "A" during both peak periods.

Cooke Street carries 25 vehicles northbound and 74 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 61 vehicles traveling northbound and 69 vehicles traveling southbound. Both approaches of Cooke Street operate at LOS "A" during both peak periods.

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 1,000 square feet of development. It should be noted that all site-generated trips were conservatively assumed to be new trips in the project vicinity although some of the facilities within the proposed Kakaako Makai Innovation Block at Lot "C" are expected to serve the existing students and faculty of the adjacent JABSOM and UHCRC facilities. Tables 1 and 2 summarize the trip generation characteristics related to the proposed implementation of the Kakaako Makai Innovation Block at Lot "C" applied to the AM and PM peak hours of traffic.

Table 1: Year 2018 Peak Hour Trip Generation

YEAR 2018 PHASES 1A AND 1B		
OFFICE (GENERAL OFFICE BUILDING) INDEPENDENT VARIABLE:		1,000 sf of development = 101.1
		PROJECTED TRIP ENDS
AM PEAK	ENTER	139
	EXIT	19
	TOTAL	158
PM PEAK	ENTER	25
	EXIT	126
	TOTAL	151
RETAIL (SHOPPING CENTER) INDEPENDENT VARIABLE:		1,000 sf of development = 62.062
		PROJECTED TRIP ENDS
AM PEAK	ENTER	37
	EXIT	23
	TOTAL	60
PM PEAK	ENTER	111
	EXIT	119
	TOTAL	230

Table 1: Year 2018 Peak Hour Trip Generation (Cont'd)

YEAR 2018 PHASES 1A AND 1B		
TOTALS		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	176
	EXIT	42
	TOTAL	218
PM PEAK	ENTER	136
	EXIT	245
	TOTAL	381

Table 2: Year 2020 Peak Hour Trip Generation

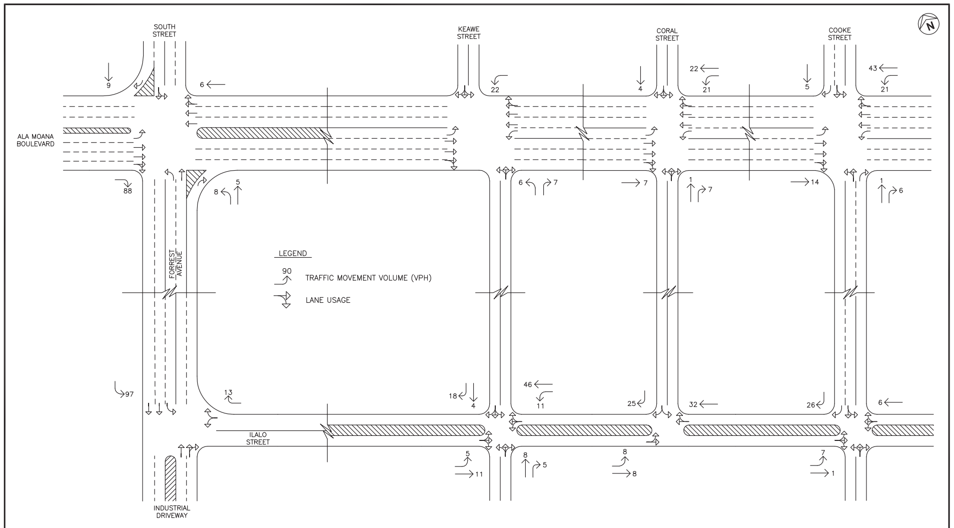
YEAR 2020 (FROM YEAR 2018) PHASES 2 AND 3		
OFFICE (GENERAL OFFICE BUILDING)		
INDEPENDENT VARIABLE:		1,000 sf of development = 186.967
		PROJECTED TRIP ENDS
AM PEAK	ENTER	257
	EXIT	35
	TOTAL	292
PM PEAK	ENTER	47
	EXIT	231
	TOTAL	278
INDUSTRIAL (MANUFACTURING)		
INDEPENDENT VARIABLE:		1,000 sf of development = 10
		PROJECTED TRIP ENDS
AM PEAK	ENTER	5
	EXIT	2
	TOTAL	7
PM PEAK	ENTER	3
	EXIT	4
	TOTAL	7
TOTALS		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	262
	EXIT	37
	TOTAL	299
PM PEAK	ENTER	50
	EXIT	235
	TOTAL	285

2. Trip Distribution

Figures 5 through 8 show the distribution of site-generated vehicular trips at the study intersections during the Year 2018 and Year 2020 peak hours of traffic. Access is expected to be provided via driveways off Ilalo Street and Keawe Street. Site-generated vehicles were split between the two driveways based on their assumed origin/destination and the relative convenience of the available routes. The directional distribution of all site-generated vehicles was based upon the directional distribution of traffic along Ala Moana Boulevard. As such, 54.7% of vehicles were assumed to be headed eastbound and 45.3% were assumed to be headed westbound during the AM peak period. During the PM peak period, 55.7% were assumed to be headed eastbound and 44.3% were assumed to be headed westbound. All eastbound entering vehicles were assumed to utilize Forrest Avenue to access Ilalo Street while all westbound entering vehicles were split between Ilalo Street, Ala Moana Boulevard, Cooke Street, and Coral Street based upon the relative distribution of existing traffic along those roadways.

B. Through Traffic Forecasting Methodology

The travel forecast utilized for this study is based on the Oahu Metropolitan Planning Organization (OMPO) regional forecasting model which includes the development of other projects in the vicinity. The use of the OMPO model more accurately reflects the anticipated impacts of traffic growth on the island more than the use of historical traffic count data. The travel forecast utilized for the OMPO model is based on Societal Economic Data (SED) which represents the population distribution within a multitude of traffic analysis zones. As such, since population estimates for the island of Oahu indicate that population growth is expected to be relatively linear to the Year 2035, a linear growth in traffic was also assumed over that period. Consequently, the traffic forecast from the OMPO model was scaled appropriately to determine Year 2018 and Year 2020 traffic volumes.

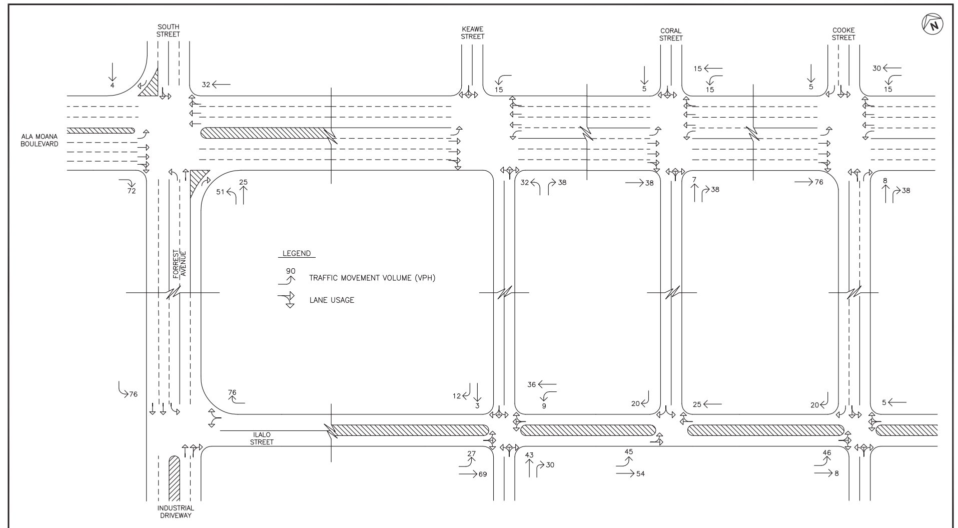


WILSON OKAMOTO CORPORATION

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

PROJECTED YEAR 2018 DISTRIBUTION OF SITE-GENERATED VEHICLES
AM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 5

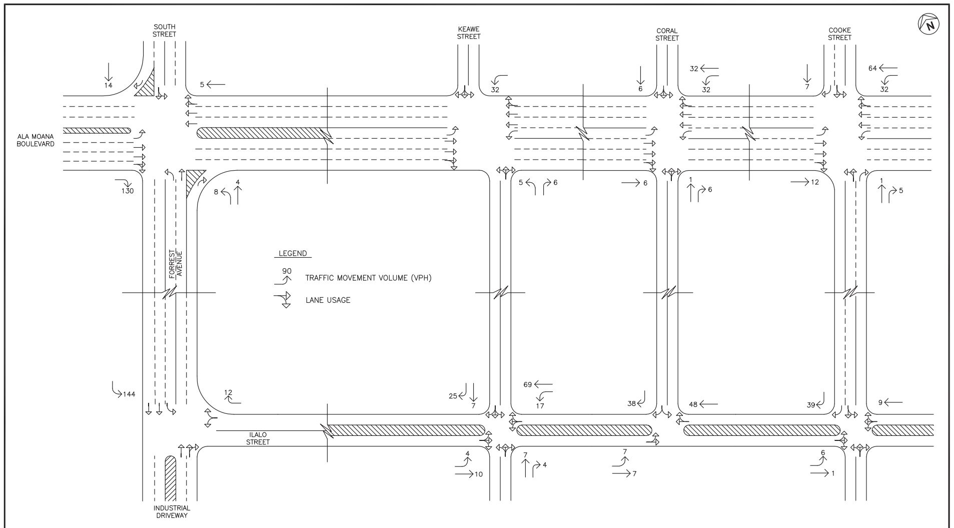


WILSON OKAMOTO CORPORATION

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

PROJECTED YEAR 2018 DISTRIBUTION OF SITE-GENERATED VEHICLES
PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 6

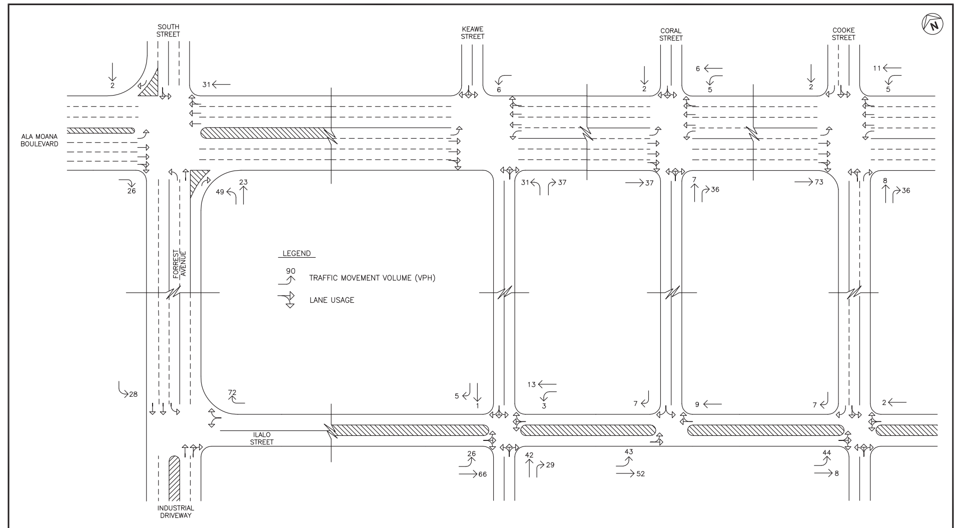


WILSON OKAMOTO CORPORATION

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

PROJECTED YEAR 2020 DISTRIBUTION OF SITE-GENERATED VEHICLES (FROM YEAR 2018)
AM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 7



WILSON OKAMOTO CORPORATION

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

PROJECTED YEAR 2020 DISTRIBUTION OF SITE-GENERATED VEHICLES (FROM YEAR 2018)
PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 8

C. Other Considerations

There is an open lot in the project vicinity located north of Ilalo Street between Keawe Street and Coral Street that is currently being used for parking. This lot is expected to be developed in the future and include the construction of a multi-story building. However, the development plans and implementation schedule for this lot are not known at this time and, as such, are not incorporated into Year 2018 projected conditions.

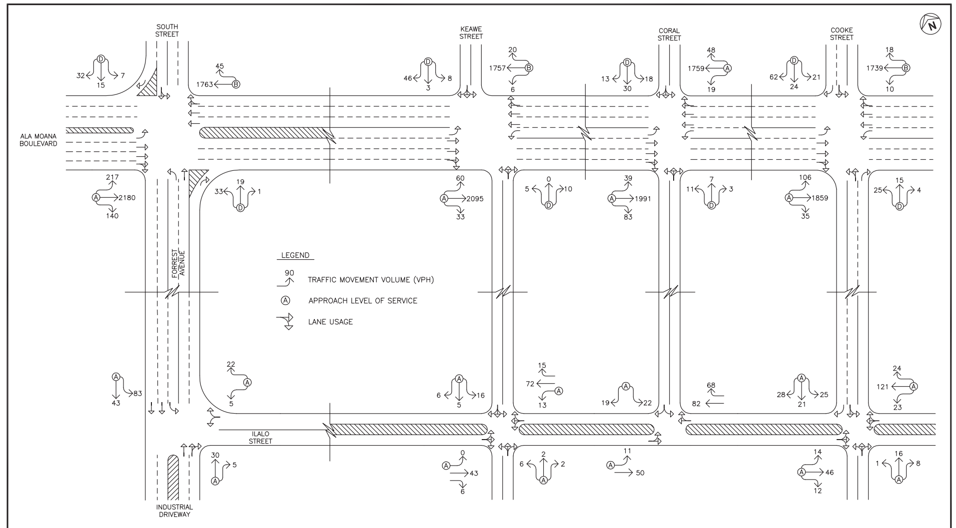
D. Year 2018 Total Traffic Volumes

1. Without Project

The projected Year 2018 AM and PM peak period traffic volumes and operating conditions without the development of the Kakaako Makai Innovation Block at Lot "C" are shown in Figures 9 and 10, 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 2018 (Without Project) LOS Traffic Operating Conditions

Intersection	Approach	AM		PM	
		Exist	Year 2018 w/out Proj	Exist	Year 2018 w/out Proj
Ala Moana Blvd/ South St/ Forrest Ave	Eastbound	A	A	A	A
	Westbound	B	B	B	B
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ala Moana Blvd/ Keawe St	Eastbound	A	A	B	B
	Westbound	B	B	B	B
	Northbound	D	D	D	E
	Southbound	D	D	D	E
Ala Moana Blvd/ Coral St	Eastbound	A	A	A	A
	Westbound	A	A	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D

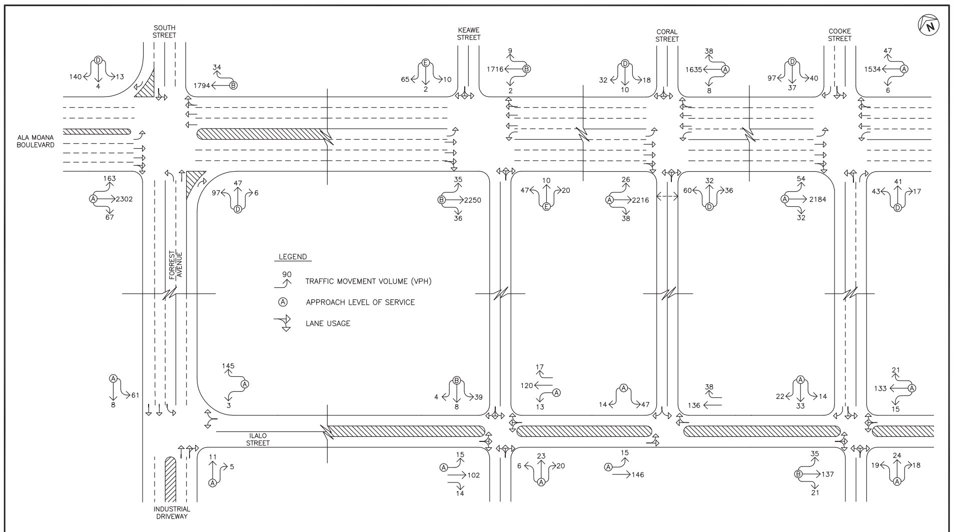


WILSON OKAMOTO CORPORATION

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

YEAR 2018 AM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE 9



KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

YEAR 2018 PM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE 10

Table 3: Existing and Projected Year 2018 (Without Project) LOS Traffic Operating Conditions (Cont'd)

Intersection	Approach	AM		PM	
		Exist	Year 2018 w/out Proj	Exist	Year 2018 w/out Proj
Ala Moana Blvd/ Cooke St	Eastbound	A	A	A	A
	Westbound	B	B	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ilalo St/ Forrest Ave	Westbound	A	A	A	A
	Northbound	A	A	A	A
	Southbound	A	A	A	A
Ilalo St/ Keawe St	Eastbound (LT)	A	A	A	A
	Westbound (LT)	A	A	A	A
	Northbound	A	A	A	A
	Southbound	A	A	B	B
Ilalo St/ Coral St	Eastbound (LT)	A	A	A	A
	Southbound	A	A	A	A
Ilalo St/ Cooke St	Eastbound	A	A	A	B
	Westbound	A	A	A	A
	Northbound	A	A	A	A
	Southbound	A	A	A	A

*LT = Left-Turn

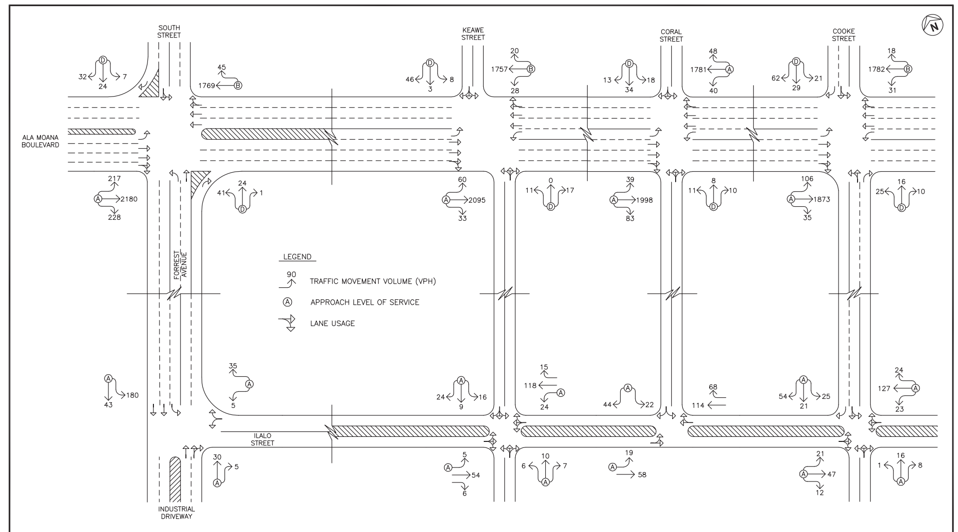
Under Year 2018 without project conditions, traffic operations are expected to deteriorate slightly from existing conditions due to the anticipated growth in ambient traffic along the surrounding roadways. Along Ala Moana Boulevard, traffic operations at the study intersections are expected to operate at LOS "D" or better during both peak periods with the exception of the intersection with Keawe Street. At the intersection with Keawe Street, both approaches of Ala Moana Boulevard are expected to operate at LOS "B" or better during both peak periods, while the Keawe Street approaches are expected to operate at LOS "D" and LOS "E" during the AM and PM peak periods, respectively. Along Ilalo Street, traffic operations at the study intersections are expected to operate at LOS "B" or better during both peak periods.

2. With Project

The Year 2018 cumulative AM and PM peak hour traffic conditions resulting from the projected external traffic and the completion of Phases 1A and 1B of the Kakaako Makai Innovation Block at Lot "C" development are shown on Figures 11 and 12 and summarized in Table 4. The cumulative volumes consist of site-generated traffic superimposed over Year 2018 projected traffic demands. The projected Year 2018 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix E.

Table 4: Projected Year 2018 (Without and With Project) LOS Traffic Operating Conditions

Intersection	Approach	AM		PM	
		Year 2018 w/out Proj	Year 2018 w/ Proj	Year 2018 w/out Proj	Year 2018 w/ Proj
Ala Moana Blvd/ South St/ Forrest Ave	Eastbound	A	A	A	B
	Westbound	B	B	B	B
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ala Moana Blvd/ Keawe St	Eastbound	A	A	B	B
	Westbound	B	B	B	B
	Northbound	D	D	E	E
	Southbound	D	D	E	E
Ala Moana Blvd/ Coral St	Eastbound	A	A	A	B
	Westbound	A	A	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ala Moana Blvd/ Cooke St	Eastbound	A	A	A	A
	Westbound	B	B	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D

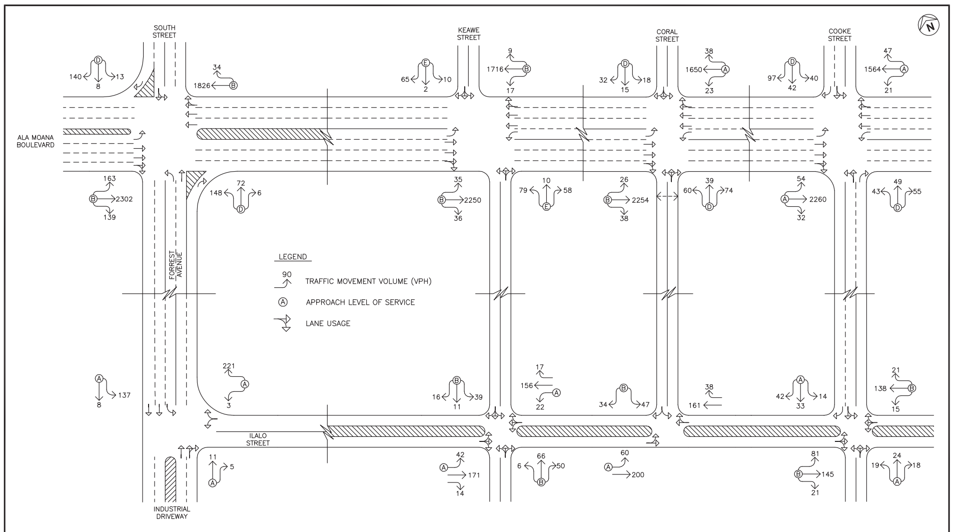


WILSON OKAMOTO CORPORATION

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

YEAR 2018 AM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 11



WILSON OKAMOTO CORPORATION

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

YEAR 2018 PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 12

Table 4: Projected Year 2018 (Without and With Project) LOS Traffic Operating Conditions (Cont'd)

Intersection	Approach	AM		PM	
		Year 2018 w/out Proj	Year 2018 w/ Proj	Year 2018 w/out Proj	Year 2018 w/ Proj
Ilalo St/ Forrest Ave	Westbound	A	A	A	A
	Northbound	A	A	A	A
	Southbound	A	A	A	A
Ilalo St/ Keawe St	Eastbound (LT)	A	A	A	A
	Westbound (LT)	A	A	A	A
	Northbound	A	A	A	B
	Southbound	A	A	B	B
Ilalo St/ Coral St	Eastbound (LT)	A	A	A	A
	Southbound	A	A	A	B
Ilalo St/ Cooke St	Eastbound	A	A	B	B
	Westbound	A	A	A	B
	Northbound	A	A	A	A
	Southbound	A	A	A	A

*LT = Left-Turn

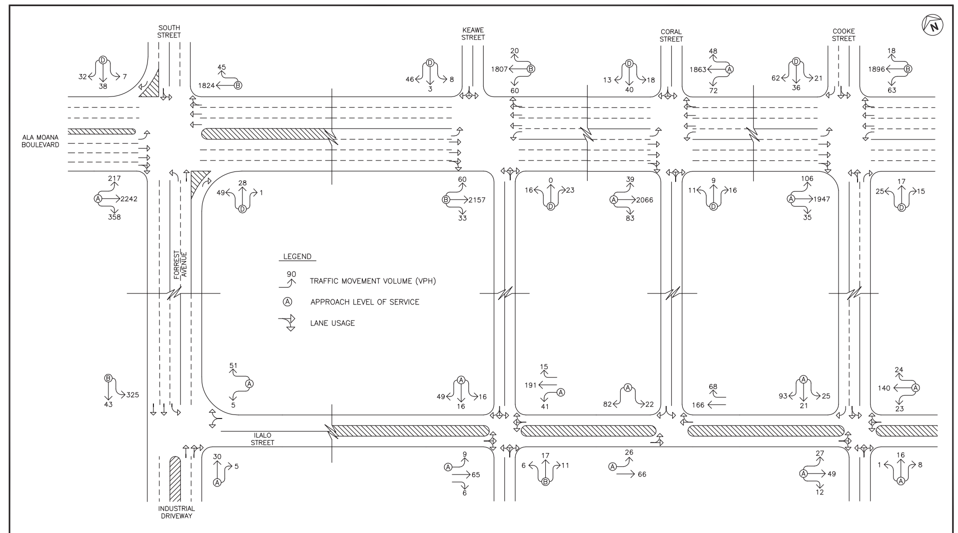
Under Year 2018 with project conditions, traffic operations are expected to remain similar to without project conditions despite the addition of site-generated vehicles to the surrounding roadways. Along Ala Moana Boulevard, traffic operations at the study intersections are expected to continue operating at LOS "D" or better during both peak periods with the exception of the intersection with Keawe Street. At the intersection with Keawe Street, the Ala Moana Boulevard approaches are expected to continue operating at LOS "B" or better during both peak periods while the Keawe Street approaches are expected to continue operating at LOS "D" and LOS "E" during the AM and PM peak periods, respectively. The remaining study intersections along Ilalo Street are expected to continue operating at LOS "B" or better during both peak periods.

E. Year 2020 Total Traffic Volumes

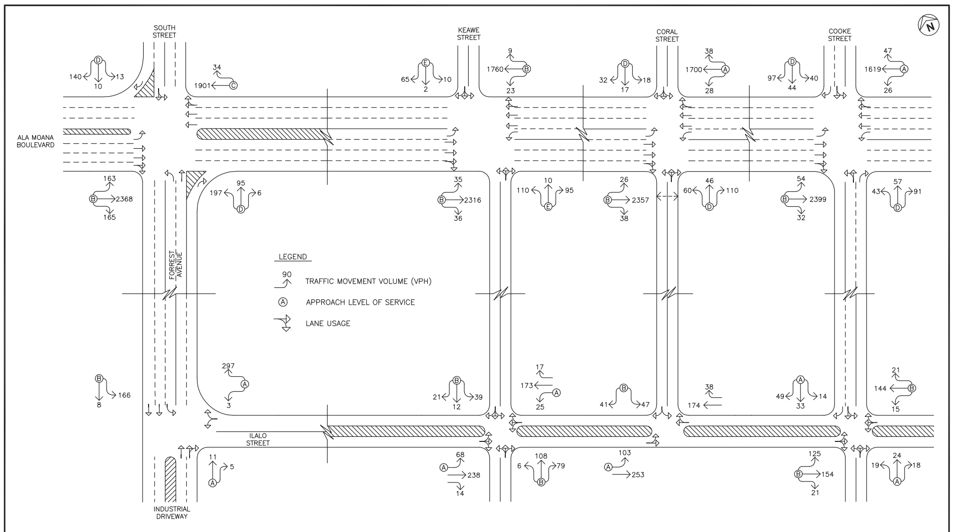
The projected Year 2020 peak hour traffic conditions with completion of all phases of the Kakaako Makai Innovation Block at Lot "C" development are shown in Figures 13 and 14, and summarized in Table 5. The cumulative volumes consist of site-generated traffic superimposed over Year 2020 projected traffic demands. The projected Year 2018 (With Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix F.

Table 5: Projected Year 2018 and Year 2020 With Project LOS Traffic Operating Conditions

Intersection	Approach	AM		PM	
		Year 2018 w/ Proj	Year 2020 w/ Proj	Year 2018 w/ Proj	Year 2020 w/ Proj
Ala Moana Blvd/ South St/ Forrest Ave	Eastbound	A	A	B	B
	Westbound	B	B	B	C
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ala Moana Blvd/ Keawe St	Eastbound	A	B	B	B
	Westbound	B	B	B	B
	Northbound	D	D	E	E
	Southbound	D	D	E	E
Ala Moana Blvd/ Coral St	Eastbound	A	A	B	B
	Westbound	A	A	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ala Moana Blvd/ Cooke St	Eastbound	A	A	A	B
	Westbound	B	B	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ilalo St/ Forrest Ave	Westbound	A	A	A	A
	Northbound	A	A	A	A
	Southbound	A	B	A	B



KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"
YEAR 2020 AM PEAK HOUR OF TRAFFIC WITH PROJECT
FIGURE 13



KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C"

YEAR 2020 PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 14

Table 5: Projected Year 2018 and Year 2020 With Project LOS Traffic Operating Conditions (Cont'd)

Intersection	Approach	AM		PM	
		Year 2018 w/ Proj	Year 2020 w/ Proj	Year 2018 w/ Proj	Year 2020 w/ Proj
Ilalo St/ Keawe St	Eastbound (LT)	A	A	A	A
	Westbound (LT)	A	A	A	A
	Northbound	A	B	B	B
	Southbound	A	A	B	B
Ilalo St/ Coral St	Eastbound (LT)	A	A	A	A
	Southbound	A	A	B	B
Ilalo St/ Cooke St	Eastbound	A	A	B	B
	Westbound	A	A	B	B
	Northbound	A	A	A	A
	Southbound	A	A	A	A

*LT = Left-Turn

Under Year 2020 with project conditions, traffic operations in the vicinity are generally expected to remain similar to Year 2018 with project conditions despite the addition of site-generated vehicles to the surrounding roadways. At the intersection with South Street and Forrest Avenue, the eastbound approach of Ala Moana Boulevard is expected to continue operating at LOS "B" or better during both peak periods while the westbound approach is expected to operate at LOS "B" and LOS "C" during the AM and PM peak periods, respectively. The approaches of the remaining study intersections along Ala Moana Boulevard are expected to continue operating at LOS "D" or better during both peak periods except at the intersection with Keawe Street which is expected to continue operating at LOS "D" or better during the AM peak period and LOS "E" or better during PM peak period. Along Ilalo Street, traffic operations at the study intersections are expected to operate at LOS "B" or better during both peak periods.

V. LEFT-TURN STORAGE LANE WARRANT

The project driveway off Ilalo Street is expected to serve as the primary access for the Kakaako Makai Innovation Block at Lot "C" development with turning traffic at the intersection with that driveway expected to increase significantly. As such, the intersection of Ilalo Street with the project driveway was assessed to determine if a left-turn lane was warranted for westbound traffic along Ilalo Street. The methodology used as the basis of this assessment is outlined in "Volume Warrants for Left-Turn Storage Lanes at Unsignalized Grade Intersections" by M.D. Harmelink. Utilizing the aforementioned methodology and the Year 2020 projected traffic volumes, a left-turn storage lane for westbound traffic along Ilalo Street is not warranted during the AM and PM peak periods.

V1. RECOMMENDATIONS

Based on the analysis of the traffic data, the following are the recommendations assumed to be completed prior to Phase 1 of the Kakaako Makai Innovation Block at Lot "C" development:

1. Maintain sufficient sight distance for motorists to safely enter and exit the project driveways.
2. Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.
3. Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto public roadways.
4. Provide sufficient turning radii at all project driveways to avoid or minimize vehicle encroachments to oncoming traffic lanes.
5. Provide appropriate signage to direct pedestrians to the provided walkways and other pedestrian facilities in the project vicinity.
6. Consider providing adequate and secure bicycle facilities including bike racks, bike lockers, and designated bicycle parking areas to encourage the use of alternate modes of travel.
7. Consider locating the proposed project driveway along Ilalo Street further east (as much as feasible) to maximize the spacing and sight distance between that driveway and the driveways near the intersection with Forrest Avenue, and minimize turning movement conflicts. In addition, the proximity of the proposed project driveway to the intersection with Keawe Street to the west should be considered.

VII. CONCLUSION

The project site for the proposed Kakaako Makai Innovation Block at Lot "C" development currently houses an at-grade parking lot which is expected to be redeveloped in four phases over the next five years. The final development is expected to primarily consist of four buildings with a mix of commercial and office space and a new parking structure. With the implementation of the aforementioned recommendations, traffic operations at the study intersections are expected to continue operating at levels of service similar to without project conditions. The selection of an appropriate driveway location along Ilalo Street and the provision of adequate sight distance, turning radii, and on-site loading areas are expected to minimize the impact of the development on the adjacent roadways. As such, the proposed Kakaako Makai Innovation Block at Lot "C" development is not expected to have a significant impact on traffic operations in the vicinity.

APPENDIX A

EXISTING TRAFFIC COUNT DATA

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:RF, PA
Counters:TU-0654, TU-0649
Weather:Clear

File Name : AlaCoo AM
Site Code : 00000004
Start Date : 5/12/2015
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Ala Moana Boulevard Westbound					Cooke Street Northbound					Ala Moana Boulevard 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	3	8	5	19	0	168	3	3	174	2	3	0	5	10	17	290	11	4	322	525
06:15 AM	0	3	6	2	11	1	216	8	2	227	3	3	1	3	10	34	276	14	2	326	574
06:30 AM	3	3	12	5	23	1	281	10	2	294	3	2	0	3	8	18	369	6	3	396	721
06:45 AM	3	4	15	6	28	1	318	11	3	333	4	3	3	8	18	26	395	7	2	430	809
Total	9	13	41	18	81	3	983	32	10	1028	12	11	4	19	46	95	1330	38	11	1474	2629
07:00 AM	1	6	9	5	21	0	347	15	3	365	12	5	1	2	20	19	394	6	1	420	826
07:15 AM	3	3	7	2	15	2	424	6	1	433	5	4	1	6	16	25	433	10	1	469	933
07:30 AM	3	9	12	3	27	0	434	4	3	441	7	1	3	5	16	24	446	11	4	485	969
07:45 AM	9	6	27	4	46	3	398	5	4	410	7	5	0	3	15	24	458	10	1	493	964
Total	16	24	55	14	109	5	1603	30	11	1649	31	15	5	16	67	92	1731	37	7	1867	3692
08:00 AM	6	6	16	1	29	5	408	3	1	417	6	5	0	2	13	33	428	4	3	468	927
08:15 AM	5	11	21	5	42	2	390	5	0	397	5	2	4	4	15	23	333	9	5	370	824
08:30 AM	3	5	14	1	23	6	317	16	6	345	5	8	2	3	18	19	379	15	2	415	801
08:45 AM	8	8	14	2	32	7	282	9	2	300	9	9	4	2	24	12	291	14	0	317	673
Total	22	30	65	9	126	20	1397	33	9	1459	25	24	10	11	70	87	1431	42	10	1570	3225
Grand Total	47	67	161	41	316	28	3983	95	30	4136	68	50	19	46	183	274	4492	117	28	4911	9546
Apprch %	14.9	21.2	50.9	13		0.7	96.3	2.3	0.7		37.2	27.3	10.4	25.1		5.6	91.5	2.4	0.6		
Total %	0.5	0.7	1.7	0.4	3.3	0.3	41.7	1	0.3	43.3	0.7	0.5	0.2	0.5	1.9	2.9	47.1	1.2	0.3	51.4	

	Cooke Street Southbound				Ala Moana Boulevard Westbound				Cooke Street Northbound				Ala Moana Boulevard 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	3	3	7	13	2	424	**6**	432	5	4	1	10	25	433	10	468	923
07:30 AM	3	**9**	12	24	0	**434**	4	**438**	**7**	1	**3**	11	24	446	**11**	481	**954**
07:45 AM	**9**	6	**27**	**42**	3	398	5	406	7	**5**	0	**12**	24	**458**	10	**492**	952
08:00 AM	6	6	16	28	**5**	408	3	416	6	5	0	11	**33**	428	4	465	920
Total Volume	21	24	62	107	10	1664	18	1692	25	15	4	44	106	1765	35	1906	3749
% App. Total	19.6	22.4	57.9		0.6	98.3	1.1		56.8	34.1	9.1		5.6	92.6	1.8		
PHF	.583	.667	.574	.637	.500	.959	.750	.966	.893	.750	.333	.917	.803	.963	.795	.968	.982

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:RF, PA
Counters:TU-0651, TU-0653
Weather:Clear

File Name : AlaCoo PM
Site Code : 00000004
Start Date : 5/12/2015
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Ala Moana Boulevard Westbound					Cooke Street Northbound					Ala Moana Boulevard 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	8	32	4	52	1	355	10	2	368	11	8	3	5	27	18	398	6	0	422	869
03:15 PM	11	6	13	4	34	3	360	9	1	373	15	7	2	5	29	9	435	8	1	453	889
03:30 PM	9	7	28	3	47	0	415	7	1	423	10	6	3	0	19	18	443	7	0	468	957
03:45 PM	10	6	29	4	49	0	384	11	2	397	15	8	4	1	28	10	500	3	1	514	988
Total	38	27	102	15	182	4	1514	37	6	1561	51	29	12	11	103	55	1776	24	2	1857	3703
04:00 PM	13	7	28	2	50	2	344	14	2	362	19	12	2	6	39	15	496	9	9	529	980
04:15 PM	7	5	28	2	42	3	377	7	1	388	7	9	2	6	24	15	562	5	3	585	1039
04:30 PM	7	13	24	5	49	0	356	13	2	371	13	14	4	1	32	9	503	13	4	529	981
04:45 PM	16	6	20	9	51	1	375	14	1	391	11	8	7	6	32	14	537	10	3	564	1038
Total	43	31	100	18	192	6	1452	48	6	1512	50	43	15	19	127	53	2098	37	19	2207	4038
05:00 PM	10	13	25	5	53	2	360	13	3	378	12	10	4	13	39	16	483	4	8	511	981
05:15 PM	14	11	28	7	60	2	372	7	7	388	5	8	3	5	21	11	462	5	8	486	955
05:30 PM	7	4	22	5	38	5	356	14	0	375	7	6	2	4	19	10	521	4	7	542	974
05:45 PM	12	7	17	8	44	1	337	13	1	352	20	10	2	7	39	7	472	6	11	496	931
Total	43	35	92	25	195	10	1425	47	11	1493	44	34	11	29	118	44	1938	19	34	2035	3841
Grand Total	124	93	294	58	569	20	4391	132	23	4566	145	106	38	59	348	152	5812	80	55	6099	11582
Apprch %	21.8	16.3	51.7	10.2		0.4	96.2	2.9	0.5		41.7	30.5	10.9	17		2.5	95.3	1.3	0.9		
Total %	1.1	0.8	2.5	0.5	4.9	0.2	37.9	1.1	0.2	39.4	1.3	0.9	0.3	0.5	3	1.3	50.2	0.7	0.5	52.7	

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:00 PM

	Cooke Street Southbound				Ala Moana Boulevard Westbound				Cooke Street Northbound				Ala Moana Boulevard 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
04:00 PM	13	7	**28**	**48**	2	344	**14**	360	**19**	12	2	**33**	**15**	496	9	520	961
04:15 PM	7	5	28	40	**3**	**377**	7	387	7	9	2	18	15	**562**	5	**582**	**1027**
04:30 PM	7	**13**	24	44	0	356	13	369	13	**14**	4	31	9	503	**13**	525	969
04:45 PM	**16**	6	20	42	1	375	14	**390**	11	8	**7**	26	14	537	10	561	1019
Total Volume	43	31	100	174	6	1452	48	1506	50	43	15	108	53	2098	37	2188	3976
% App. Total	24.7	17.8	57.5		0.4	96.4	3.2		46.3	39.8	13.9		2.4	95.9	1.7		
PHF	.672	.596	.893	.906	.500	.963	.857	.965	.658	.768	.536	.818	.883	.933	.712	.940	.968

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:GC, BC
Counters:D4-5671, D4-5672
Weather:Clear

File Name : AlaCor AM
Site Code : 00000000
Start Date : 5/12/2015
Page No : 1

Groups Printed- Unshifted

	Coral Street Southbound					Ala Moana Boulevard Westbound					Coral Street Northbound					Ala Moana Boulevard 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	1	2	3	6	1	163	7	0	171	0	1	0	3	4	6	321	16	5	348	529
06:15 AM	2	5	3	1	11	3	211	6	0	220	2	0	2	7	11	4	323	7	10	344	586
06:30 AM	2	3	2	2	9	1	287	8	0	296	1	0	0	6	7	4	394	13	5	416	728
06:45 AM	4	3	2	5	14	2	320	13	2	337	0	2	3	13	18	8	418	16	6	448	817
Total	8	12	9	11	40	7	981	34	2	1024	3	3	5	29	40	22	1456	52	26	1556	2660
07:00 AM	2	5	2	5	14	4	355	7	0	366	3	1	3	3	10	6	417	22	15	460	850
07:15 AM	6	8	2	1	17	2	427	8	2	439	4	1	1	7	13	8	464	15	9	496	965
07:30 AM	4	10	4	6	24	3	435	11	7	456	2	0	0	11	13	9	478	18	17	522	1015
07:45 AM	4	4	3	6	17	11	422	10	2	445	3	3	1	9	16	11	489	16	11	527	1005
Total	16	27	11	18	72	20	1639	36	11	1706	12	5	5	30	52	34	1848	71	52	2005	3835
08:00 AM	4	8	4	2	18	3	400	19	3	425	2	3	1	3	9	11	467	34	13	525	977
08:15 AM	6	8	4	8	26	14	386	14	2	416	7	5	2	3	17	12	359	26	10	407	866
08:30 AM	3	3	7	5	18	7	313	10	3	333	3	2	6	5	16	8	410	20	12	450	817
08:45 AM	3	8	12	7	30	8	285	9	0	302	4	7	8	3	22	14	314	17	2	347	701
Total	16	27	27	22	92	32	1384	52	8	1476	16	17	17	14	64	45	1550	97	37	1729	3361
Grand Total	40	66	47	51	204	59	4004	122	21	4206	31	25	27	73	156	101	4854	220	115	5290	9856
Apprch %	19.6	32.4	23	25		1.4	95.2	2.9	0.5		19.9	16	17.3	46.8		1.9	91.8	4.2	2.2		
Total %	0.4	0.7	0.5	0.5	2.1	0.6	40.6	1.2	0.2	42.7	0.3	0.3	0.3	0.7	1.6	1	49.2	2.2	1.2	53.7	

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

	Coral Street Southbound				Ala Moana Boulevard Westbound				Coral Street Northbound				Ala Moana Boulevard 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
07:15 AM	**6**	8	2	16	2	427	8	437	**4**	1	**1**	6	8	464	15	487	946
07:30 AM	4	**10**	**4**	**18**	3	**435**	11	**449**	2	0	0	2	9	478	18	505	974
07:45 AM	4	4	3	11	**11**	422	10	443	3	**3**	1	**7**	**11**	**489**	16	**516**	**977**
08:00 AM	4	8	4	16	3	400	**19**	422	2	3	1	6	11	467	**34**	512	956
Total Volume	18	30	13	61	19	1684	48	1751	11	7	3	21	39	1898	83	2020	3853
% App. Total	29.5	49.2	21.3		1.1	96.2	2.7		52.4	33.3	14.3		1.9	94	4.1		
PHF	.750	.750	.813	.847	.432	.968	.632	.975	.688	.583	.750	.750	.886	.970	.610	.979	.986

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:GC, BC
Counters:D4-5671, D4-5672
Weather:Clear

File Name : AlaCor PM
Site Code : 00000000
Start Date : 5/12/2015
Page No : 1

Groups Printed- Unshifted

	Coral Street Southbound					Ala Moana Boulevard Westbound					Coral Street Northbound					Ala Moana Boulevard 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	5	2	16	2	25	6	396	10	0	412	18	5	5	5	33	7	412	7	5	431	901
03:15 PM	8	1	10	5	24	3	373	6	0	382	9	7	6	4	26	11	436	7	4	458	890
03:30 PM	1	1	11	1	14	3	437	11	0	451	15	4	4	2	25	3	467	5	1	476	966
03:45 PM	5	5	7	3	20	3	424	10	0	437	12	6	5	4	27	6	504	8	7	525	1009
Total	19	9	44	11	83	15	1630	37	0	1682	54	22	20	15	111	27	1819	27	17	1890	3766
04:00 PM	3	2	3	4	12	0	365	11	2	378	22	6	9	2	39	9	505	3	11	528	957
04:15 PM	3	2	6	3	14	3	410	8	2	423	4	9	3	6	22	9	581	8	15	613	1072
04:30 PM	8	2	7	8	25	1	381	12	1	395	17	8	12	9	46	4	505	12	19	540	1006
04:45 PM	3	4	6	9	22	3	399	6	3	411	17	8	7	8	40	6	552	7	8	573	1046
Total	17	10	22	24	73	7	1555	37	8	1607	60	31	31	25	147	28	2143	30	53	2254	4081
05:00 PM	4	2	13	6	25	1	393	12	0	406	22	7	14	8	51	7	486	11	6	510	992
05:15 PM	1	5	6	4	16	1	391	10	2	404	14	10	9	7	40	5	471	6	7	489	949
05:30 PM	8	3	10	4	25	0	373	8	0	381	11	2	3	6	22	9	526	7	5	547	975
05:45 PM	4	6	9	11	30	1	379	6	0	386	4	9	2	7	22	7	483	5	2	497	935
Total	17	16	38	25	96	3	1536	36	2	1577	51	28	28	28	135	28	1966	29	20	2043	3851
Grand Total	53	35	104	60	252	25	4721	110	10	4866	165	81	79	68	393	83	5928	86	90	6187	11698
Apprch %	21	13.9	41.3	23.8		0.5	97	2.3	0.2		42	20.6	20.1	17.3		1.3	95.8	1.4	1.5		
Total %	0.5	0.3	0.9	0.5	2.2	0.2	40.4	0.9	0.1	41.6	1.4	0.7	0.7	0.6	3.4	0.7	50.7	0.7	0.8	52.9	

	Coral Street Southbound				Ala Moana Boulevard Westbound				Coral Street Northbound				Ala Moana Boulevard 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 04:15 PM																	
04:15 PM	3	2	6	11	**3**	**410**	8	**421**	4	**9**	3	16	**9**	**581**	8	**598**	**1046**
04:30 PM	**8**	2	7	17	1	381	**12**	394	17	8	12	37	4	505	**12**	521	969
04:45 PM	3	**4**	6	13	3	399	6	408	17	8	7	32	6	552	7	565	1018
05:00 PM	4	2	**13**	**19**	1	393	12	406	**22**	7	**14**	**43**	7	486	11	504	972
Total Volume	18	10	32	60	8	1583	38	1629	60	32	36	128	26	2124	38	2188	4005
% App. Total	30	16.7	53.3		0.5	97.2	2.3		46.9	25	28.1		1.2	97.1	1.7		
PHF	.563	.625	.615	.789	.667	.965	.792	.967	.682	.889	.643	.744	.722	.914	.792	.915	.957

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:FS, MA
Counters:D4-5674, D4-5676
Weather:Clear

File Name : AlaKea AM
Site Code : 00000002
Start Date : 5/12/2015
Page No : 1

Groups Printed- Unshifted

	Keawe Street Southbound					Ala Moana Boulevard Westbound					Keawe Street Northbound					Ala Moana Boulevard 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	0	1	1	2	1	167	1	2	171	2	0	3	9	14	9	339	9	3	360	547
06:15 AM	1	0	3	2	6	0	213	2	6	221	3	0	2	5	10	9	326	7	3	345	582
06:30 AM	2	1	7	4	14	1	283	3	4	291	0	0	0	7	7	8	413	2	4	427	739
06:45 AM	1	0	14	0	15	0	334	4	4	342	1	1	1	7	10	17	434	7	0	458	825
Total	4	1	25	7	37	2	997	10	16	1025	6	1	6	28	41	43	1512	25	10	1590	2693
07:00 AM	1	1	7	1	10	2	348	3	3	356	0	1	1	6	8	13	437	6	1	457	831
07:15 AM	1	1	10	2	14	0	417	5	4	426	1	0	1	5	7	7	486	10	2	505	952
07:30 AM	2	0	16	3	21	3	420	4	5	432	1	0	3	6	10	14	495	7	3	519	982
07:45 AM	4	1	8	11	24	2	449	5	5	461	1	0	4	5	10	21	508	8	10	547	1042
Total	8	3	41	17	69	7	1634	17	17	1675	3	1	9	22	35	55	1926	31	16	2028	3807
08:00 AM	1	1	12	5	19	1	396	6	1	404	2	0	2	5	9	18	512	8	5	543	975
08:15 AM	5	2	9	12	28	0	403	4	8	415	5	2	3	2	12	8	386	7	13	414	869
08:30 AM	1	2	11	2	16	2	314	1	8	325	2	1	5	6	14	8	428	8	2	446	801
08:45 AM	5	1	15	12	33	0	300	3	6	309	9	0	3	1	13	4	340	10	12	366	721
Total	12	6	47	31	96	3	1413	14	23	1453	18	3	13	14	48	38	1666	33	32	1769	3366
Grand Total	24	10	113	55	202	12	4044	41	56	4153	27	5	28	64	124	136	5104	89	58	5387	9866
Apprch %	11.9	5	55.9	27.2		0.3	97.4	1	1.3		21.8	4	22.6	51.6		2.5	94.7	1.7	1.1		
Total %	0.2	0.1	1.1	0.6	2	0.1	41	0.4	0.6	42.1	0.3	0.1	0.3	0.6	1.3	1.4	51.7	0.9	0.6	54.6	

	Keawe Street Southbound				Ala Moana Boulevard Westbound				Keawe Street Northbound				Ala Moana Boulevard 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	1	**1**	10	12	0	417	5	422	1	0	1	2	7	486	**10**	503	939
07:30 AM	2	0	**16**	**18**	**3**	420	4	427	1	0	3	4	14	495	7	516	965
07:45 AM	**4**	1	8	13	2	**449**	5	**456**	1	0	**4**	**5**	**21**	508	8	537	**1011**
08:00 AM	1	1	12	14	1	396	**6**	403	**2**	0	2	4	18	**512**	8	**538**	959
Total Volume	8	3	46	57	6	1682	20	1708	5	0	10	15	60	2001	33	2094	3874
% App. Total	14	5.3	80.7		0.4	98.5	1.2		33.3	0	66.7		2.9	95.6	1.6		
PHF	.500	.750	.719	.792	.500	.937	.833	.936	.625	.000	.625	.750	.714	.977	.825	.973	.958

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:KC, FS
Counters:D4-5676, D4-5677
Weather:Clear

File Name : AlaKea PM
Site Code : 00000002
Start Date : 5/12/2015
Page No : 1

Groups Printed- Unshifted

	Keawe Street Southbound					Ala Moana Boulevard Westbound					Keawe Street Northbound					Ala Moana Boulevard 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	0	9	1	13	2	420	6	1	429	17	1	0	5	23	6	426	9	1	442	907
03:15 PM	5	2	12	0	19	1	387	2	0	390	11	0	2	7	20	7	452	7	2	468	897
03:30 PM	4	1	25	1	31	1	460	0	6	467	9	1	3	4	17	5	470	8	11	494	1009
03:45 PM	5	0	8	0	13	1	445	1	0	447	8	1	2	5	16	3	527	4	4	538	1014
Total	17	3	54	2	76	5	1712	9	7	1733	45	3	7	21	76	21	1875	28	18	1942	3827
04:00 PM	9	0	19	0	28	0	389	1	0	390	15	2	4	6	27	7	504	5	1	517	962
04:15 PM	4	1	14	3	22	1	414	6	0	421	14	2	6	7	29	9	578	5	2	594	1066
04:30 PM	4	0	18	1	23	0	400	1	0	401	12	2	4	8	26	10	517	11	4	542	992
04:45 PM	0	0	23	0	23	1	416	0	0	417	11	4	4	5	24	11	562	6	1	580	1044
Total	17	1	74	4	96	2	1619	8	0	1629	52	10	18	26	106	37	2161	27	8	2233	4064
05:00 PM	2	1	10	0	13	0	420	2	0	422	10	2	6	16	34	5	494	14	3	516	985
05:15 PM	3	2	10	0	15	0	407	1	0	408	5	4	3	8	20	14	478	14	3	509	952
05:30 PM	8	1	5	1	15	0	389	2	0	391	5	1	1	5	12	10	528	10	6	554	972
05:45 PM	2	0	8	1	11	2	386	1	1	390	7	1	0	7	15	6	489	8	4	507	923
Total	15	4	33	2	54	2	1602	6	1	1611	27	8	10	36	81	35	1989	46	16	2086	3832
Grand Total	49	8	161	8	226	9	4933	23	8	4973	124	21	35	83	263	93	6025	101	42	6261	11723
Apprch %	21.7	3.5	71.2	3.5		0.2	99.2	0.5	0.2		47.1	8	13.3	31.6		1.5	96.2	1.6	0.7		
Total %	0.4	0.1	1.4	0.1	1.9	0.1	42.1	0.2	0.1	42.4	1.1	0.2	0.3	0.7	2.2	0.8	51.4	0.9	0.4	53.4	

	Keawe Street Southbound				Ala Moana Boulevard Westbound				Keawe Street Northbound				Ala Moana Boulevard 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 04:15 PM																	
04:15 PM	**4**	**1**	14	19	**1**	414	**6**	421	**14**	2	**6**	**22**	9	**578**	5	**592**	**1054**
04:30 PM	4	0	18	22	0	400	1	401	12	2	4	18	10	517	11	538	979
04:45 PM	0	0	**23**	**23**	1	416	0	417	11	**4**	4	19	**11**	562	6	579	1038
05:00 PM	2	1	10	13	0	**420**	2	**422**	10	2	6	18	5	494	**14**	513	966
Total Volume	10	2	65	77	2	1650	9	1661	47	10	20	77	35	2151	36	2222	4037
% App. Total	13	2.6	84.4		0.1	99.3	0.5		61	13	26		1.6	96.8	1.6		
PHF	.625	.500	.707	.837	.500	.982	.375	.984	.839	.625	.833	.875	.795	.930	.643	.938	.958

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:DM, AC
Counters:D4-5674, D4-3888
Weather:Clear

File Name : AlaSouFor AM
Site Code : 00000001
Start Date : 5/12/2015
Page No : 1

Groups Printed- Unshifted

	South Street Southbound					Ala Moana Boulevard Westbound					Forrest Avenue Northbound					Ala Moana Boulevard 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	1	2	7	1	11	0	156	8	0	164	0	0	0	0	0	27	355	8	3	393	568
06:15 AM	1	2	0	3	6	0	216	5	0	221	1	0	2	7	10	37	346	21	3	407	644
06:30 AM	1	4	3	4	12	0	274	20	0	294	4	1	0	5	10	36	423	17	9	485	801
06:45 AM	1	4	8	4	17	0	343	11	0	354	4	0	0	9	13	38	457	17	11	523	907
Total	4	12	18	12	46	0	989	44	0	1033	9	1	2	21	33	138	1581	63	26	1808	2920
07:00 AM	2	3	5	1	11	0	341	15	0	356	1	4	1	4	10	29	451	39	9	528	905
07:15 AM	0	6	8	1	15	0	411	13	0	424	7	6	0	3	16	47	499	39	11	596	1051
07:30 AM	1	6	4	1	12	0	444	1	0	445	14	9	0	1	24	68	509	61	16	654	1135
07:45 AM	3	1	12	1	17	0	450	12	0	462	6	5	1	6	18	53	530	30	12	625	1122
Total	6	16	29	4	55	0	1646	41	0	1687	28	24	2	14	68	197	1989	169	48	2403	4213
08:00 AM	3	4	8	0	15	0	399	19	0	418	12	3	0	1	16	49	531	28	14	622	1071
08:15 AM	2	4	12	2	20	0	393	25	0	418	1	3	2	0	6	41	392	32	12	477	921
08:30 AM	4	2	14	2	22	0	314	13	0	327	14	7	0	3	24	37	425	37	3	502	875
08:45 AM	1	5	16	2	24	0	299	26	0	325	7	1	0	1	9	41	350	28	5	424	782
Total	10	15	50	6	81	0	1405	83	0	1488	34	14	2	5	55	168	1698	125	34	2025	3649
Grand Total	20	43	97	22	182	0	4040	168	0	4208	71	39	6	40	156	503	5268	357	108	6236	10782
Apprch %	11	23.6	53.3	12.1		0	96	4	0		45.5	25	3.8	25.6		8.1	84.5	5.7	1.7		
Total %	0.2	0.4	0.9	0.2	1.7	0	37.5	1.6	0	39	0.7	0.4	0.1	0.4	1.4	4.7	48.9	3.3	1	57.8	

	South Street Southbound				Ala Moana Boulevard Westbound				Forrest Avenue Northbound				Ala Moana Boulevard 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	0	**6**	8	14	0	411	13	424	7	6	0	13	47	499	39	585	1036
07:30 AM	1	6	4	11	0	444	1	445	**14**	**9**	0	**23**	**68**	509	**61**	**638**	**1117**
07:45 AM	**3**	1	**12**	**16**	0	**450**	12	**462**	6	5	**1**	12	53	530	30	613	1103
08:00 AM	3	4	8	15	0	399	**19**	418	12	3	0	15	49	**531**	28	608	1056
Total Volume	7	17	32	56	0	1704	45	1749	39	23	1	63	217	2069	158	2444	4312
% App. Total	12.5	30.4	57.1		0	97.4	2.6		61.9	36.5	1.6		8.9	84.7	6.5		
PHF	.583	.708	.667	.875	.000	.947	.592	.946	.696	.639	.250	.685	.798	.974	.648	.958	.965

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:AC, HI
Counters:D4-3888, D4-5674
Weather:Clear

File Name : AlaSouFor PM
Site Code : 00000001
Start Date : 5/12/2015
Page No : 1

Groups Printed- Unshifted

	South Street Southbound					Ala Moana Boulevard Westbound					Forrest Avenue Northbound					Ala Moana Boulevard 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	2	2	25	1	30	0	425	15	1	441	20	8	0	6	34	26	422	12	9	469	974
03:15 PM	6	0	32	3	41	0	400	9	0	409	16	10	1	5	32	21	461	19	4	505	987
03:30 PM	2	1	24	0	27	0	485	7	0	492	32	12	0	0	44	24	481	7	4	516	1079
03:45 PM	1	1	23	7	32	0	449	14	0	463	25	9	2	3	39	37	550	10	1	598	1132
Total	11	4	104	11	130	0	1759	45	1	1805	93	39	3	14	149	108	1914	48	18	2088	4172
04:00 PM	4	2	44	2	52	0	409	11	0	420	39	7	1	7	54	32	503	11	13	559	1085
04:15 PM	1	0	18	3	22	0	439	6	0	445	22	13	0	11	46	35	591	14	12	652	1165
04:30 PM	4	2	60	2	68	0	419	8	0	427	34	16	3	7	60	34	531	12	16	593	1148
04:45 PM	2	1	22	6	31	0	434	10	0	444	16	4	1	10	31	50	554	19	8	631	1137
Total	11	5	144	13	173	0	1701	35	0	1736	111	40	5	35	191	151	2179	56	49	2435	4535
05:00 PM	6	1	40	1	48	0	418	10	0	428	23	13	2	4	42	44	505	22	12	583	1101
05:15 PM	7	2	42	5	56	0	407	9	0	416	31	19	1	13	64	49	500	17	13	579	1115
05:30 PM	7	1	28	3	39	0	379	10	0	389	23	6	1	5	35	34	542	17	10	603	1066
05:45 PM	5	2	28	9	44	0	395	9	0	404	19	6	1	2	28	16	494	6	8	524	1000
Total	25	6	138	18	187	0	1599	38	0	1637	96	44	5	24	169	143	2041	62	43	2289	4282
Grand Total	47	15	386	42	490	0	5059	118	1	5178	300	123	13	73	509	402	6134	166	110	6812	12989
Apprch %	9.6	3.1	78.8	8.6		0	97.7	2.3	0		58.9	24.2	2.6	14.3		5.9	90	2.4	1.6		
Total %	0.4	0.1	3	0.3	3.8	0	38.9	0.9	0	39.9	2.3	0.9	0.1	0.6	3.9	3.1	47.2	1.3	0.8	52.4	

	South Street Southbound				Ala Moana Boulevard Westbound				Forrest Avenue Northbound				Ala Moana Boulevard 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 04:15 PM																	
04:15 PM	1	0	18	19	0	**439**	6	**445**	22	13	0	35	35	**591**	14	**640**	**1139**
04:30 PM	4	**2**	**60**	**66**	0	419	8	427	**34**	**16**	**3**	**53**	34	531	12	577	1123
04:45 PM	2	1	22	25	0	434	**10**	444	16	4	1	21	**50**	554	19	623	1113
05:00 PM	**6**	1	40	47	0	418	10	428	23	13	2	38	44	505	**22**	571	1084
Total Volume	13	4	140	157	0	1710	34	1744	95	46	6	147	163	2181	67	2411	4459
% App. Total	8.3	2.5	89.2		0	98.1	1.9		64.6	31.3	4.1		6.8	90.5	2.8		
PHF	.542	.500	.583	.595	.000	.974	.850	.980	.699	.719	.500	.693	.815	.923	.761	.942	.979

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:GC, MA
Counters:D4-5673, D4-5675
Weather:Clear

File Name : IlaCoo AM
Site Code : 00000002
Start Date : 5/13/2015
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Ilalo Street Westbound					Cooke Street Northbound					Ilalo 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	4	1	3	0	8	0	8	1	2	11	0	2	0	0	2	1	11	2	1	15	36
06:15 AM	2	8	4	1	15	3	7	2	1	13	1	2	2	0	5	0	12	3	2	17	50
06:30 AM	2	3	2	0	7	3	9	3	0	15	0	2	0	3	5	1	7	2	2	12	39
06:45 AM	1	7	3	2	13	3	19	4	3	29	0	2	1	3	6	3	5	4	1	13	61
Total	9	19	12	3	43	9	43	10	6	68	1	8	3	6	18	5	35	11	6	57	186
07:00 AM	5	3	6	0	14	1	18	8	0	27	1	1	0	1	3	3	3	1	3	10	54
07:15 AM	8	4	3	4	19	7	24	5	2	38	0	2	5	2	9	2	5	2	1	10	76
07:30 AM	4	6	5	2	17	3	24	8	5	40	0	4	0	8	12	3	11	0	2	16	85
07:45 AM	6	6	10	3	25	5	33	3	4	45	0	4	2	2	8	4	4	6	1	15	93
Total	23	19	24	9	75	16	99	24	11	150	1	11	7	13	32	12	23	9	7	51	308
08:00 AM	7	5	9	0	21	8	30	8	1	47	1	6	1	8	16	5	7	4	3	19	103
08:15 AM	5	8	14	0	27	10	43	7	2	62	1	9	5	12	27	4	13	5	1	23	139
08:30 AM	5	7	7	0	19	4	21	2	1	28	1	6	5	5	17	8	3	4	0	15	79
08:45 AM	6	6	9	0	21	9	29	4	0	42	2	13	2	8	25	3	17	3	1	24	112
Total	23	26	39	0	88	31	123	21	4	179	5	34	13	33	85	20	40	16	5	81	433
Grand Total	55	64	75	12	206	56	265	55	21	397	7	53	23	52	135	37	98	36	18	189	927
Apprch %	26.7	31.1	36.4	5.8		14.1	66.8	13.9	5.3		5.2	39.3	17	38.5		19.6	51.9	19	9.5		
Total %	5.9	6.9	8.1	1.3	22.2	6	28.6	5.9	2.3	42.8	0.8	5.7	2.5	5.6	14.6	4	10.6	3.9	1.9	20.4	

	Cooke Street Southbound				Ilalo Street Westbound				Cooke Street Northbound				Ilalo 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 08:00 AM																	
08:00 AM	**7**	5	9	21	8	30	**8**	46	1	6	1	8	5	7	4	16	91
08:15 AM	5	**8**	**14**	**27**	**10**	**43**	7	**60**	1	9	**5**	15	4	13	**5**	22	**124**
08:30 AM	5	7	**7**	19	4	21	2	27	1	6	5	12	**8**	3	4	15	73
08:45 AM	6	6	9	21	9	29	4	42	**2**	**13**	2	**17**	3	17	3	**23**	103
Total Volume	23	26	39	88	31	123	21	175	5	34	13	52	20	40	16	76	391
% App. Total	26.1	29.5	44.3		17.7	70.3	12		9.6	65.4	25		26.3	52.6	21.1		
PHF	.821	.813	.696	.815	.775	.715	.656	.729	.625	.654	.650	.765	.625	.588	.800	.826	.788

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:GC
Counters:D4-5673
Weather:Clear

File Name : IlaCoo PM
Site Code : 00000002
Start Date : 5/13/2015
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Ilalo Street Westbound					Cooke Street Northbound					Ilalo 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	2	1	3	0	6	0	18	7	1	26	2	10	4	1	17	7	14	3	4	28	77
03:15 PM	1	6	1	0	8	1	37	17	6	61	2	4	5	0	11	3	21	5	2	31	111
03:30 PM	2	7	3	0	12	2	19	10	0	31	2	11	3	3	19	6	19	2	1	28	90
03:45 PM	1	1	5	1	8	1	33	9	2	45	3	8	4	2	17	0	21	2	1	24	94
Total	6	15	12	1	34	4	107	43	9	163	9	33	16	6	64	16	75	12	8	111	372
04:00 PM	3	4	11	5	23	7	39	10	5	61	2	9	2	9	22	11	26	7	7	51	157
04:15 PM	1	7	2	0	10	4	25	3	0	32	3	4	6	3	16	6	22	3	3	34	92
04:30 PM	4	12	7	2	25	3	51	10	2	66	7	6	4	7	24	11	45	10	6	72	187
04:45 PM	5	7	7	0	19	5	28	4	4	41	2	8	2	2	14	10	37	3	0	50	124
Total	13	30	27	7	77	19	143	27	11	200	14	27	14	21	76	38	130	23	16	207	560
05:00 PM	4	7	6	2	19	3	32	4	4	43	7	6	6	1	20	8	41	5	4	58	140
05:15 PM	3	3	10	9	25	9	29	3	6	47	6	7	6	9	28	6	43	5	6	60	160
05:30 PM	2	8	10	1	21	5	17	7	3	32	2	5	6	12	25	5	33	7	4	49	127
05:45 PM	2	8	1	0	11	9	27	16	0	52	4	10	5	1	20	6	18	5	4	33	116
Total	11	26	27	12	76	26	105	30	13	174	19	28	23	23	93	25	135	22	18	200	543
Grand Total	30	71	66	20	187	49	355	100	33	537	42	88	53	50	233	79	340	57	42	518	1475
Apprch %	16	38	35.3	10.7		9.1	66.1	18.6	6.1		18	37.8	22.7	21.5		15.3	65.6	11	8.1		
Total %	2	4.8	4.5	1.4	12.7	3.3	24.1	6.8	2.2	36.4	2.8	6	3.6	3.4	15.8	5.4	23.1	3.9	2.8	35.1	

	Cooke Street Southbound				Ilalo Street Westbound				Cooke Street Northbound				Ilalo 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	4	**12**	7	**23**	3	**51**	**10**	**64**	**7**	6	4	17	**11**	**45**	**10**	**66**	**170**
04:45 PM	**5**	7	7	19	5	28	4	37	2	**8**	2	12	10	37	3	50	118
05:00 PM	4	7	6	17	3	32	4	39	7	6	**6**	**19**	8	41	5	54	129
05:15 PM	3	3	**10**	16	**9**	29	3	41	6	7	6	19	6	43	5	54	130
Total Volume	16	29	30	75	20	140	21	181	22	27	18	67	35	166	23	224	547
% App. Total	21.3	38.7	40		11	77.3	11.6		32.8	40.3	26.9		15.6	74.1	10.3		
PHF	.800	.604	.750	.815	.556	.686	.525	.707	.786	.844	.750	.882	.795	.922	.575	.848	.804

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:PA, RF
Counters:TU-0649, TU-0654
Weather:Clear

File Name : IlaCor AM
Site Code : 00000000
Start Date : 5/13/2015
Page No : 1

Groups Printed- Unshifted

	Coral Street Southbound					Ilalo Street Westbound					Northbound	Ilalo 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	3	0	4	2	9	0	8	3	0	11	0	3	11	0	2	16	36
06:15 AM	1	0	2	1	4	0	6	6	0	12	0	1	14	0	1	16	32
06:30 AM	3	0	4	0	7	0	9	2	2	13	0	1	7	0	1	9	29
06:45 AM	4	0	3	1	8	1	15	7	0	23	0	3	8	0	1	12	43
Total	11	0	13	4	28	1	38	18	2	59	0	8	40	0	5	53	140
07:00 AM	1	0	6	0	7	1	11	14	0	26	0	1	6	0	3	10	43
07:15 AM	3	0	3	2	8	0	12	15	1	28	0	5	6	0	1	12	48
07:30 AM	7	0	4	3	14	0	20	9	4	33	0	2	7	0	5	14	61
07:45 AM	7	0	5	2	14	0	24	19	2	45	0	2	7	0	0	9	68
Total	18	0	18	7	43	1	67	57	7	132	0	10	26	0	9	45	220
08:00 AM	5	0	6	0	11	0	15	25	2	42	0	2	11	0	7	20	73
08:15 AM	6	0	6	1	13	0	41	17	5	63	0	4	16	0	6	26	102
08:30 AM	3	0	10	2	15	1	16	13	6	36	0	7	12	0	7	26	77
08:45 AM	9	0	6	0	15	0	28	12	4	44	0	4	14	0	0	18	77
Total	23	0	28	3	54	1	100	67	17	185	0	17	53	0	20	90	329
Grand Total	52	0	59	14	125	3	205	142	26	376	0	35	119	0	34	188	689
Apprch %	41.6	0	47.2	11.2		0.8	54.5	37.8	6.9			18.6	63.3	0	18.1		
Total %	7.5	0	8.6	2	18.1	0.4	29.8	20.6	3.8	54.6	0	5.1	17.3	0	4.9	27.3	

	Coral Street Southbound				Ilalo Street Westbound				Northbound	Ilalo 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 08:00 AM														
08:00 AM	5	0	6	11	0	15	**25**	40	0	2	11	0	13	64
08:15 AM	6	0	6	12	0	**41**	17	**58**	0	4	**16**	0	**20**	**90**
08:30 AM	3	0	**10**	13	**1**	16	13	30	0	**7**	12	0	19	62
08:45 AM	**9**	0	6	**15**	0	28	12	40	0	4	14	0	18	73
Total Volume	23	0	28	51	1	100	67	168	0	17	53	0	70	289
% App. Total	45.1	0	54.9		0.6	59.5	39.9			24.3	75.7	0		
PHF	.639	.000	.700	.850	.250	.610	.670	.724	.000	.607	.828	.000	.875	.803

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:PA, RF
Counters:TU-0649, TU-0654
Weather:Clear

File Name : IlaCor PM
Site Code : 00000000
Start Date : 5/13/2015
Page No : 1

Groups Printed- Unshifted

	Coral Street Southbound					Ilalo Street Westbound					Northbound	Ilalo 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	4	0	4	0	8	0	21	2	0	23	0	1	20	0	9	30	61
03:15 PM	5	0	4	1	10	0	34	6	3	43	0	3	24	0	15	42	95
03:30 PM	7	0	0	0	7	0	21	3	3	27	0	4	20	0	7	31	65
03:45 PM	8	1	3	1	13	1	32	8	1	42	0	4	15	0	1	20	75
Total	24	1	11	2	38	1	108	19	7	135	0	12	79	0	32	123	296
04:00 PM	16	0	9	2	27	1	45	6	5	57	0	3	27	0	5	35	119
04:15 PM	12	0	4	3	19	1	20	9	4	34	0	8	19	0	5	32	85
04:30 PM	11	0	2	4	17	5	52	8	6	71	0	0	55	0	5	60	148
04:45 PM	10	0	4	1	15	1	26	10	4	41	0	3	40	0	5	48	104
Total	49	0	19	10	78	8	143	33	19	203	0	14	141	0	20	175	456
05:00 PM	14	1	4	3	22	0	34	11	1	46	0	4	40	0	3	47	115
05:15 PM	12	0	5	6	23	1	34	10	5	50	0	4	42	0	4	50	123
05:30 PM	7	0	4	2	13	0	26	3	0	29	0	1	38	0	5	44	86
05:45 PM	8	0	2	4	14	2	22	8	1	33	0	2	21	0	1	24	71
Total	41	1	15	15	72	3	116	32	7	158	0	11	141	0	13	165	395
Grand Total	114	2	45	27	188	12	367	84	33	496	0	37	361	0	65	463	1147
Apprch %	60.6	1.1	23.9	14.4		2.4	74	16.9	6.7			8	78	0	14		
Total %	9.9	0.2	3.9	2.4	16.4	1	32	7.3	2.9	43.2	0	3.2	31.5	0	5.7	40.4	

	Coral Street Southbound				Ilalo Street Westbound				Northbound	Ilalo 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 04:30 PM														
04:30 PM	11	0	2	13	**5**	**52**	8	**65**	0	0	**55**	0	**55**	133
04:45 PM	10	0	4	14	1	26	10	37	0	3	40	0	43	94
05:00 PM	**14**	**1**	4	**19**	0	34	**11**	45	0	**4**	40	0	44	108
05:15 PM	12	0	**5**	17	1	34	10	45	0	4	42	0	46	108
Total Volume	47	1	15	63	7	146	39	192	0	11	177	0	188	443
% App. Total	74.6	1.6	23.8		3.6	76	20.3			5.9	94.1	0		
PHF	.839	.250	.750	.829	.350	.702	.886	.738	.000	.688	.805	.000	.855	.833

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:FS, AC
Counters:D4-5674, D4-3888
Weather:Clear

File Name : IlaKea AM
Site Code : 00000002
Start Date : 5/13/2015
Page No : 1

Groups Printed- Unshifted

	Keawe Street Southbound					Ilalo Street Westbound					Keawe Street Northbound					Ilalo 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	4	1	1	3	9	0	12	0	0	12	0	1	0	6	7	0	10	0	3	13	41
06:15 AM	2	1	0	1	4	0	8	0	1	9	1	1	0	3	5	0	13	0	1	14	32
06:30 AM	1	2	1	4	8	1	10	2	2	15	0	1	0	3	4	0	7	0	4	11	38
06:45 AM	3	0	2	4	9	2	12	4	2	20	0	0	1	13	14	0	7	1	1	9	52
Total	10	4	4	12	30	3	42	6	5	56	1	3	1	25	30	0	37	1	9	47	163
07:00 AM	3	0	3	2	8	3	10	4	5	22	1	0	0	11	12	0	4	0	0	4	46
07:15 AM	6	0	1	3	10	2	11	2	2	17	1	0	0	16	17	0	5	3	3	11	55
07:30 AM	1	1	1	3	6	4	18	2	4	28	3	0	0	16	19	0	8	0	0	8	61
07:45 AM	4	2	1	2	9	4	18	7	2	31	0	1	0	13	14	0	5	1	1	7	61
Total	14	3	6	10	33	13	57	15	13	98	5	1	0	56	62	0	22	4	4	30	223
08:00 AM	5	2	2	2	11	3	13	4	1	21	1	1	2	14	18	0	6	2	5	13	63
08:15 AM	7	0	3	6	16	6	37	4	9	56	0	0	3	33	36	2	10	2	16	30	138
08:30 AM	9	1	3	2	15	1	20	5	3	29	0	2	2	21	25	1	8	0	5	14	83
08:45 AM	4	1	1	2	8	4	21	9	8	42	1	3	4	29	37	1	10	2	0	13	100
Total	25	4	9	12	50	14	91	22	21	148	2	6	11	97	116	4	34	6	26	70	384
Grand Total	49	11	19	34	113	30	190	43	39	302	8	10	12	178	208	4	93	11	39	147	770
Apprch %	43.4	9.7	16.8	30.1		9.9	62.9	14.2	12.9		3.8	4.8	5.8	85.6		2.7	63.3	7.5	26.5		
Total %	6.4	1.4	2.5	4.4	14.7	3.9	24.7	5.6	5.1	39.2	1	1.3	1.6	23.1	27	0.5	12.1	1.4	5.1	19.1	

	Keawe Street Southbound				Ilalo Street Westbound				Keawe Street Northbound				Ilalo 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 08:00 AM																	
08:00 AM	5	**2**	2	9	3	13	4	20	**1**	1	2	4	0	6	**2**	8	41
08:15 AM	7	0	**3**	10	**6**	**37**	4	**47**	0	0	3	3	**2**	**10**	2	14	74
08:30 AM	**9**	1	3	**13**	1	20	5	26	0	2	2	4	1	8	0	9	52
08:45 AM	4	1	1	6	4	21	**9**	34	1	**3**	**4**	**8**	1	10	2	13	61
Total Volume	25	4	9	38	14	91	22	127	2	6	11	19	4	34	6	44	228
% App. Total	65.8	10.5	23.7		11	71.7	17.3		10.5	31.6	57.9		9.1	77.3	13.6		
PHF	.694	.500	.750	.731	.583	.615	.611	.676	.500	.500	.688	.594	.500	.850	.750	.786	.770

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:FS, AC
Counters:D4-3888, D4-5674
Weather:Clear

File Name : IlaKea PM
Site Code : 00000002
Start Date : 5/13/2015
Page No : 1

Groups Printed- Unshifted

	Keawe Street Southbound					Ilalo Street Westbound					Keawe Street Northbound					Ilalo 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	5	3	2	1	11	1	18	6	3	28	1	6	4	5	16	3	12	3	1	19	74
03:15 PM	8	1	0	1	10	5	32	1	2	40	4	6	6	12	28	5	13	1	4	23	101
03:30 PM	5	3	3	0	11	2	14	5	6	27	2	6	4	5	17	4	15	1	0	20	75
03:45 PM	3	1	2	1	7	2	29	4	3	38	2	6	2	1	11	5	14	5	2	26	82
Total	21	8	7	3	39	10	93	16	14	133	9	24	16	23	72	17	54	10	7	88	332
04:00 PM	7	6	1	1	15	7	35	12	2	56	1	2	3	16	22	5	20	5	1	31	124
04:15 PM	6	1	0	0	7	3	20	1	3	27	4	2	2	6	14	4	19	4	2	29	77
04:30 PM	7	3	1	0	11	5	42	7	1	55	2	9	12	8	31	4	36	3	1	44	141
04:45 PM	11	2	1	1	15	1	23	6	0	30	0	4	2	12	18	4	30	2	0	36	99
Total	31	12	3	2	48	16	120	26	6	168	7	17	19	42	85	17	105	14	4	140	441
05:00 PM	15	2	2	1	20	4	31	3	0	38	0	8	4	7	19	3	25	5	0	33	110
05:15 PM	11	0	2	1	14	9	24	6	3	42	5	3	5	19	32	4	30	1	1	36	124
05:30 PM	12	0	0	0	12	3	25	2	3	33	0	3	1	16	20	6	26	1	1	34	99
05:45 PM	6	1	0	0	7	3	19	2	1	25	1	0	3	8	12	3	14	1	3	21	65
Total	44	3	4	2	53	19	99	13	7	138	6	14	13	50	83	16	95	8	5	124	398
Grand Total	96	23	14	7	140	45	312	55	27	439	22	55	48	115	240	50	254	32	16	352	1171
Apprch %	68.6	16.4	10	5		10.3	71.1	12.5	6.2		9.2	22.9	20	47.9		14.2	72.2	9.1	4.5		
Total %	8.2	2	1.2	0.6	12	3.8	26.6	4.7	2.3	37.5	1.9	4.7	4.1	9.8	20.5	4.3	21.7	2.7	1.4	30.1	

	Keawe Street Southbound				Ilalo Street Westbound				Keawe Street Northbound				Ilalo 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	7	**3**	1	11	5	**42**	**7**	**54**	2	**9**	**12**	**23**	**4**	**36**	3	43	**131**
04:45 PM	11	2	1	14	1	23	6	30	0	4	2	6	4	30	2	36	86
05:00 PM	**15**	2	**2**	**19**	4	31	3	38	0	8	4	12	3	25	**5**	33	102
05:15 PM	11	0	2	13	**9**	24	6	39	**5**	3	5	13	4	30	1	35	100
Total Volume	44	7	6	57	19	120	22	161	7	24	23	54	15	121	11	147	419
% App. Total	77.2	12.3	10.5		11.8	74.5	13.7		13	44.4	42.6		10.2	82.3	7.5		
PHF	.733	.583	.750	.750	.528	.714	.786	.745	.350	.667	.479	.587	.938	.840	.550	.855	.800

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:CK
Counters:D4-3890, D4-3889
Weather:Clear

File Name : Parking Lot PM CK- West 1
Site Code : 00000000
Start Date : 5/12/2015
Page No : 1

Groups Printed- Unshifted

	Forrest Avenue Thru = To Matson Security Gates Southbound					Ilalo Street Left = LT Into Re-Use Hawaii Westbound					Matson Security Gates Right = RT To Ilalo Street Northbound					Eastbound	
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
03:00 PM	6	0	0	0	6	0	0	0	0	0	0	6	1	0	7	0	13
03:15 PM	12	2	0	0	14	0	0	0	0	0	0	1	0	0	1	0	15
03:30 PM	5	0	0	0	5	2	0	0	0	2	0	12	1	0	13	0	20
03:45 PM	9	1	0	0	10	1	0	0	0	1	0	4	1	0	5	0	16
Total	32	3	0	0	35	3	0	0	0	3	0	23	3	0	26	0	64
04:00 PM	11	0	0	0	11	0	0	0	0	0	0	1	0	0	1	0	12
04:15 PM	11	1	0	0	12	3	0	0	0	3	0	2	0	0	2	0	17
04:30 PM	9	0	0	0	9	0	0	0	0	0	0	1	0	0	1	0	10
04:45 PM	16	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	16
Total	47	1	0	0	48	3	0	0	0	3	0	4	0	0	4	0	55
05:00 PM	18	0	0	0	18	3	0	0	0	3	0	0	0	0	0	0	21
05:15 PM	19	2	0	0	21	3	0	0	0	3	0	0	0	0	0	0	24
05:30 PM	17	0	0	0	17	1	0	0	0	1	0	1	0	0	1	0	19
05:45 PM	5	1	0	0	6	1	0	0	0	1	0	0	0	0	0	0	7
Total	59	3	0	0	62	8	0	0	0	8	0	1	0	0	1	0	71
Grand Total	138	7	0	0	145	14	0	0	0	14	0	28	3	0	31	0	190
Apprch %	95.2	4.8	0	0		100	0	0	0		0	90.3	9.7	0			
Total %	72.6	3.7	0	0	76.3	7.4	0	0	0	7.4	0	14.7	1.6	0	16.3	0	

	Forrest Avenue Thru = To Matson Security Gates Southbound				Ilalo Street Left = LT Into Re-Use Hawaii Westbound				Matson Security Gates Right = RT To Ilalo Street Northbound				Eastbound	
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	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	16	0	0	16	0	0	0	0	0	0	0	0	0	16
05:00 PM	18	0	0	18	**3**	0	0	**3**	0	0	0	0	0	21
05:15 PM	**19**	**2**	0	**21**	3	0	0	3	0	0	0	0	0	**24**
05:30 PM	17	0	0	17	1	0	0	1	0	**1**	0	**1**	0	19
Total Volume	70	2	0	72	7	0	0	7	0	1	0	1	0	80
% App. Total	97.2	2.8	0		100	0	0		0	100	0			
PHF	.921	.250	.000	.857	.583	.000	.000	.583	.000	.250	.000	.250	.000	.833

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:CK
Counters:D4-3889
Weather:Clear

File Name : Parking Lot PM CK- West 2
Site Code : 00000000
Start Date : 5/12/2015
Page No : 1

Groups Printed- Unshifted

	Forrest Avenue Thru = To Re-Use Hawaii Southbound					Westbound	Re-Use Hawaii Northbound					Eastbound	
Start Time	Left	Thru	Right	Peds	App. Total	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
03:00 PM	0	4	0	0	4	0	0	0	2	0	2	0	6
03:15 PM	0	2	0	0	2	0	0	2	1	0	3	0	5
03:30 PM	0	2	0	0	2	0	0	3	1	0	4	0	6
03:45 PM	0	5	0	0	5	0	0	6	1	0	7	0	12
Total	0	13	0	0	13	0	0	11	5	0	16	0	29
04:00 PM	0	1	0	0	1	0	0	2	2	0	4	0	5
04:15 PM	0	2	0	0	2	0	0	4	0	0	4	0	6
04:30 PM	0	1	0	0	1	0	0	0	2	0	2	0	3
04:45 PM	0	3	0	0	3	0	0	1	1	0	2	0	5
Total	0	7	0	0	7	0	0	7	5	0	12	0	19
05:00 PM	0	3	0	0	3	0	0	6	4	0	10	0	13
05:15 PM	0	4	0	0	4	0	0	3	0	0	3	0	7
05:30 PM	0	3	0	0	3	0	0	3	1	0	4	0	7
05:45 PM	0	3	0	0	3	0	0	0	3	0	3	0	6
Total	0	13	0	0	13	0	0	12	8	0	20	0	33
Grand Total	0	33	0	0	33	0	0	30	18	0	48	0	81
Apprch %	0	100	0	0			0	62.5	37.5	0			
Total %	0	40.7	0	0	40.7	0	0	37	22.2	0	59.3	0	

	Forrest Avenue Thru = To Re-Use Hawaii Southbound				Westbound	Re-Use Hawaii Northbound				Eastbound	
Start Time	Left	Thru	Right	App. Total	App. Total	Left	Thru	Right	App. Total	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 05:00 PM											
05:00 PM	0	3	0	3	0	0	**6**	**4**	**10**	0	**13**
05:15 PM	0	**4**	0	**4**	0	0	3	0	3	0	7
05:30 PM	0	3	0	3	0	0	3	1	4	0	7
05:45 PM	0	3	0	3	0	0	0	3	3	0	6
Total Volume	0	13	0	13	0	0	12	8	20	0	33
% App. Total	0	100	0			0	60	40			
PHF	.000	.813	.000	.813	.000	.000	.500	.500	.500	.000	.635

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:BC
Counters:D4-3890
Weather:Clear

File Name : Parking Lot PM BC - 1
Site Code : 00000000
Start Date : 5/13/2015
Page No : 1

Groups Printed- Unshifted

	Forrest Avenue Southbound					Ilalo Street Left = LT Into Re-Use Hawaii Westbound					Matson Security Gates Right = RT To Ilalo Street Northbound					Eastbound	
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
03:00 PM	11	3	0	0	14	1	0	0	0	1	0	5	1	0	6	0	21
03:15 PM	10	1	0	0	11	2	0	0	0	2	0	5	0	0	5	0	18
03:30 PM	12	1	0	0	13	0	0	0	0	0	0	7	0	0	7	0	20
03:45 PM	15	5	0	0	20	4	0	0	0	4	0	2	0	0	2	0	26
Total	48	10	0	0	58	7	0	0	0	7	0	19	1	0	20	0	85
04:00 PM	10	3	0	0	13	3	0	0	0	3	0	5	3	0	8	0	24
04:15 PM	11	4	0	0	15	1	0	0	0	1	0	3	1	0	4	0	20
04:30 PM	22	5	0	0	27	1	0	0	0	1	0	7	3	0	10	0	38
04:45 PM	20	0	0	0	20	0	0	0	0	0	0	13	1	0	14	0	34
Total	63	12	0	0	75	5	0	0	0	5	0	28	8	0	36	0	116
05:00 PM	15	4	0	0	19	1	0	0	0	1	0	18	6	0	24	0	44
05:15 PM	15	7	0	0	22	1	0	0	0	1	0	5	4	0	9	0	32
05:30 PM	19	14	0	0	33	1	0	0	0	1	0	4	0	0	4	0	38
05:45 PM	10	6	0	0	16	1	0	0	0	1	0	2	0	0	2	0	19
Total	59	31	0	0	90	4	0	0	0	4	0	29	10	0	39	0	133
Grand Total	170	53	0	0	223	16	0	0	0	16	0	76	19	0	95	0	334
Apprch %	76.2	23.8	0	0		100	0	0	0		0	80	20	0			
Total %	50.9	15.9	0	0	66.8	4.8	0	0	0	4.8	0	22.8	5.7	0	28.4	0	

	Forrest Avenue Southbound				Ilalo Street Left = LT Into Re-Use Hawaii Westbound				Matson Security Gates Right = RT To Ilalo Street Northbound				Eastbound	
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	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	**22**	5	0	**27**	**1**	0	0	**1**	0	7	3	10	0	38
04:45 PM	20	0	0	20	0	0	0	0	0	13	1	14	0	34
05:00 PM	15	4	0	19	1	0	0	1	0	**18**	**6**	**24**	0	**44**
05:15 PM	15	**7**	0	22	1	0	0	1	0	5	4	9	0	32
Total Volume	72	16	0	88	3	0	0	3	0	43	14	57	0	148
% App. Total	81.8	18.2	0		100	0	0		0	75.4	24.6			
PHF	.818	.571	.000	.815	.750	.000	.000	.750	.000	.597	.583	.594	.000	.841

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:BC
Counters:D4-3890
Weather:Clear

File Name : Parking Lot PM BC - 2
Site Code : 00000000
Start Date : 5/13/2015
Page No : 1

Groups Printed- Unshifted

	Southbound	Westbound	Re-Use Hawaii		Northbound	Thru = To Forrest Avenue		Eastbound	
Start Time	App. Total	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
03:00 PM	0	0	0	4	2	0	6	0	6
03:15 PM	0	0	0	1	0	0	1	0	1
03:30 PM	0	0	0	1	0	0	1	0	1
03:45 PM	0	0	0	3	1	0	4	0	4
Total	0	0	0	9	3	0	12	0	12
04:00 PM	0	0	0	3	2	0	5	0	5
04:15 PM	0	0	0	5	1	0	6	0	6
04:30 PM	0	0	0	5	0	0	5	0	5
04:45 PM	0	0	0	2	1	0	3	0	3
Total	0	0	0	15	4	0	19	0	19
05:00 PM	0	0	0	3	1	0	4	0	4
05:15 PM	0	0	0	3	3	0	6	0	6
05:30 PM	0	0	0	8	1	0	9	0	9
05:45 PM	0	0	0	2	0	0	2	0	2
Total	0	0	0	16	5	0	21	0	21
Grand Total	0	0	0	40	12	0	52	0	52
Apprch %			0	76.9	23.1	0			
Total %	0	0	0	76.9	23.1	0	100	0	

	Southbound	Westbound	Re-Use Hawaii	Forrest Avenue Northbound		Thru = To	Eastbound	
Start Time	App. Total	App. Total	Left	Thru	Right	App. Total	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	0	0	0	2	1	3	0	3
05:00 PM	0	0	0	3	1	4	0	4
05:15 PM	0	0	0	3	**3**	6	0	6
05:30 PM	0	0	0	**8**	1	**9**	0	9
Total Volume	0	0	0	16	6	22	0	22
% App. Total			0	72.7	27.3			
PHF	.000	.000	.000	.500	.500	.611	.000	.611

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:BC
Counters:D4-3890
Weather:Clear

File Name : Parking Lot AM BC - 1
Site Code : 00000000
Start Date : 5/13/2015
Page No : 1

Groups Printed- Unshifted

	Forrest Avenue Southbound					Ilalo Street Left = LT Into Re-Use Hawaii Westbound					Matson Security Gates Right = RT To Ilalo Street Northbound					Eastbound	
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
06:00 AM	16	5	0	0	21	0	0	0	0	0	0	1	0	0	1	0	22
06:15 AM	15	5	0	0	20	1	0	0	0	1	0	0	0	0	0	0	21
06:30 AM	8	6	0	0	14	1	0	0	0	1	0	0	0	0	0	0	15
06:45 AM	9	4	0	0	13	1	0	0	0	1	0	2	1	0	3	0	17
Total	48	20	0	0	68	3	0	0	0	3	0	3	1	0	4	0	75
07:00 AM	18	8	0	0	26	0	0	0	0	0	0	5	1	0	6	0	32
07:15 AM	21	4	0	0	25	1	0	0	0	1	0	3	1	0	4	0	30
07:30 AM	18	8	0	0	26	2	0	0	0	2	0	5	0	0	5	0	33
07:45 AM	13	5	0	0	18	0	0	0	0	0	0	6	0	0	6	0	24
Total	70	25	0	0	95	3	0	0	0	3	0	19	2	0	21	0	119
08:00 AM	13	6	0	0	19	0	0	0	0	0	0	1	0	0	1	0	20
08:15 AM	39	5	0	0	44	4	0	0	0	4	0	2	0	0	2	0	50
08:30 AM	18	15	0	0	33	3	0	0	0	3	0	5	0	0	5	0	41
08:45 AM	20	13	0	0	33	1	0	0	0	1	0	3	0	0	3	0	37
Total	90	39	0	0	129	8	0	0	0	8	0	11	0	0	11	0	148
Grand Total	208	84	0	0	292	14	0	0	0	14	0	33	3	0	36	0	342
Apprch %	71.2	28.8	0	0		100	0	0	0		0	91.7	8.3	0			
Total %	60.8	24.6	0	0	85.4	4.1	0	0	0	4.1	0	9.6	0.9	0	10.5	0	

	Forrest Avenue Southbound				Ilalo Street Left = LT Into Re-Use Hawaii Westbound				Matson Security Gates Right = RT To Ilalo Street Northbound				Eastbound	
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	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 08:00 AM														
08:00 AM	13	6	0	19	0	0	0	0	0	1	0	1	0	20
08:15 AM	**39**	5	0	**44**	**4**	0	0	**4**	0	2	0	2	0	**50**
08:30 AM	18	**15**	0	33	3	0	0	3	0	**5**	0	**5**	0	41
08:45 AM	20	13	0	33	1	0	0	1	0	3	0	3	0	37
Total Volume	90	39	0	129	8	0	0	8	0	11	0	11	0	148
% App. Total	69.8	30.2	0		100	0	0		0	100	0			
PHF	.577	.650	.000	.733	.500	.000	.000	.500	.000	.550	.000	.550	.000	.740

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

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Counters:D4-3890
Weather:Clear

File Name : Parking Lot AM BC - 2
Site Code : 00000000
Start Date : 5/13/2015
Page No : 1

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	Southbound	Westbound	Re-Use Hawaii Thru = To Forrest Avenue Northbound					Eastbound	
Start Time	App. Total	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
06:00 AM	0	0	0	3	0	0	3	0	3
06:15 AM	0	0	0	0	1	0	1	0	1
06:30 AM	0	0	0	0	2	0	2	0	2
06:45 AM	0	0	0	1	0	0	1	0	1
Total	0	0	0	4	3	0	7	0	7
07:00 AM	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	1	0	1	0	1
07:30 AM	0	0	0	7	0	0	7	0	7
07:45 AM	0	0	0	3	1	0	4	0	4
Total	0	0	0	10	2	0	12	0	12
08:00 AM	0	0	0	3	4	0	7	0	7
08:15 AM	0	0	0	1	1	0	2	0	2
08:30 AM	0	0	0	0	5	0	5	0	5
08:45 AM	0	0	0	2	1	0	3	0	3
Total	0	0	0	6	11	0	17	0	17
Grand Total	0	0	0	20	16	0	36	0	36
Apprch %			0	55.6	44.4	0			
Total %	0	0	0	55.6	44.4	0	100	0	

	Southbound	Westbound	Re-Use Hawaii Thru = To Forrest Avenue Northbound				Eastbound	
Start Time	App. Total	App. Total	Left	Thru	Right	App. Total	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	0	0	0	**7**	0	**7**	0	7
07:45 AM	0	0	0	3	1	4	0	4
08:00 AM	0	0	0	3	**4**	7	0	7
08:15 AM	0	0	0	1	1	2	0	2
Total Volume	0	0	0	14	6	20	0	20
% App. Total			0	70	30			
PHF	.000	.000	.000	.500	.375	.714	.000	.714

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Counters:D4-3889
Weather:Clear

File Name : Parking Lot AM HI - 1
Site Code : 00000000
Start Date : 5/13/2015
Page No : 1

Groups Printed- Unshifted

	Forrest Avenue Right = RT In to UH Med School Parking Lot Via Forrest Avenue Southbound					Ilalo Street Left = LT Into Matson Security Gates Westbound					UH Medical School Parking Lot Left = LT From Med School Parking Lot Northbound					Ilalo Street Right = RT Into UH Med School Parking Lot 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	0	7	0	7	0	0	5	0	5	2	0	1	0	3	0	0	0	0	0	15
06:15 AM	0	0	8	0	8	1	0	0	0	1	0	0	5	6	11	0	0	0	0	0	20
06:30 AM	0	0	6	0	6	0	0	4	0	4	2	0	5	1	8	0	0	0	0	0	18
06:45 AM	0	0	2	0	2	0	0	6	0	6	1	0	1	1	3	0	0	0	0	0	11
Total	0	0	23	0	23	1	0	15	0	16	5	0	12	8	25	0	0	0	0	0	64
07:00 AM	0	0	14	0	14	0	0	8	0	8	1	0	0	0	1	0	0	0	0	0	23
07:15 AM	0	0	14	0	14	0	0	4	0	4	0	0	1	8	9	0	0	0	0	0	27
07:30 AM	0	0	10	0	10	0	0	10	0	10	0	0	0	4	4	0	0	0	0	0	24
07:45 AM	0	0	9	0	9	1	0	8	0	9	0	0	1	3	4	0	0	0	0	0	22
Total	0	0	47	0	47	1	0	30	0	31	1	0	2	15	18	0	0	0	0	0	96
08:00 AM	0	0	10	0	10	0	0	4	0	4	1	0	1	2	4	0	0	0	0	0	18
08:15 AM	0	0	29	0	29	0	0	6	0	6	0	0	3	5	8	0	0	0	0	0	43
08:30 AM	0	0	15	0	15	1	0	5	0	6	0	0	1	5	6	0	0	1	0	1	28
08:45 AM	0	0	9	0	9	1	0	5	0	6	0	0	1	0	1	0	0	0	0	0	16
Total	0	0	63	0	63	2	0	20	0	22	1	0	6	12	19	0	0	1	0	1	105
Grand Total	0	0	133	0	133	4	0	65	0	69	7	0	20	35	62	0	0	1	0	1	265
Apprch %	0	0	100	0		5.8	0	94.2	0		11.3	0	32.3	56.5		0	0	100	0		
Total %	0	0	50.2	0	50.2	1.5	0	24.5	0	26	2.6	0	7.5	13.2	23.4	0	0	0.4	0	0.4	

	Forrest Avenue Right = RT In to UH Med School Parking Lot Via Forrest Avenue Southbound				Ilalo Street Left = LT Into Matson Security Gates Westbound				UH Medical School Parking Lot Left = LT From Med School Parking Lot Northbound				Ilalo Street Right = RT Into UH Med School Parking Lot 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	0	0	9	9	**1**	0	**8**	**9**	0	0	1	1	0	0	0	0	19
08:00 AM	0	0	10	10	0	0	4	4	**1**	0	1	2	0	0	0	0	16
08:15 AM	0	0	**29**	**29**	0	0	6	6	0	0	**3**	**3**	0	0	0	0	**38**
08:30 AM	0	0	15	15	1	0	5	6	0	0	1	1	0	0	**1**	**1**	23
Total Volume	0	0	63	63	2	0	23	25	1	0	6	7	0	0	1	1	96
% App. Total	0	0	100		8	0	92		14.3	0	85.7		0	0	100		
PHF	.000	.000	.543	.543	.500	.000	.719	.694	.250	.000	.500	.583	.000	.000	.250	.250	.632

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:HI
Counters:D4-3889
Weather:Clear

File Name : Parking Lot AM HI - 2
Site Code : 00000000
Start Date : 5/13/2015
Page No : 1

Groups Printed- Unshifted

	Southbound	Ilalo Street Left = LT Into UH Med School Parking Lot Westbound					Northbound	Eastbound	
Start Time	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	App. Total	Int. Total
06:00 AM	0	8	0	0	0	8	0	0	8
06:15 AM	0	7	0	0	0	7	0	0	7
06:30 AM	0	6	0	0	0	6	0	0	6
06:45 AM	0	7	0	0	0	7	0	0	7
Total	0	28	0	0	0	28	0	0	28
07:00 AM	0	5	0	0	0	5	0	0	5
07:15 AM	0	8	0	0	0	8	0	0	8
07:30 AM	0	10	0	0	0	10	0	0	10
07:45 AM	0	10	0	0	0	10	0	0	10
Total	0	33	0	0	0	33	0	0	33
08:00 AM	0	12	0	0	0	12	0	0	12
08:15 AM	0	30	0	0	0	30	0	0	30
08:30 AM	0	13	0	0	0	13	0	0	13
08:45 AM	0	16	0	0	0	16	0	0	16
Total	0	71	0	0	0	71	0	0	71
Grand Total	0	132	0	0	0	132	0	0	132
Apprch %		100	0	0	0				
Total %	0	100	0	0	0	100	0	0	

	Southbound	Ilalo Street Left = LT Into UH Med School Parking Lot Westbound				Northbound	Eastbound	
Start Time	App. Total	Left	Thru	Right	App. Total	App. Total	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 08:00 AM								
08:00 AM	0	12	0	0	12	0	0	12
08:15 AM	0	**30**	0	0	**30**	0	0	30
08:30 AM	0	13	0	0	13	0	0	13
08:45 AM	0	16	0	0	16	0	0	16
Total Volume	0	71	0	0	71	0	0	71
% App. Total		100	0	0				
PHF	.000	.592	.000	.000	.592	.000	.000	.592

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	Forrest Avenue Right = RT Into UH Med. School Parking Lot Via Forrest Avenue Southbound					Ilalo Street Left = LT Into Matson Security Gates Westbound					UH Medical School Parking Lot Left = LT From Med School Parking Lot Northbound					Ilalo Street Right = RT Into UH Med School Parking Lot 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	0	0	1	0	1	2	0	18	0	20	2	0	0	3	5	0	0	0	0	0	26
03:15 PM	0	0	1	0	1	2	0	31	0	33	10	0	0	1	11	0	0	0	0	0	45
03:30 PM	0	0	0	0	0	0	0	19	0	19	4	0	0	0	4	0	0	0	0	0	23
03:45 PM	0	0	3	0	3	3	0	25	0	28	8	0	0	1	9	0	0	0	0	0	40
Total	0	0	5	0	5	7	0	93	0	100	24	0	0	5	29	0	0	0	0	0	134
04:00 PM	0	0	1	0	1	1	0	32	0	33	12	0	0	2	14	0	0	0	0	0	48
04:15 PM	0	0	1	0	1	0	0	20	0	20	4	0	0	4	8	0	0	0	0	0	29
04:30 PM	0	0	0	0	0	0	0	42	0	42	10	0	0	4	14	0	0	0	0	0	56
04:45 PM	0	0	2	0	2	0	0	21	0	21	6	0	0	2	8	0	0	0	0	0	31
Total	0	0	4	0	4	1	0	115	0	116	32	0	0	12	44	0	0	0	0	0	164
05:00 PM	0	0	0	0	0	4	0	25	0	29	6	0	0	2	8	0	0	0	0	0	37
05:15 PM	0	0	4	0	4	3	0	24	0	27	8	0	0	1	9	0	0	0	0	0	40
05:30 PM	0	0	0	0	0	2	0	21	0	23	5	0	0	16	21	0	0	0	0	0	44
05:45 PM	0	0	0	0	0	1	0	17	0	18	7	0	0	4	11	0	0	0	0	0	29
Total	0	0	4	0	4	10	0	87	0	97	26	0	0	23	49	0	0	0	0	0	150
Grand Total	0	0	13	0	13	18	0	295	0	313	82	0	0	40	122	0	0	0	0	0	448
Apprch %	0	0	100	0		5.8	0	94.2	0		67.2	0	0	32.8		0	0	0	0		
Total %	0	0	2.9	0	2.9	4	0	65.8	0	69.9	18.3	0	0	8.9	27.2	0	0	0	0	0	

	Forrest Avenue Right = RT Into UH Med. School Parking Lot Via Forrest Avenue Southbound				Ilalo Street Left = LT Into Matson Security Gates Westbound				UH Medical School Parking Lot Left = LT From Med School Parking Lot Northbound				Ilalo Street Right = RT Into UH Med School Parking Lot 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 03:45 PM																	
03:45 PM	0	0	**3**	**3**	**3**	0	25	28	8	0	0	8	0	0	0	0	39
04:00 PM	0	0	1	1	1	0	32	33	**12**	0	0	**12**	0	0	0	0	46
04:15 PM	0	0	1	1	0	0	20	20	4	0	0	4	0	0	0	0	25
04:30 PM	0	0	0	0	0	0	**42**	**42**	10	0	0	10	0	0	0	0	**52**
Total Volume	0	0	5	5	4	0	119	123	34	0	0	34	0	0	0	0	162
% App. Total	0	0	100		3.3	0	96.7		100	0	0		0	0	0		
PHF	.000	.000	.417	.417	.333	.000	.708	.732	.708	.000	.000	.708	.000	.000	.000	.000	.779

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Site Code : 00000000
Start Date : 5/13/2015
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Groups Printed- Unshifted

	Southbound	Ilalo Street Left = LT Into UH Med School Parking Lot Westbound					Northbound	Eastbound	
Start Time	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	3	0	0	0	3	0	0	3
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	1	0	0	0	1	0	0	1
Total	0	4	0	0	0	4	0	0	4
04:00 PM	0	1	0	0	0	1	0	0	1
04:15 PM	0	3	0	0	0	3	0	0	3
04:30 PM	0	2	0	0	0	2	0	0	2
04:45 PM	0	1	0	0	0	1	0	0	1
Total	0	7	0	0	0	7	0	0	7
05:00 PM	0	3	0	0	0	3	0	0	3
05:15 PM	0	3	0	0	0	3	0	0	3
05:30 PM	0	1	0	0	0	1	0	0	1
05:45 PM	0	1	0	0	0	1	0	0	1
Total	0	8	0	0	0	8	0	0	8
Grand Total	0	19	0	0	0	19	0	0	19
Apprch %		100	0	0	0				
Total %	0	100	0	0	0	100	0	0	

	Southbound	Ilalo Street Left = LT Into UH Med School Parking Lot Westbound				Northbound	Eastbound	
Start Time	App. Total	Left	Thru	Right	App. Total	App. Total	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 04:15 PM								
04:15 PM	0	3	0	0	3	0	0	3
04:30 PM	0	2	0	0	2	0	0	2
04:45 PM	0	1	0	0	1	0	0	1
05:00 PM	0	3	0	0	3	0	0	3
Total Volume	0	9	0	0	9	0	0	9
% App. Total		100	0	0				
PHF	.000	.750	.000	.000	.750	.000	.000	.750

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.

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

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

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

APPENDIX C

CAPACITY ANALYSIS CALCULATIONS
EXISTING PEAK PERIOD TRAFFIC ANALYSIS

HCM Unsignalized Intersection Capacity Analysis
3: Ilalo St & Forrest Ave

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↱		↰	↑
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	5	17	30	5	81	43
Future Volume (vph)	5	17	30	5	81	43
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	6	22	38	6	103	54

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	28	25	19	103	54
Volume Left (vph)	6	0	0	103	0
Volume Right (vph)	22	0	6	0	0
Hadj (s)	-0.39	0.03	-0.19	0.53	0.03
Departure Headway (s)	4.0	4.7	4.5	5.1	4.6
Degree Utilization, x	0.03	0.03	0.02	0.15	0.07
Capacity (veh/h)	863	747	783	687	763
Control Delay (s)	7.1	6.7	6.4	7.8	6.8
Approach Delay (s)	7.1	6.6		7.4	
Approach LOS	A	A		A	

Intersection Summary			
Delay	7.2		
Level of Service	A		
Intersection Capacity Utilization	21.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Ilalo St & Forrest Ave

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↱		↰	↑
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	3	139	11	5	58	8
Future Volume (vph)	3	139	11	5	58	8
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	4	174	14	6	73	10

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	178	9	11	73	10
Volume Left (vph)	4	0	0	73	0
Volume Right (vph)	174	0	6	0	0
Hadj (s)	-0.55	0.03	-0.36	0.53	0.03
Departure Headway (s)	3.6	5.0	4.6	5.4	4.9
Degree Utilization, x	0.18	0.01	0.01	0.11	0.01
Capacity (veh/h)	968	690	748	636	702
Control Delay (s)	7.4	6.8	6.4	7.9	6.8
Approach Delay (s)	7.4	6.6		7.7	
Approach LOS	A	A		A	

Intersection Summary			
Delay	7.5		
Level of Service	A		
Intersection Capacity Utilization	25.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Cooke St & Ilalo St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	44	12	23	116	24	1	16	8	25	21	28
Future Volume (vph)	14	44	12	23	116	24	1	16	8	25	21	28
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	16	52	14	27	136	28	1	19	9	29	25	33

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	82	191	29	54	33
Volume Left (vph)	16	27	1	29	0
Volume Right (vph)	14	28	9	0	33
Hadj (s)	-0.03	-0.03	-0.15	0.30	-0.67
Departure Headway (s)	4.4	4.3	4.6	5.4	4.5
Degree Utilization, x	0.10	0.23	0.04	0.08	0.04
Capacity (veh/h)	794	823	730	622	753
Control Delay (s)	7.8	8.5	7.8	7.7	6.5
Approach Delay (s)	7.8	8.5	7.8	7.3	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	8.0		
Level of Service	A		
Intersection Capacity Utilization	32.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Cooke St & Ilalo St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	35	134	21	15	127	21	19	24	18	14	33	22
Future Volume (vph)	35	134	21	15	127	21	19	24	18	14	33	22
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	47	181	28	20	172	28	26	32	24	19	45	30

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	256	220	82	64	30
Volume Left (vph)	47	20	26	19	0
Volume Right (vph)	28	28	24	0	30
Hadj (s)	0.01	-0.02	-0.08	0.18	-0.67
Departure Headway (s)	4.7	4.7	5.2	5.9	5.1
Degree Utilization, x	0.33	0.29	0.12	0.11	0.04
Capacity (veh/h)	734	732	623	553	641
Control Delay (s)	9.9	9.5	8.9	8.4	7.1
Approach Delay (s)	9.9	9.5	8.9	8.0	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	9.4		
Level of Service	A		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
8: Forrest Ave/South St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱			↑↑↱		↰	↱			↰↑	↱
Traffic Volume (vph)	217	2086	140	0	1688	45	33	19	1	7	15	32
Future Volume (vph)	217	2086	140	0	1688	45	33	19	1	7	15	32
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	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	0.90
Flpb, ped/bikes	1.00	1.00			1.00		0.92	1.00			1.00	1.00
Frt	1.00	0.99			1.00		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	5028			5063		1623	1849			1834	1432
Flt Permitted	0.95	1.00			1.00		0.74	1.00			0.89	1.00
Satd. Flow (perm)	1770	5028			5063		1270	1849			1657	1432
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	224	2151	144	0	1740	46	34	20	1	7	15	33
RTOR Reduction (vph)	0	4	0	0	2	0	0	1	0	0	0	0
Lane Group Flow (vph)	224	2291	0	0	1784	0	34	20	0	0	22	33
Confl. Peds. (#/hr)			11			3	53					53
Turn Type	Prot	NA			NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	19.2	79.4			55.2		7.1	7.1			7.1	7.1
Effective Green, g (s)	19.2	79.4			55.2		7.1	7.1			7.1	7.1
Actuated g/C Ratio	0.20	0.82			0.57		0.07	0.07			0.07	0.07
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	352	4137			2896		93	136			121	105
v/s Ratio Prot	c0.13	0.46			c0.35			0.01				
v/s Ratio Perm							c0.03				0.01	0.02
v/c Ratio	0.64	0.55			0.62		0.37	0.15			0.18	0.31
Uniform Delay, d1	35.4	2.8			13.6		42.6	41.9			42.0	42.4
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.7	0.2			0.4		2.4	0.5			0.7	1.7
Delay (s)	39.2	2.9			14.0		45.0	42.4			42.7	44.1
Level of Service	D	A			B		D	D			D	D
Approach Delay (s)		6.2			14.0			44.0			43.5	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	96.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Forrest Ave/South St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱			↑↑↱		↰	↱			↰↑	↱
Traffic Volume (vph)	163	2203	67	0	1728	34	97	47	6	13	4	140
Future Volume (vph)	163	2203	67	0	1728	34	97	47	6	13	4	140
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	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	0.90
Flpb, ped/bikes	1.00	1.00			1.00		0.92	1.00			1.00	1.00
Frt	1.00	1.00			1.00		1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5053			5067		1622	1832			1794	1432
Flt Permitted	0.95	1.00			1.00		0.75	1.00			0.83	1.00
Satd. Flow (perm)	1770	5053			5067		1274	1832			1545	1432
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	166	2248	68	0	1763	35	99	48	6	13	4	143
RTOR Reduction (vph)	0	2	0	0	1	0	0	3	0	0	0	0
Lane Group Flow (vph)	166	2314	0	0	1797	0	99	51	0	0	17	143
Confl. Peds. (#/hr)			32			12	48					48
Turn Type	Prot	NA			NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	16.6	79.2			57.6		17.7	17.7			17.7	17.7
Effective Green, g (s)	16.6	79.2			57.6		17.7	17.7			17.7	17.7
Actuated g/C Ratio	0.16	0.74			0.54		0.17	0.17			0.17	0.17
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	274	3743			2730		210	303			255	237
v/s Ratio Prot	0.09	c0.46			c0.35			0.03				
v/s Ratio Perm							0.08				0.01	c0.10
v/c Ratio	0.61	0.62			0.66		0.47	0.17			0.07	0.60
Uniform Delay, d1	42.1	6.6			17.6		40.4	38.3			37.6	41.3
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.8	0.3			0.6		1.7	0.3			0.1	4.3
Delay (s)	45.9	6.9			18.2		42.0	38.5			37.7	45.6
Level of Service	D	A			B		D	D			D	D
Approach Delay (s)		9.5			18.2			40.8			44.8	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	106.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: Cooke St & Ala Moana Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (vph)	106	1765	35	10	1664	18	25	15	4	21	24	62
Future Volume (vph)	106	1765	35	10	1664	18	25	15	4	21	24	62
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1770	5067		1770	5075			1793	1545		1810	1545
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.83	1.00
Satd. Flow (perm)	1770	5067		1770	5075			1448	1545		1540	1545
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	107	1783	35	10	1681	18	25	15	4	21	24	63
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	4	0	0	58
Lane Group Flow (vph)	107	1817	0	10	1698	0	0	40	0	0	45	5
Confl. Peds. (#/hr)			16			10	9		9	9		9
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	11.0	61.1		1.0	51.1			6.6	6.6		6.6	6.6
Effective Green, g (s)	11.0	61.1		1.0	51.1			6.6	6.6		6.6	6.6
Actuated g/C Ratio	0.13	0.73		0.01	0.61			0.08	0.08		0.08	0.08
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	232	3698		21	3098			114	121		121	121
v/s Ratio Prot	c0.06	c0.36		0.01	c0.33							
v/s Ratio Perm								0.03	0.00		c0.03	0.00
v/c Ratio	0.46	0.49		0.48	0.55			0.35	0.00		0.37	0.04
Uniform Delay, d1	33.6	4.8		41.1	9.5			36.5	35.5		36.6	35.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	0.1		16.0	0.2			1.9	0.0		1.9	0.1
Delay (s)	35.1	4.9		57.1	9.7			38.4	35.5		38.5	35.8
Level of Service	D	A		E	A			D	D		D	D
Approach Delay (s)		6.5			10.0			38.1			36.9	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	83.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: Cooke St & Ala Moana Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (vph)	54	2085	32	6	1468	47	43	41	17	40	37	97
Future Volume (vph)	54	2085	32	6	1468	47	43	41	17	40	37	97
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.97	1.00
Satd. Flow (prot)	1770	5070		1770	5050			1792	1546		1806	1518
Flt Permitted	0.95	1.00		0.95	1.00			0.80	1.00		0.79	1.00
Satd. Flow (perm)	1770	5070		1770	5050			1464	1546		1465	1518
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)	56	2172	33	6	1529	49	45	43	18	42	39	101
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	16	0	0	89
Lane Group Flow (vph)	56	2204	0	6	1576	0	0	88	2	0	81	12
Confl. Peds. (#/hr)			26			21	18		7	7		18
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	7.6	70.7		0.9	64.0			12.0	12.0		12.0	12.0
Effective Green, g (s)	7.6	70.7		0.9	64.0			12.0	12.0		12.0	12.0
Actuated g/C Ratio	0.08	0.72		0.01	0.65			0.12	0.12		0.12	0.12
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	136	3635		16	3277			178	188		178	184
v/s Ratio Prot	c0.03	c0.43		0.00	0.31							
v/s Ratio Perm								c0.06	0.00		0.06	0.01
v/c Ratio	0.41	0.61		0.38	0.48			0.49	0.01		0.46	0.07
Uniform Delay, d1	43.4	7.0		48.6	8.8			40.5	38.1		40.3	38.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	0.3		14.1	0.1			2.2	0.0		1.8	0.2
Delay (s)	45.4	7.3		62.7	8.9			42.6	38.1		42.1	38.5
Level of Service	D	A		E	A			D	D		D	D
Approach Delay (s)		8.2			9.1			41.9			40.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	98.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	48	77	68	22	19
Future Volume (Veh/h)	11	48	77	68	22	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	13	56	90	79	26	22
Pedestrians		13	9		7	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		1	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	176				228	150
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	176				228	150
tC, single (s)	4.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				*2.5	*2.3
p0 queue free %	99				98	98
cM capacity (veh/h)	1391				1080	1297

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	69	169	48
Volume Left	13	0	26
Volume Right	0	79	22
cSH	1391	1700	1170
Volume to Capacity	0.01	0.10	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	1.5	0.0	8.2
Lane LOS	A		A
Approach Delay (s)	1.5	0.0	8.2
Approach LOS			A

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	25.5%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
12: Ilalo St & Coral St
7/8/2015

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	143	130	38	47	14
Future Volume (Veh/h)	15	143	130	38	47	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	19	186	169	49	61	18
Pedestrians		18	15		11	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		2	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	229				444	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	229				444	222
tC, single (s)	4.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				*2.5	*2.3
p0 queue free %	99				93	98
cM capacity (veh/h)	1325				827	1184

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	205	218	79
Volume Left	19	0	61
Volume Right	0	49	18
cSH	1325	1700	888
Volume to Capacity	0.01	0.13	0.09
Queue Length 95th (ft)	1	0	7
Control Delay (s)	0.8	0.0	9.4
Lane LOS	A		A
Approach Delay (s)	0.8	0.0	9.4
Approach LOS			A

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Signalized Intersection Capacity Analysis
13: Coral St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (vph)	39	1897	83	19	1684	48	11	7	3	18	30	13
Future Volume (vph)	39	1897	83	19	1684	48	11	7	3	18	30	13
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.96	1.00		0.99	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1770	5034		1770	5057			1734	1533		1815	1454
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.87	1.00
Satd. Flow (perm)	1770	5034		1770	5057			1403	1533		1607	1454
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	39	1916	84	19	1701	48	11	7	3	18	30	13
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	3	0	0	12
Lane Group Flow (vph)	39	1997	0	19	1747	0	0	18	0	0	48	1
Confl. Peds. (#/hr)			30			15	50		14	14		50
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	4.6	61.3		2.4	59.1			6.7	6.7		6.7	6.7
Effective Green, g (s)	4.6	61.3		2.4	59.1			6.7	6.7		6.7	6.7
Actuated g/C Ratio	0.05	0.72		0.03	0.69			0.08	0.08		0.08	0.08
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	95	3613		49	3499			110	120		126	114
v/s Ratio Prot	c0.02	c0.40		0.01	0.35							
v/s Ratio Perm								0.01	0.00		c0.03	0.00
v/c Ratio	0.41	0.55		0.39	0.50			0.16	0.00		0.38	0.01
Uniform Delay, d1	39.1	5.6		40.8	6.2			36.7	36.3		37.4	36.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.9	0.2		5.0	0.1			0.7	0.0		1.9	0.0
Delay (s)	42.0	5.8		45.8	6.3			37.4	36.3		39.3	36.3
Level of Service	D	A		D	A			D	D		D	D
Approach Delay (s)		6.5			6.7			37.3			38.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	85.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: Coral St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (vph)	26	2117	38	8	1569	38	60	32	36	18	10	32
Future Volume (vph)	26	2117	38	8	1569	38	60	32	36	18	10	32
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.91
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.95	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5062		1770	5056			1708	1548		1793	1434
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.79	1.00
Satd. Flow (perm)	1770	5062		1770	5056			1384	1548		1467	1434
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)	27	2205	40	8	1634	40	62	33	38	19	10	33
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	33	0	0	29
Lane Group Flow (vph)	27	2244	0	8	1672	0	0	96	5	0	29	4
Confl. Peds. (#/hr)			31			26	48		6	6		48
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	4.2	75.0		1.0	71.8			13.6	13.6		13.6	13.6
Effective Green, g (s)	4.2	75.0		1.0	71.8			13.6	13.6		13.6	13.6
Actuated g/C Ratio	0.04	0.72		0.01	0.69			0.13	0.13		0.13	0.13
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	71	3629		16	3470			179	201		190	186
v/s Ratio Prot	c0.02	c0.44		0.00	0.33							
v/s Ratio Perm								c0.07	0.00		0.02	0.00
v/c Ratio	0.38	0.62		0.50	0.48			0.54	0.02		0.15	0.02
Uniform Delay, d1	48.9	7.5		51.6	7.7			42.6	39.7		40.4	39.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.3		22.5	0.1			3.1	0.0		0.4	0.1
Delay (s)	52.3	7.8		74.1	7.8			45.6	39.8		40.8	39.8
Level of Service	D	A		E	A			D	D		D	D
Approach Delay (s)		8.4			8.1			44.0			40.2	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	104.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
15: Keawe St & Ilalo St

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	0	41	6	13	67	15	6	2	2	16	5	6
Future Volume (Veh/h)	0	41	6	13	67	15	6	2	2	16	5	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	46	7	15	75	17	7	2	2	18	6	7
Pedestrians		9			9			59			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			1			6			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	102			112			241	240	118	185	236	102
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	102			112			241	240	118	185	236	102
tC, single (s)	4.1			4.1			*6.1	*5.5	*5.2	*6.1	*5.5	*5.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			*2.5	*3.0	*2.3	*2.5	*3.0	*2.3
p0 queue free %	100			99			99	100	100	98	99	99
cM capacity (veh/h)	1476			1395			907	848	1283	1035	853	1369

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	53	107	11	31
Volume Left	0	15	7	18
Volume Right	7	17	2	7
cSH	1476	1395	946	1049
Volume to Capacity	0.00	0.01	0.01	0.03
Queue Length 95th (ft)	0	1	1	2
Control Delay (s)	0.0	1.1	8.9	8.5
Lane LOS		A	A	A
Approach Delay (s)	0.0	1.1	8.9	8.5
Approach LOS			A	A

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
15: Keawe St & Ilalo St

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	15	99	14	13	114	17	6	23	20	39	8	4
Future Volume (Veh/h)	15	99	14	13	114	17	6	23	20	39	8	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	20	134	19	18	154	23	8	31	27	53	11	5
Pedestrians		3			4			33			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			3			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	179			186			432	432	180	434	430	170
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	179			186			432	432	180	434	430	170
tC, single (s)	4.1			4.1			*6.1	*5.5	*5.2	*6.1	*5.5	*5.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			*2.5	*3.0	*2.3	*2.5	*3.0	*2.3
p0 queue free %	99			99			99	96	98	93	98	100
cM capacity (veh/h)	1394			1345			728	695	1232	717	696	1285

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	173	195	66	69
Volume Left	20	18	8	53
Volume Right	19	23	27	5
cSH	1394	1345	851	737
Volume to Capacity	0.01	0.01	0.08	0.09
Queue Length 95th (ft)	1	1	6	8
Control Delay (s)	1.0	0.8	9.6	10.4
Lane LOS	A	A	A	B
Approach Delay (s)	1.0	0.8	9.6	10.4
Approach LOS			A	B

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			✣			✣	
Traffic Volume (vph)	60	2001	33	6	1682	20	5	0	10	8	3	46
Future Volume (vph)	60	2001	33	6	1682	20	5	0	10	8	3	46
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.98			0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.91			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1770	5067		1770	5072			1628			1590	
Flt Permitted	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (perm)	1770	5067		1770	5072			1628			1590	
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)	62	2084	34	6	1752	21	5	0	10	8	3	48
RTOR Reduction (vph)	0	1	0	0	1	0	0	15	0	0	45	0
Lane Group Flow (vph)	63	2117	0	6	1772	0	0	0	0	0	14	0
Confl. Peds. (#/hr)			21			21			15	15		20
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		3	3	
Permitted Phases												
Actuated Green, G (s)	7.4	66.6		0.7	59.9			1.7			5.4	
Effective Green, g (s)	7.4	66.6		0.7	59.9			1.7			5.4	
Actuated g/C Ratio	0.08	0.71		0.01	0.63			0.02			0.06	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	138	3574		13	3218			29			90	
v/s Ratio Prot	c0.04	c0.42		0.00	0.35			c0.00			c0.01	
v/s Ratio Perm												
v/c Ratio	0.46	0.59		0.46	0.55			0.01			0.15	
Uniform Delay, d1	41.6	7.0		46.7	9.7			45.5			42.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.4	0.3		23.8	0.2			0.1			0.8	
Delay (s)	44.0	7.3		70.4	9.9			45.7			43.1	
Level of Service	D	A		E	A			D			D	
Approach Delay (s)		8.4			10.1			45.7			43.1	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	94.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			✣			✣	
Traffic Volume (vph)	35	2151	36	2	1650	9	47	10	20	10	2	65
Future Volume (vph)	35	2151	36	2	1650	9	47	10	20	10	2	65
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.96			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1770	5061		1770	5080			1743			1596	
Flt Permitted	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (perm)	1770	5061		1770	5080			1743			1596	
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)	36	2241	38	2	1719	9	49	10	21	10	2	68
RTOR Reduction (vph)	0	1	0	0	0	0	0	9	0	0	64	0
Lane Group Flow (vph)	36	2278	0	2	1728	0	0	71	0	0	16	0
Confl. Peds. (#/hr)			36			4						10
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases												
Actuated Green, G (s)	4.4	77.9		0.8	74.3			10.3			7.3	
Effective Green, g (s)	4.4	77.9		0.8	74.3			10.3			7.3	
Actuated g/C Ratio	0.04	0.67		0.01	0.64			0.09			0.06	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	66	3389		12	3245			154			100	
v/s Ratio Prot	c0.02	c0.45		0.00	0.34			c0.04			c0.01	
v/s Ratio Perm												
v/c Ratio	0.55	0.67		0.17	0.53			0.46			0.16	
Uniform Delay, d1	55.0	11.5		57.4	11.5			50.4			51.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.9	0.5		6.5	0.2			2.2			0.8	
Delay (s)	63.9	12.1		63.9	11.7			52.5			52.4	
Level of Service	E	B		E	B			D			D	
Approach Delay (s)		12.9			11.7			52.5			52.4	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	116.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2018 PEAK PERIOD TRAFFIC
ANALYSIS WITHOUT PROJECT

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	5	22	30	5	83	43
Future Volume (vph)	5	22	30	5	83	43
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	6	28	38	6	105	54

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	34	25	19	105	54
Volume Left (vph)	6	0	0	105	0
Volume Right (vph)	28	0	6	0	0
Hadj (s)	-0.42	0.03	-0.19	0.53	0.03
Departure Headway (s)	3.9	4.7	4.5	5.1	4.6
Degree Utilization, x	0.04	0.03	0.02	0.15	0.07
Capacity (veh/h)	868	743	780	685	760
Control Delay (s)	7.1	6.7	6.4	7.8	6.8
Approach Delay (s)	7.1	6.6		7.5	
Approach LOS	A	A		A	

Intersection Summary			
Delay	7.3		
Level of Service	A		
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Ilalo St & Forrest Ave

7/8/2015

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	3	145	11	5	61	8
Future Volume (vph)	3	145	11	5	61	8
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	4	181	14	6	76	10

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	185	9	11	76	10
Volume Left (vph)	4	0	0	76	0
Volume Right (vph)	181	0	6	0	0
Hadj (s)	-0.55	0.03	-0.36	0.53	0.03
Departure Headway (s)	3.6	5.0	4.6	5.4	4.9
Degree Utilization, x	0.19	0.01	0.01	0.11	0.01
Capacity (veh/h)	965	686	742	634	699
Control Delay (s)	7.5	6.9	6.5	7.9	6.8
Approach Delay (s)	7.5	6.6		7.8	
Approach LOS	A	A		A	

Intersection Summary			
Delay	7.5		
Level of Service	A		
Intersection Capacity Utilization	25.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Cooke St & Ilalo St

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	46	12	23	121	24	1	16	8	25	21	28
Future Volume (vph)	14	46	12	23	121	24	1	16	8	25	21	28
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	16	54	14	27	142	28	1	19	9	29	25	33

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	84	197	29	54	33
Volume Left (vph)	16	27	1	29	0
Volume Right (vph)	14	28	9	0	33
Hadj (s)	-0.03	-0.02	-0.15	0.30	-0.67
Departure Headway (s)	4.4	4.3	4.6	5.5	4.5
Degree Utilization, x	0.10	0.23	0.04	0.08	0.04
Capacity (veh/h)	792	812	726	619	749
Control Delay (s)	7.9	8.5	7.8	7.8	6.5
Approach Delay (s)	7.9	8.5	7.8	7.3	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	32.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Cooke St & Ilalo St

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			↰↑	↱
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	35	137	21	15	133	21	19	24	18	14	33	22
Future Volume (vph)	35	137	21	15	133	21	19	24	18	14	33	22
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	47	185	28	20	180	28	26	32	24	19	45	30

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	260	228	82	64	30
Volume Left (vph)	47	20	26	19	0
Volume Right (vph)	28	28	24	0	30
Hadj (s)	0.01	-0.02	-0.08	0.18	-0.67
Departure Headway (s)	4.7	4.7	5.3	6.0	5.1
Degree Utilization, x	0.34	0.30	0.12	0.11	0.04
Capacity (veh/h)	731	731	618	549	635
Control Delay (s)	10.0	9.6	9.0	8.5	7.1
Approach Delay (s)	10.0	9.6	9.0	8.0	
Approach LOS	B	A	A	A	

Intersection Summary			
Delay	9.5		
Level of Service	A		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
8: Forrest Ave/South St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱			↑↑↱		↰	↱			↰↑	↱
Traffic Volume (vph)	217	2180	140	0	1763	45	33	19	1	7	15	32
Future Volume (vph)	217	2180	140	0	1763	45	33	19	1	7	15	32
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	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	0.90
Flpb, ped/bikes	1.00	1.00			1.00		0.91	1.00			1.00	1.00
Frt	1.00	0.99			1.00		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	5030			5064		1615	1849			1834	1425
Flt Permitted	0.95	1.00			1.00		0.74	1.00			0.89	1.00
Satd. Flow (perm)	1770	5030			5064		1263	1849			1658	1425
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	224	2247	144	0	1818	46	34	20	1	7	15	33
RTOR Reduction (vph)	0	4	0	0	2	0	0	1	0	0	0	0
Lane Group Flow (vph)	224	2387	0	0	1862	0	34	20	0	0	22	33
Confl. Peds. (#/hr)			11			3	53					53
Turn Type	Prot	NA			NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	19.9	84.6			59.7		7.2	7.2			7.2	7.2
Effective Green, g (s)	19.9	84.6			59.7		7.2	7.2			7.2	7.2
Actuated g/C Ratio	0.20	0.83			0.59		0.07	0.07			0.07	0.07
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	346	4180			2969		89	130			117	100
v/s Ratio Prot	c0.13	0.47			c0.37			0.01				
v/s Ratio Perm							c0.03				0.01	0.02
v/c Ratio	0.65	0.57			0.63		0.38	0.15			0.19	0.33
Uniform Delay, d1	37.7	2.8			13.8		45.2	44.4			44.5	45.0
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	4.1	0.2			0.4		2.7	0.6			0.8	1.9
Delay (s)	41.9	3.0			14.2		47.9	45.0			45.3	46.9
Level of Service	D	A			B		D	D			D	D
Approach Delay (s)		6.3			14.2			46.8			46.3	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	101.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Forrest Ave/South St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱			↑↑↱		↰	↱			↰↑	↱
Traffic Volume (vph)	163	2302	67	0	1794	34	97	47	6	13	4	140
Future Volume (vph)	163	2302	67	0	1794	34	97	47	6	13	4	140
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	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	0.90
Flpb, ped/bikes	1.00	1.00			1.00		0.91	1.00			1.00	1.00
Frt	1.00	1.00			1.00		1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5054			5068		1612	1832			1794	1423
Flt Permitted	0.95	1.00			1.00		0.75	1.00			0.83	1.00
Satd. Flow (perm)	1770	5054			5068		1266	1832			1543	1423
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	166	2349	68	0	1831	35	99	48	6	13	4	143
RTOR Reduction (vph)	0	2	0	0	1	0	0	3	0	0	0	0
Lane Group Flow (vph)	166	2415	0	0	1865	0	99	51	0	0	17	143
Confl. Peds. (#/hr)			32			12	48					48
Turn Type	Prot	NA			NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	17.0	86.0			64.0		18.2	18.2			18.2	18.2
Effective Green, g (s)	17.0	86.0			64.0		18.2	18.2			18.2	18.2
Actuated g/C Ratio	0.15	0.75			0.56		0.16	0.16			0.16	0.16
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	263	3805			2840		201	291			245	226
v/s Ratio Prot	0.09	c0.48			0.37			0.03				
v/s Ratio Perm							0.08				0.01	c0.10
v/c Ratio	0.63	0.63			0.66		0.49	0.17			0.07	0.63
Uniform Delay, d1	45.7	6.7			17.5		43.8	41.5			40.8	44.9
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	4.9	0.4			0.6		1.9	0.3			0.1	5.7
Delay (s)	50.5	7.0			18.0		45.7	41.8			40.9	50.6
Level of Service	D	A			B		D	D			D	D
Approach Delay (s)		9.8			18.0			44.3			49.5	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	114.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: Cooke St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (vph)	106	1859	35	10	1739	18	25	15	4	21	24	62
Future Volume (vph)	106	1859	35	10	1739	18	25	15	4	21	24	62
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1770	5068		1770	5075			1792	1544		1810	1544
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.83	1.00
Satd. Flow (perm)	1770	5068		1770	5075			1448	1544		1539	1544
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	107	1878	35	10	1757	18	25	15	4	21	24	63
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	4	0	0	58
Lane Group Flow (vph)	107	1912	0	10	1774	0	0	40	0	0	45	5
Confl. Peds. (#/hr)			16			10	9		9	9		9
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	11.3	65.0		1.0	54.7			6.7	6.7		6.7	6.7
Effective Green, g (s)	11.3	65.0		1.0	54.7			6.7	6.7		6.7	6.7
Actuated g/C Ratio	0.13	0.74		0.01	0.62			0.08	0.08		0.08	0.08
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	228	3756		20	3165			110	117		117	117
v/s Ratio Prot	c0.06	c0.38		0.01	c0.35							
v/s Ratio Perm								0.03	0.00		c0.03	0.00
v/c Ratio	0.47	0.51		0.50	0.56			0.36	0.00		0.38	0.04
Uniform Delay, d1	35.4	4.7		43.1	9.5			38.5	37.4		38.5	37.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	0.1		18.3	0.2			2.0	0.0		2.1	0.1
Delay (s)	36.9	4.8		61.4	9.8			40.5	37.4		40.6	37.7
Level of Service	D	A		E	A			D	D		D	D
Approach Delay (s)		6.5			10.1			40.2			38.9	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	87.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: Cooke St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	2184	32	6	1534	47	43	41	17	40	37	97
Future Volume (vph)	54	2184	32	6	1534	47	43	41	17	40	37	97
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.97	1.00
Satd. Flow (prot)	1770	5070		1770	5051			1790	1545		1805	1515
Flt Permitted	0.95	1.00		0.95	1.00			0.80	1.00		0.79	1.00
Satd. Flow (perm)	1770	5070		1770	5051			1462	1545		1465	1515
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)	56	2275	33	6	1598	49	45	43	18	42	39	101
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	16	0	0	89
Lane Group Flow (vph)	56	2307	0	6	1645	0	0	88	2	0	81	12
Confl. Peds. (#/hr)			26			21	18		7	7		18
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	7.7	76.8		1.0	70.1			12.4	12.4		12.4	12.4
Effective Green, g (s)	7.7	76.8		1.0	70.1			12.4	12.4		12.4	12.4
Actuated g/C Ratio	0.07	0.73		0.01	0.67			0.12	0.12		0.12	0.12
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	129	3701		16	3365			172	182		172	178
v/s Ratio Prot	c0.03	c0.46		0.00	0.33							
v/s Ratio Perm								c0.06	0.00		0.06	0.01
v/c Ratio	0.43	0.62		0.38	0.49			0.51	0.01		0.47	0.07
Uniform Delay, d1	46.7	7.0		51.8	8.7			43.6	41.0		43.3	41.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.3	0.3		14.1	0.1			2.6	0.0		2.0	0.2
Delay (s)	49.0	7.4		65.9	8.8			46.1	41.0		45.4	41.4
Level of Service	D	A		E	A			D	D		D	D
Approach Delay (s)		8.4			9.0			45.2			43.2	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	105.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
12: Ilalo St & Coral St

7/8/2015

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	50	82	68	22	19
Future Volume (Veh/h)	11	50	82	68	22	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	13	58	95	79	26	22
Pedestrians		13	9		7	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		1	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	181				234	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	181				234	154
tC, single (s)	4.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				*2.5	*2.3
p0 queue free %	99				98	98
cM capacity (veh/h)	1385				1071	1290

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	71	174	48
Volume Left	13	0	26
Volume Right	0	79	22
cSH	1385	1700	1161
Volume to Capacity	0.01	0.10	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	1.5	0.0	8.2
Lane LOS	A		A
Approach Delay (s)	1.5	0.0	8.2
Approach LOS			A

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
12: Ilalo St & Coral St

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	146	136	38	47	14
Future Volume (Veh/h)	15	146	136	38	47	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	19	190	177	49	61	18
Pedestrians		18	15		11	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		2	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	237				456	230
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	237				456	230
tC, single (s)	4.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				*2.5	*2.3
p0 queue free %	99				93	98
cM capacity (veh/h)	1316				815	1173

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	209	226	79
Volume Left	19	0	61
Volume Right	0	49	18
cSH	1316	1700	876
Volume to Capacity	0.01	0.13	0.09
Queue Length 95th (ft)	1	0	7
Control Delay (s)	0.8	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	0.8	0.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Signalized Intersection Capacity Analysis
13: Coral St & Ala Moana Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	1991	83	19	1759	48	11	7	3	18	30	13
Future Volume (vph)	39	1991	83	19	1759	48	11	7	3	18	30	13
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.91
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.96	1.00		0.99	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1770	5035		1770	5058			1728	1531		1814	1445
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.87	1.00
Satd. Flow (perm)	1770	5035		1770	5058			1398	1531		1606	1445
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	39	2011	84	19	1777	48	11	7	3	18	30	13
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	3	0	0	12
Lane Group Flow (vph)	39	2092	0	19	1823	0	0	18	0	0	48	1
Confl. Peds. (#/hr)			30			15	50		14	14		50
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	4.7	67.8		2.5	65.6			6.9	6.9		6.9	6.9
Effective Green, g (s)	4.7	67.8		2.5	65.6			6.9	6.9		6.9	6.9
Actuated g/C Ratio	0.05	0.74		0.03	0.71			0.07	0.07		0.07	0.07
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	90	3702		47	3598			104	114		120	108
v/s Ratio Prot	c0.02	c0.42		0.01	0.36							
v/s Ratio Perm								0.01	0.00		c0.03	0.00
v/c Ratio	0.43	0.57		0.40	0.51			0.17	0.00		0.40	0.01
Uniform Delay, d1	42.5	5.5		44.1	6.0			40.0	39.5		40.7	39.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.3	0.2		5.6	0.1			0.8	0.0		2.2	0.0
Delay (s)	45.8	5.7		49.7	6.1			40.8	39.5		42.9	39.5
Level of Service	D	A		D	A			D	D		D	D
Approach Delay (s)		6.5			6.6			40.6			42.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	92.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: Coral St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (vph)	26	2216	38	8	1635	38	60	32	36	18	10	32
Future Volume (vph)	26	2216	38	8	1635	38	60	32	36	18	10	32
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.90
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.94	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5062		1770	5056			1702	1547		1792	1426
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.79	1.00
Satd. Flow (perm)	1770	5062		1770	5056			1379	1547		1465	1426
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)	27	2308	40	8	1703	40	62	33	38	19	10	33
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	33	0	0	29
Lane Group Flow (vph)	27	2347	0	8	1742	0	0	96	5	0	29	4
Confl. Peds. (#/hr)			31			26	48		6	6		48
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	4.2	81.4		1.1	78.3			14.0	14.0		14.0	14.0
Effective Green, g (s)	4.2	81.4		1.1	78.3			14.0	14.0		14.0	14.0
Actuated g/C Ratio	0.04	0.73		0.01	0.70			0.13	0.13		0.13	0.13
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	66	3695		17	3550			173	194		183	179
v/s Ratio Prot	c0.02	c0.46		0.00	0.34							
v/s Ratio Perm								c0.07	0.00		0.02	0.00
v/c Ratio	0.41	0.64		0.47	0.49			0.55	0.02		0.16	0.02
Uniform Delay, d1	52.4	7.6		54.9	7.5			45.8	42.8		43.5	42.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.1	0.4		19.2	0.1			3.8	0.1		0.4	0.1
Delay (s)	56.5	7.9		74.1	7.6			49.6	42.8		43.9	42.8
Level of Service	E	A		E	A			D	D		D	D
Approach Delay (s)		8.5			8.0			47.7			43.3	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	111.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
15: Keawe St & Ilalo St

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	0	43	6	13	72	15	6	2	2	16	5	6
Future Volume (Veh/h)	0	43	6	13	72	15	6	2	2	16	5	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	48	7	15	81	17	7	2	2	18	6	7
Pedestrians		9			9			59			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			1			6			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	108			114			249	248	120	193	244	108
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	108			114			249	248	120	193	244	108
tC, single (s)	4.1			4.1			*6.1	*5.5	*5.2	*6.1	*5.5	*5.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			*2.5	*3.0	*2.3	*2.5	*3.0	*2.3
p0 queue free %	100			99			99	100	100	98	99	99
cM capacity (veh/h)	1469			1392			897	840	1280	1023	845	1360

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	55	113	11	31
Volume Left	0	15	7	18
Volume Right	7	17	2	7
cSH	1469	1392	937	1039
Volume to Capacity	0.00	0.01	0.01	0.03
Queue Length 95th (ft)	0	1	1	2
Control Delay (s)	0.0	1.1	8.9	8.6
Lane LOS		A	A	A
Approach Delay (s)	0.0	1.1	8.9	8.6
Approach LOS			A	A

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	25.1%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
15: Keawe St & Ilalo St

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	15	102	14	13	120	17	6	23	20	39	8	4
Future Volume (Veh/h)	15	102	14	13	120	17	6	23	20	39	8	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	20	138	19	18	162	23	8	31	27	53	11	5
Pedestrians		3			4			33			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			3			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	187			190			444	444	184	446	442	178
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	187			190			444	444	184	446	442	178
tC, single (s)	4.1			4.1			*6.1	*5.5	*5.2	*6.1	*5.5	*5.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			*2.5	*3.0	*2.3	*2.5	*3.0	*2.3
p0 queue free %	99			99			99	95	98	92	98	100
cM capacity (veh/h)	1385			1340			716	685	1226	705	687	1274

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	177	203	66	69
Volume Left	20	18	8	53
Volume Right	19	23	27	5
cSH	1385	1340	841	726
Volume to Capacity	0.01	0.01	0.08	0.10
Queue Length 95th (ft)	1	1	6	8
Control Delay (s)	1.0	0.8	9.6	10.5
Lane LOS	A	A	A	B
Approach Delay (s)	1.0	0.8	9.6	10.5
Approach LOS			A	B

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	28.9%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Signalized Intersection Capacity Analysis
16: Keawe St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			✥			✥	
Traffic Volume (vph)	60	2095	33	6	1757	20	5	0	10	8	3	46
Future Volume (vph)	60	2095	33	6	1757	20	5	0	10	8	3	46
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.98			0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.91			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1770	5068		1770	5072			1627			1588	
Flt Permitted	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (perm)	1770	5068		1770	5072			1627			1588	
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)	62	2182	34	6	1830	21	5	0	10	8	3	48
RTOR Reduction (vph)	0	1	0	0	1	0	0	15	0	0	45	0
Lane Group Flow (vph)	63	2215	0	6	1850	0	0	0	0	0	14	0
Confl. Peds. (#/hr)			21			21			15	15		20
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		3	3	
Permitted Phases												
Actuated Green, G (s)	7.6	70.3		0.7	63.4			1.7			5.4	
Effective Green, g (s)	7.6	70.3		0.7	63.4			1.7			5.4	
Actuated g/C Ratio	0.08	0.72		0.01	0.65			0.02			0.06	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	137	3631		12	3277			28			87	
v/s Ratio Prot	c0.04	c0.44		0.00	0.36			c0.00			c0.01	
v/s Ratio Perm												
v/c Ratio	0.46	0.61		0.50	0.56			0.01			0.16	
Uniform Delay, d1	43.3	7.0		48.5	9.7			47.4			44.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.4	0.3		29.2	0.2			0.1			0.8	
Delay (s)	45.7	7.3		77.7	9.9			47.5			45.0	
Level of Service	D	A		E	A			D			D	
Approach Delay (s)		8.4			10.1			47.5			45.0	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	98.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Keawe St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			✥			✥	
Traffic Volume (vph)	35	2250	36	2	1716	9	47	10	20	10	2	65
Future Volume (vph)	35	2250	36	2	1716	9	47	10	20	10	2	65
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.96			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1770	5061		1770	5081			1743			1593	
Flt Permitted	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (perm)	1770	5061		1770	5081			1743			1593	
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)	36	2344	38	2	1788	9	49	10	21	10	2	68
RTOR Reduction (vph)	0	1	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	36	2381	0	2	1797	0	0	71	0	0	80	0
Confl. Peds. (#/hr)			36			4						10
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases												
Actuated Green, G (s)	4.4	84.2		0.8	80.6			10.5			11.8	
Effective Green, g (s)	4.4	84.2		0.8	80.6			10.5			11.8	
Actuated g/C Ratio	0.03	0.66		0.01	0.63			0.08			0.09	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	61	3347		11	3217			143			147	
v/s Ratio Prot	c0.02	c0.47		0.00	0.35			c0.04			c0.05	
v/s Ratio Perm												
v/c Ratio	0.59	0.71		0.18	0.56			0.50			0.54	
Uniform Delay, d1	60.6	13.8		62.9	13.3			55.9			55.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	14.4	0.7		7.8	0.2			2.7			4.1	
Delay (s)	74.9	14.5		70.8	13.5			58.6			59.3	
Level of Service	E	B		E	B			E			E	
Approach Delay (s)		15.4			13.5			58.6			59.3	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	127.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX E

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2018 PEAK PERIOD TRAFFIC
ANALYSIS WITH PROJECT

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	5	35	30	5	180	43
Future Volume (vph)	5	35	30	5	180	43
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	6	44	38	6	228	54

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	50	25	19	228	54
Volume Left (vph)	6	0	0	228	0
Volume Right (vph)	44	0	6	0	0
Hadj (s)	-0.47	0.03	-0.19	0.53	0.03
Departure Headway (s)	4.2	4.9	4.7	5.2	4.7
Degree Utilization, x	0.06	0.03	0.02	0.33	0.07
Capacity (veh/h)	793	717	751	680	752
Control Delay (s)	7.5	6.9	6.6	9.5	6.8
Approach Delay (s)	7.5	6.7		9.0	
Approach LOS	A	A		A	

Intersection Summary			
Delay	8.5		
Level of Service	A		
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	3	221	11	5	137	8
Future Volume (vph)	3	221	11	5	137	8
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	4	276	14	6	171	10

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	280	9	11	171	10
Volume Left (vph)	4	0	0	171	0
Volume Right (vph)	276	0	6	0	0
Hadj (s)	-0.55	0.03	-0.36	0.53	0.03
Departure Headway (s)	3.9	5.3	5.0	5.7	5.2
Degree Utilization, x	0.30	0.01	0.01	0.27	0.01
Capacity (veh/h)	889	629	675	605	662
Control Delay (s)	8.6	7.2	6.8	9.5	7.0
Approach Delay (s)	8.6	7.0		9.4	
Approach LOS	A	A		A	

Intersection Summary			
Delay	8.8		
Level of Service	A		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Cooke St & Ilalo St

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	47	12	23	127	24	1	16	8	25	21	54
Future Volume (vph)	21	47	12	23	127	24	1	16	8	25	21	54
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	25	55	14	27	149	28	1	19	9	29	25	64

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	94	204	29	54	64
Volume Left (vph)	25	27	1	29	0
Volume Right (vph)	14	28	9	0	64
Hadj (s)	0.00	-0.02	-0.15	0.30	-0.67
Departure Headway (s)	4.5	4.3	4.7	5.5	4.5
Degree Utilization, x	0.12	0.25	0.04	0.08	0.08
Capacity (veh/h)	769	793	709	613	741
Control Delay (s)	8.1	8.8	7.9	7.8	6.7
Approach Delay (s)	8.1	8.8	7.9	7.2	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Cooke St & Ilalo St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			↰	↱
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	81	145	21	15	138	21	19	24	18	14	33	42
Future Volume (vph)	81	145	21	15	138	21	19	24	18	14	33	42
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	109	196	28	20	186	28	26	32	24	19	45	57

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	333	234	82	64	57
Volume Left (vph)	109	20	26	19	0
Volume Right (vph)	28	28	24	0	57
Hadj (s)	0.05	-0.02	-0.08	0.18	-0.67
Departure Headway (s)	4.8	4.9	5.6	6.2	5.4
Degree Utilization, x	0.45	0.32	0.13	0.11	0.08
Capacity (veh/h)	711	698	568	524	603
Control Delay (s)	11.7	10.2	9.4	8.8	7.7
Approach Delay (s)	11.7	10.2	9.4	8.3	
Approach LOS	B	B	A	A	

Intersection Summary			
Delay	10.4		
Level of Service	B		
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
8: Forrest Ave/South St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱			↑↑↱		↰	↱			↰↑	↱
Traffic Volume (vph)	217	2180	228	0	1769	45	41	24	1	7	24	32
Future Volume (vph)	217	2180	228	0	1769	45	41	24	1	7	24	32
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	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	0.90
Flpb, ped/bikes	1.00	1.00			1.00		0.91	1.00			1.00	1.00
Frt	1.00	0.99			1.00		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1770	4998			5064		1611	1852			1843	1419
Flt Permitted	0.95	1.00			1.00		0.74	1.00			0.92	1.00
Satd. Flow (perm)	1770	4998			5064		1249	1852			1723	1419
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	224	2247	235	0	1824	46	42	25	1	7	25	33
RTOR Reduction (vph)	0	7	0	0	2	0	0	1	0	0	0	0
Lane Group Flow (vph)	224	2475	0	0	1868	0	42	25	0	0	32	33
Confl. Peds. (#/hr)			11			3	53					53
Turn Type	Prot	NA			NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	20.2	88.1			62.9		7.9	7.9			7.9	7.9
Effective Green, g (s)	20.2	88.1			62.9		7.9	7.9			7.9	7.9
Actuated g/C Ratio	0.19	0.83			0.59		0.07	0.07			0.07	0.07
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	337	4153			3004		93	138			128	105
v/s Ratio Prot	0.13	c0.50			c0.37			0.01				
v/s Ratio Perm							c0.03				0.02	0.02
v/c Ratio	0.66	0.60			0.62		0.45	0.18			0.25	0.31
Uniform Delay, d1	39.8	3.0			13.9		47.0	46.0			46.3	46.5
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	4.9	0.2			0.4		3.5	0.6			1.0	1.7
Delay (s)	44.6	3.2			14.3		50.4	46.7			47.3	48.2
Level of Service	D	A			B		D	D			D	D
Approach Delay (s)		6.7			14.3			49.0			47.8	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Forrest Ave/South St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱			↑↑↱		↰	↱			↰↑	↱
Traffic Volume (vph)	163	2302	139	0	1826	34	148	72	6	13	8	140
Future Volume (vph)	163	2302	139	0	1826	34	148	72	6	13	8	140
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	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	0.89
Flpb, ped/bikes	1.00	1.00			1.00		0.91	1.00			1.00	1.00
Frt	1.00	0.99			1.00		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	5020			5068		1602	1842			1807	1413
Flt Permitted	0.95	1.00			1.00		0.74	1.00			0.85	1.00
Satd. Flow (perm)	1770	5020			5068		1254	1842			1584	1413
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	166	2349	142	0	1863	35	151	73	6	13	8	143
RTOR Reduction (vph)	0	4	0	0	1	0	0	2	0	0	0	0
Lane Group Flow (vph)	166	2487	0	0	1897	0	151	77	0	0	21	143
Confl. Peds. (#/hr)			32			12	48					48
Turn Type	Prot	NA			NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	17.4	90.7			68.3		21.2	21.2			21.2	21.2
Effective Green, g (s)	17.4	90.7			68.3		21.2	21.2			21.2	21.2
Actuated g/C Ratio	0.14	0.74			0.56		0.17	0.17			0.17	0.17
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	252	3735			2839		218	320			275	245
v/s Ratio Prot	0.09	c0.50			0.37			0.04				
v/s Ratio Perm							c0.12				0.01	0.10
v/c Ratio	0.66	0.67			0.67		0.69	0.24			0.08	0.58
Uniform Delay, d1	49.4	7.9			18.8		47.3	43.4			42.2	46.3
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	6.1	0.5			0.6		9.1	0.4			0.1	3.5
Delay (s)	55.5	8.4			19.4		56.4	43.8			42.3	49.8
Level of Service	E	A			B		E	D			D	D
Approach Delay (s)		11.3			19.4			52.1			48.8	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	121.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (vph)	106	1873	35	31	1782	18	25	16	10	21	29	62
Future Volume (vph)	106	1873	35	31	1782	18	25	16	10	21	29	62
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1770	5068		1770	5076			1794	1544		1815	1544
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.84	1.00
Satd. Flow (perm)	1770	5068		1770	5076			1450	1544		1566	1544
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	107	1892	35	31	1800	18	25	16	10	21	29	63
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	9	0	0	58
Lane Group Flow (vph)	107	1926	0	31	1817	0	0	41	1	0	50	5
Confl. Peds. (#/hr)			16			10	9		9	9		9
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	11.5	62.8		4.4	55.7			7.0	7.0		7.0	7.0
Effective Green, g (s)	11.5	62.8		4.4	55.7			7.0	7.0		7.0	7.0
Actuated g/C Ratio	0.13	0.70		0.05	0.62			0.08	0.08		0.08	0.08
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	228	3568		87	3169			113	121		122	121
v/s Ratio Prot	c0.06	c0.38		0.02	c0.36							
v/s Ratio Perm								0.03	0.00		c0.03	0.00
v/c Ratio	0.47	0.54		0.36	0.57			0.36	0.01		0.41	0.04
Uniform Delay, d1	36.0	6.3		41.0	9.8			39.0	37.9		39.1	38.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	0.2		2.5	0.3			2.0	0.0		2.2	0.1
Delay (s)	37.5	6.5		43.5	10.1			41.0	37.9		41.4	38.1
Level of Service	D	A		D	B			D	D		D	D
Approach Delay (s)		8.1			10.6			40.4			39.6	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (vph)	54	2260	32	21	1564	47	43	49	55	40	42	97
Future Volume (vph)	54	2260	32	21	1564	47	43	49	55	40	42	97
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.98	1.00
Satd. Flow (prot)	1770	5070		1770	5050			1793	1543		1808	1509
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.74	1.00
Satd. Flow (perm)	1770	5070		1770	5050			1455	1543		1378	1509
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)	56	2354	33	22	1629	49	45	51	57	42	44	101
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	50	0	0	89
Lane Group Flow (vph)	56	2386	0	22	1676	0	0	96	7	0	86	12
Confl. Peds. (#/hr)			26			21	18		7	7		18
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	7.7	85.8		3.9	82.0			13.6	13.6		13.6	13.6
Effective Green, g (s)	7.7	85.8		3.9	82.0			13.6	13.6		13.6	13.6
Actuated g/C Ratio	0.07	0.73		0.03	0.69			0.11	0.11		0.11	0.11
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	115	3677		58	3500			167	177		158	173
v/s Ratio Prot	c0.03	c0.47		0.01	0.33							
v/s Ratio Perm								c0.07	0.00		0.06	0.01
v/c Ratio	0.49	0.65		0.38	0.48			0.57	0.04		0.54	0.07
Uniform Delay, d1	53.4	8.4		56.0	8.3			49.6	46.5		49.4	46.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.2	0.4		4.1	0.1			4.7	0.1		3.8	0.2
Delay (s)	56.6	8.8		60.1	8.4			54.3	46.6		53.2	46.9
Level of Service	E	A		E	A			D	D		D	D
Approach Delay (s)		9.9			9.1			51.5			49.8	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	118.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	58	114	68	22	44
Future Volume (Veh/h)	19	58	114	68	22	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	22	67	133	79	26	51
Pedestrians		13	9		7	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		1	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	219				300	192
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	219				300	192
tC, single (s)	4.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				*2.5	*2.3
p0 queue free %	98				97	96
cM capacity (veh/h)	1341				986	1236

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	89	212	77
Volume Left	22	0	26
Volume Right	0	79	51
cSH	1341	1700	1138
Volume to Capacity	0.02	0.12	0.07
Queue Length 95th (ft)	1	0	5
Control Delay (s)	2.0	0.0	8.4
Lane LOS	A		A
Approach Delay (s)	2.0	0.0	8.4
Approach LOS			A

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	60	200	161	38	47	34
Future Volume (Veh/h)	60	200	161	38	47	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	78	260	209	49	61	44
Pedestrians		18	15		11	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		2	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	269				676	262
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	269				676	262
tC, single (s)	4.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				*2.5	*2.3
p0 queue free %	94				90	96
cM capacity (veh/h)	1281				600	1132

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	338	258	105
Volume Left	78	0	61
Volume Right	0	49	44
cSH	1281	1700	747
Volume to Capacity	0.06	0.15	0.14
Queue Length 95th (ft)	5	0	12
Control Delay (s)	2.3	0.0	10.6
Lane LOS	A		B
Approach Delay (s)	2.3	0.0	10.6
Approach LOS			B

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Signalized Intersection Capacity Analysis
13: Coral St & Ala Moana Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (vph)	39	1998	83	40	1781	48	11	8	10	18	34	13
Future Volume (vph)	39	1998	83	40	1781	48	11	8	10	18	34	13
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.91
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.96	1.00		0.99	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1770	5035		1770	5058			1731	1529		1817	1437
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.88	1.00
Satd. Flow (perm)	1770	5035		1770	5058			1410	1529		1622	1437
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	39	2018	84	40	1799	48	11	8	10	18	34	13
RTOR Reduction (vph)	0	2	0	0	1	0	0	0	9	0	0	12
Lane Group Flow (vph)	39	2100	0	40	1846	0	0	19	1	0	52	1
Confl. Peds. (#/hr)			30			15	50		14	14		50
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	4.8	71.3		4.8	71.3			7.1	7.1		7.1	7.1
Effective Green, g (s)	4.8	71.3		4.8	71.3			7.1	7.1		7.1	7.1
Actuated g/C Ratio	0.05	0.73		0.05	0.73			0.07	0.07		0.07	0.07
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	86	3655		86	3672			101	110		117	103
v/s Ratio Prot	0.02	c0.42		c0.02	0.36							
v/s Ratio Perm								0.01	0.00		c0.03	0.00
v/c Ratio	0.45	0.57		0.47	0.50			0.19	0.01		0.44	0.01
Uniform Delay, d1	45.4	6.3		45.5	5.8			42.8	42.3		43.7	42.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.8	0.2		3.9	0.1			0.9	0.0		2.7	0.0
Delay (s)	49.2	6.5		49.4	5.9			43.7	42.3		46.3	42.3
Level of Service	D	A		D	A			D	D		D	D
Approach Delay (s)		7.3			6.8			43.2			45.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	98.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: Coral St & Ala Moana Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (vph)	26	2254	38	23	1650	38	60	39	74	18	15	32
Future Volume (vph)	26	2254	38	23	1650	38	60	39	74	18	15	32
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.89
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.94	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5062		1770	5056			1706	1545		1804	1413
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.82	1.00
Satd. Flow (perm)	1770	5062		1770	5056			1396	1545		1515	1413
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)	27	2348	40	24	1719	40	62	41	77	19	16	33
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	67	0	0	29
Lane Group Flow (vph)	27	2387	0	24	1758	0	0	104	10	0	35	4
Confl. Peds. (#/hr)			31			26	48		6	6		48
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	4.0	87.7		4.0	87.7			15.2	15.2		15.2	15.2
Effective Green, g (s)	4.0	87.7		4.0	87.7			15.2	15.2		15.2	15.2
Actuated g/C Ratio	0.03	0.72		0.03	0.72			0.12	0.12		0.12	0.12
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	58	3641		58	3637			174	192		188	176
v/s Ratio Prot	c0.02	c0.47		0.01	0.35							
v/s Ratio Perm								c0.07	0.01		0.02	0.00
v/c Ratio	0.47	0.66		0.41	0.48			0.60	0.05		0.19	0.02
Uniform Delay, d1	57.9	9.1		57.8	7.4			50.5	47.0		47.8	46.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.8	0.4		4.7	0.1			5.4	0.1		0.5	0.1
Delay (s)	63.7	9.5		62.5	7.5			55.9	47.1		48.3	46.9
Level of Service	E	A		E	A			E	D		D	D
Approach Delay (s)		10.1			8.2			52.2			47.6	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	121.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	5	54	6	24	118	15	6	10	7	16	9	24
Future Volume (Veh/h)	5	54	6	24	118	15	6	10	7	16	9	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	6	61	7	27	133	17	7	11	8	18	10	27
Pedestrians		9			9			59			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			1			6			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	160			127			372	350	132	304	344	160
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	160			127			372	350	132	304	344	160
tC, single (s)	4.1			4.1			*6.1	*5.5	*5.2	*6.1	*5.5	*5.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			*2.5	*3.0	*2.3	*2.5	*3.0	*2.3
p0 queue free %	100			98			99	99	99	98	99	98
cM capacity (veh/h)	1406			1377			736	740	1261	859	744	1283

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	74	177	26	55
Volume Left	6	27	7	18
Volume Right	7	17	8	27
cSH	1406	1377	846	992
Volume to Capacity	0.00	0.02	0.03	0.06
Queue Length 95th (ft)	0	1	2	4
Control Delay (s)	0.6	1.3	9.4	8.8
Lane LOS	A	A	A	A
Approach Delay (s)	0.6	1.3	9.4	8.8
Approach LOS			A	A

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	42	171	14	22	156	17	6	66	50	39	11	16
Future Volume (Veh/h)	42	171	14	22	156	17	6	66	50	39	11	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	57	231	19	30	211	23	8	89	68	53	15	22
Pedestrians		3			4			33			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			3			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	236			283			702	684	278	756	682	228
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	236			283			702	684	278	756	682	228
tC, single (s)	4.1			4.1			*6.1	*5.5	*5.2	*6.1	*5.5	*5.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			*2.5	*3.0	*2.3	*2.5	*3.0	*2.3
p0 queue free %	96			98			98	82	94	86	97	98
cM capacity (veh/h)	1329			1239			475	500	1104	384	501	1205

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	307	264	165	90
Volume Left	57	30	8	53
Volume Right	19	23	68	22
cSH	1329	1239	644	484
Volume to Capacity	0.04	0.02	0.26	0.19
Queue Length 95th (ft)	3	2	25	17
Control Delay (s)	1.8	1.1	12.5	14.1
Lane LOS	A	A	B	B
Approach Delay (s)	1.8	1.1	12.5	14.1
Approach LOS			B	B

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Signalized Intersection Capacity Analysis
16: Keawe St & Ala Moana Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			✥			✥	
Traffic Volume (vph)	60	2095	33	28	1757	20	11	0	17	8	3	46
Future Volume (vph)	60	2095	33	28	1757	20	11	0	17	8	3	46
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.98			0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.92			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1770	5067		1770	5072			1636			1585	
Flt Permitted	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (perm)	1770	5067		1770	5072			1636			1585	
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)	62	2182	34	29	1830	21	11	0	18	8	3	48
RTOR Reduction (vph)	0	1	0	0	1	0	0	28	0	0	45	0
Lane Group Flow (vph)	63	2215	0	29	1850	0	0	1	0	0	14	0
Confl. Peds. (#/hr)			21			21			15	15		20
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		3	3	
Permitted Phases												
Actuated Green, G (s)	7.5	74.2		2.9	69.6			2.7			5.5	
Effective Green, g (s)	7.5	74.2		2.9	69.6			2.7			5.5	
Actuated g/C Ratio	0.07	0.70		0.03	0.66			0.03			0.05	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	126	3570		48	3352			41			82	
v/s Ratio Prot	c0.04	c0.44		0.02	0.36			c0.00			c0.01	
v/s Ratio Perm												
v/c Ratio	0.50	0.62		0.60	0.55			0.02			0.16	
Uniform Delay, d1	47.1	8.2		50.6	9.5			50.0			47.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.1	0.3		19.6	0.2			0.2			0.9	
Delay (s)	50.2	8.5		70.2	9.7			50.2			48.7	
Level of Service	D	A		E	A			D			D	
Approach Delay (s)		9.7			10.7			50.2			48.7	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	105.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
16: Keawe St & Ala Moana Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			✥			✥	
Traffic Volume (vph)	35	2250	36	17	1716	9	79	10	58	10	2	65
Future Volume (vph)	35	2250	36	17	1716	9	79	10	58	10	2	65
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.95			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1770	5062		1770	5081			1717			1594	
Flt Permitted	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (perm)	1770	5062		1770	5081			1717			1594	
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)	36	2344	38	18	1788	9	82	10	60	10	2	68
RTOR Reduction (vph)	0	1	0	0	0	0	0	16	0	0	64	0
Lane Group Flow (vph)	36	2381	0	18	1797	0	0	136	0	0	16	0
Confl. Peds. (#/hr)			36			4						10
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases												
Actuated Green, G (s)	4.4	79.6		2.7	77.9			15.1			7.4	
Effective Green, g (s)	4.4	79.6		2.7	77.9			15.1			7.4	
Actuated g/C Ratio	0.04	0.64		0.02	0.62			0.12			0.06	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	62	3228		38	3171			207			94	
v/s Ratio Prot	c0.02	c0.47		0.01	0.35			c0.08			c0.01	
v/s Ratio Perm												
v/c Ratio	0.58	0.74		0.47	0.57			0.66			0.17	
Uniform Delay, d1	59.3	15.5		60.3	13.6			52.4			55.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	13.1	0.9		9.0	0.2			7.3			0.9	
Delay (s)	72.4	16.4		69.4	13.9			59.7			56.6	
Level of Service	E	B		E	B			E			E	
Approach Delay (s)		17.2			14.4			59.7			56.6	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	124.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX F

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

HCM Unsignalized Intersection Capacity Analysis
3: Ilalo St & Forrest Ave

7/8/2015

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	5	51	30	5	325	43
Future Volume (vph)	5	51	30	5	325	43
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	6	65	38	6	411	54

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	71	25	19	411	54
Volume Left (vph)	6	0	0	411	0
Volume Right (vph)	65	0	6	0	0
Hadj (s)	-0.50	0.03	-0.19	0.53	0.03
Departure Headway (s)	4.6	5.1	4.9	5.3	4.8
Degree Utilization, x	0.09	0.04	0.03	0.60	0.07
Capacity (veh/h)	710	679	708	675	742
Control Delay (s)	8.1	7.1	6.8	14.6	6.9
Approach Delay (s)	8.1	7.0		13.7	
Approach LOS	A	A		B	

Intersection Summary			
Delay	12.5		
Level of Service	B		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Ilalo St & Forrest Ave

7/8/2015

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	3	297	11	5	166	8
Future Volume (vph)	3	297	11	5	166	8
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	4	371	14	6	208	10

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	375	9	11	208	10
Volume Left (vph)	4	0	0	208	0
Volume Right (vph)	371	0	6	0	0
Hadj (s)	-0.56	0.03	-0.36	0.53	0.03
Departure Headway (s)	4.0	5.7	5.3	5.9	5.4
Degree Utilization, x	0.42	0.01	0.02	0.34	0.01
Capacity (veh/h)	854	585	625	579	630
Control Delay (s)	9.9	7.5	7.1	10.7	7.3
Approach Delay (s)	9.9	7.3		10.6	
Approach LOS	A	A		B	

Intersection Summary			
Delay	10.0		
Level of Service	B		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Cooke St & Ilalo St

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	49	12	23	140	24	1	16	8	25	21	93
Future Volume (vph)	27	49	12	23	140	24	1	16	8	25	21	93
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	32	58	14	27	165	28	1	19	9	29	25	109

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	104	220	29	54	109
Volume Left (vph)	32	27	1	29	0
Volume Right (vph)	14	28	9	0	109
Hadj (s)	0.01	-0.02	-0.15	0.30	-0.67
Departure Headway (s)	4.6	4.5	4.8	5.6	4.6
Degree Utilization, x	0.13	0.27	0.04	0.08	0.14
Capacity (veh/h)	739	767	684	604	729
Control Delay (s)	8.4	9.1	8.0	7.9	7.2
Approach Delay (s)	8.4	9.1	8.0	7.4	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	8.4		
Level of Service	A		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Cooke St & Ilalo St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			↰↑	↱
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	125	154	21	15	144	21	19	24	18	14	33	49
Future Volume (vph)	125	154	21	15	144	21	19	24	18	14	33	49
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	169	208	28	20	195	28	26	32	24	19	45	66

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	405	243	82	64	66
Volume Left (vph)	169	20	26	19	0
Volume Right (vph)	28	28	24	0	66
Hadj (s)	0.08	-0.02	-0.08	0.18	-0.67
Departure Headway (s)	4.9	5.1	5.8	6.5	5.6
Degree Utilization, x	0.56	0.34	0.13	0.11	0.10
Capacity (veh/h)	702	673	535	501	571
Control Delay (s)	13.9	10.7	9.7	9.1	8.0
Approach Delay (s)	13.9	10.7	9.7	8.6	
Approach LOS	B	B	A	A	

Intersection Summary			
Delay	11.8		
Level of Service	B		
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
8: Forrest Ave/South St & Ala Moana Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑↱			↑↑↑↱		↰	↑↱			↰↑	↱
Traffic Volume (vph)	217	2242	358	0	1824	45	49	28	1	7	38	32
Future Volume (vph)	217	2242	358	0	1824	45	49	28	1	7	38	32
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	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	0.89
Flpb, ped/bikes	1.00	1.00			1.00		0.91	1.00			1.00	1.00
Frt	1.00	0.98			1.00		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1770	4958			5065		1602	1853			1849	1407
Flt Permitted	0.95	1.00			1.00		0.73	1.00			0.95	1.00
Satd. Flow (perm)	1770	4958			5065		1226	1853			1767	1407
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	224	2311	369	0	1880	46	51	29	1	7	39	33
RTOR Reduction (vph)	0	8	0	0	1	0	0	1	0	0	0	0
Lane Group Flow (vph)	224	2672	0	0	1925	0	51	29	0	0	46	33
Confl. Peds. (#/hr)			11			3	53					53
Turn Type	Prot	NA			NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	20.5	95.9			70.4		8.7	8.7			8.7	8.7
Effective Green, g (s)	20.5	95.9			70.4		8.7	8.7			8.7	8.7
Actuated g/C Ratio	0.18	0.84			0.61		0.08	0.08			0.08	0.08
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	316	4148			3111		93	140			134	106
v/s Ratio Prot	0.13	c0.54			0.38			0.02				
v/s Ratio Perm							c0.04				0.03	0.02
v/c Ratio	0.71	0.64			0.62		0.55	0.21			0.34	0.31
Uniform Delay, d1	44.2	3.3			13.7		51.1	49.7			50.2	50.1
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	7.1	0.3			0.4		6.5	0.7			1.5	1.7
Delay (s)	51.3	3.7			14.1		57.5	50.5			51.8	51.8
Level of Service	D	A			B		E	D			D	D
Approach Delay (s)		7.3			14.1			54.9			51.8	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Forrest Ave/South St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱			↑↑↱		↰	↱			↰	↱
Traffic Volume (vph)	163	2368	165	0	1901	34	197	95	6	13	10	140
Future Volume (vph)	163	2368	165	0	1901	34	197	95	6	13	10	140
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	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.99			1.00		1.00	1.00			1.00	0.89
Flpb, ped/bikes	1.00	1.00			1.00		0.90	1.00			1.00	1.00
Frt	1.00	0.99			1.00		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	5010			5068		1594	1846			1812	1406
Flt Permitted	0.95	1.00			1.00		0.74	1.00			0.86	1.00
Satd. Flow (perm)	1770	5010			5068		1246	1846			1604	1406
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	166	2416	168	0	1940	35	201	97	6	13	10	143
RTOR Reduction (vph)	0	4	0	0	1	0	0	2	0	0	0	0
Lane Group Flow (vph)	166	2580	0	0	1974	0	201	101	0	0	23	143
Confl. Peds. (#/hr)			32			12	48					48
Turn Type	Prot	NA			NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	17.1	91.1			69.0		26.7	26.7			26.7	26.7
Effective Green, g (s)	17.1	91.1			69.0		26.7	26.7			26.7	26.7
Actuated g/C Ratio	0.13	0.71			0.54		0.21	0.21			0.21	0.21
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	236	3571			2736		260	385			335	293
v/s Ratio Prot	0.09	c0.51			0.39			0.05				
v/s Ratio Perm							c0.16				0.01	0.10
v/c Ratio	0.70	0.72			0.72		0.77	0.26			0.07	0.49
Uniform Delay, d1	52.9	10.9			22.2		47.7	42.3			40.6	44.5
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	9.1	0.7			1.0		13.3	0.4			0.1	1.3
Delay (s)	62.1	11.6			23.1		61.0	42.7			40.7	45.8
Level of Service	E	B			C		E	D			D	D
Approach Delay (s)		14.7			23.1			54.8			45.1	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	127.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: Cooke St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰	↱		↰	↱
Traffic Volume (vph)	106	1947	35	63	1896	18	25	17	15	21	36	62
Future Volume (vph)	106	1947	35	63	1896	18	25	17	15	21	36	62
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1770	5069		1770	5076			1794	1542		1820	1542
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.86	1.00
Satd. Flow (perm)	1770	5069		1770	5076			1449	1542		1596	1542
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	107	1967	35	64	1915	18	25	17	15	21	36	63
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	14	0	0	58
Lane Group Flow (vph)	107	2001	0	64	1932	0	0	42	1	0	57	5
Confl. Peds. (#/hr)			16			10	9		9	9		9
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	12.1	67.0		7.8	62.7			7.7	7.7		7.7	7.7
Effective Green, g (s)	12.1	67.0		7.8	62.7			7.7	7.7		7.7	7.7
Actuated g/C Ratio	0.12	0.69		0.08	0.64			0.08	0.08		0.08	0.08
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	219	3483		141	3264			114	121		126	121
v/s Ratio Prot	c0.06	c0.39		0.04	0.38							
v/s Ratio Perm								0.03	0.00		c0.04	0.00
v/c Ratio	0.49	0.57		0.45	0.59			0.37	0.01		0.45	0.04
Uniform Delay, d1	39.8	7.9		42.8	10.0			42.6	41.4		42.9	41.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.7	0.2		2.3	0.3			2.0	0.0		2.6	0.1
Delay (s)	41.5	8.1		45.1	10.3			44.6	41.4		45.5	41.6
Level of Service	D	A		D	B			D	D		D	D
Approach Delay (s)		9.8			11.4			43.8			43.4	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	97.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: Cooke St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	2399	32	26	1619	47	43	57	91	40	44	97
Future Volume (vph)	54	2399	32	26	1619	47	43	57	91	40	44	97
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.98	1.00
Satd. Flow (prot)	1770	5071		1770	5051			1798	1542		1809	1507
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.70	1.00
Satd. Flow (perm)	1770	5071		1770	5051			1439	1542		1299	1507
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)	56	2499	33	27	1686	49	45	59	95	42	46	101
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	79	0	0	89
Lane Group Flow (vph)	56	2531	0	27	1733	0	0	104	16	0	88	12
Confl. Peds. (#/hr)			26			21	18		7	7		18
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	7.6	90.1		4.1	86.6			14.2	14.2		14.2	14.2
Effective Green, g (s)	7.6	90.1		4.1	86.6			14.2	14.2		14.2	14.2
Actuated g/C Ratio	0.06	0.73		0.03	0.70			0.12	0.12		0.12	0.12
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	109	3702		58	3544			165	177		149	173
v/s Ratio Prot	c0.03	c0.50		0.02	0.34							
v/s Ratio Perm								c0.07	0.01		0.07	0.01
v/c Ratio	0.51	0.68		0.47	0.49			0.63	0.09		0.59	0.07
Uniform Delay, d1	56.1	9.0		58.6	8.4			52.1	48.8		51.8	48.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.0	0.5		5.8	0.1			7.6	0.2		6.1	0.2
Delay (s)	60.2	9.5		64.4	8.5			59.7	49.1		58.0	48.9
Level of Service	E	A		E	A			E	D		E	D
Approach Delay (s)		10.6			9.3			54.6			53.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	123.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
12: Ilalo St & Coral St

7/8/2015

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	66	166	68	22	82
Future Volume (Veh/h)	26	66	166	68	22	82
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	30	77	193	79	26	95
Pedestrians		13	9		7	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		1	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	279				386	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	279				386	252
tC, single (s)	4.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				*2.5	*2.3
p0 queue free %	98				97	92
cM capacity (veh/h)	1275				885	1155

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	107	272	121
Volume Left	30	0	26
Volume Right	0	79	95
cSH	1275	1700	1084
Volume to Capacity	0.02	0.16	0.11
Queue Length 95th (ft)	2	0	9
Control Delay (s)	2.4	0.0	8.7
Lane LOS	A		A
Approach Delay (s)	2.4	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
12: Ilalo St & Coral St

7/8/2015

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	103	253	174	38	47	41
Future Volume (Veh/h)	103	253	174	38	47	41
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	134	329	226	49	61	53
Pedestrians		18	15		11	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		2	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	286				874	280
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	286				874	280
tC, single (s)	4.1				*5.4	*5.2
tC, 2 stage (s)						
tF (s)	2.2				*2.5	*2.3
p0 queue free %	89				86	95
cM capacity (veh/h)	1263				452	1110

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	463	275	114
Volume Left	134	0	61
Volume Right	0	49	53
cSH	1263	1700	624
Volume to Capacity	0.11	0.16	0.18
Queue Length 95th (ft)	9	0	17
Control Delay (s)	3.1	0.0	12.1
Lane LOS	A		B
Approach Delay (s)	3.1	0.0	12.1
Approach LOS			B

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Signalized Intersection Capacity Analysis
13: Coral St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	2066	83	72	1863	48	11	9	16	18	40	13
Future Volume (vph)	39	2066	83	72	1863	48	11	9	16	18	40	13
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		1.00	0.90
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.95	1.00		0.99	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1770	5035		1770	5058			1730	1525		1820	1425
Flt Permitted	0.95	1.00		0.95	1.00			0.80	1.00		0.89	1.00
Satd. Flow (perm)	1770	5035		1770	5058			1417	1525		1642	1425
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	39	2087	84	73	1882	48	11	9	16	18	40	13
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	15	0	0	12
Lane Group Flow (vph)	39	2169	0	73	1928	0	0	20	1	0	58	1
Confl. Peds. (#/hr)			30			15	50		14	14		50
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	4.8	77.1		8.3	80.6			7.7	7.7		7.7	7.7
Effective Green, g (s)	4.8	77.1		8.3	80.6			7.7	7.7		7.7	7.7
Actuated g/C Ratio	0.04	0.71		0.08	0.75			0.07	0.07		0.07	0.07
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	78	3591		135	3771			100	108		116	101
v/s Ratio Prot	0.02	c0.43		c0.04	c0.38							
v/s Ratio Perm								0.01	0.00		c0.04	0.00
v/c Ratio	0.50	0.60		0.54	0.51			0.20	0.01		0.50	0.01
Uniform Delay, d1	50.5	7.8		48.1	5.7			47.3	46.7		48.3	46.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.0	0.3		4.4	0.1			1.0	0.0		3.4	0.0
Delay (s)	55.4	8.1		52.4	5.8			48.3	46.7		51.7	46.7
Level of Service	E	A		D	A			D	D		D	D
Approach Delay (s)		8.9			7.5			47.6			50.8	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	108.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: Coral St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (vph)	26	2357	38	28	1700	38	60	46	110	18	17	32
Future Volume (vph)	26	2357	38	28	1700	38	60	46	110	18	17	32
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			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.89
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.95	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5063		1770	5056			1713	1545		1807	1409
Flt Permitted	0.95	1.00		0.95	1.00			0.80	1.00		0.82	1.00
Satd. Flow (perm)	1770	5063		1770	5056			1416	1545		1526	1409
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)	27	2455	40	29	1771	40	62	48	115	19	18	33
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	76	0	0	29
Lane Group Flow (vph)	27	2494	0	29	1810	0	0	111	39	0	37	4
Confl. Peds. (#/hr)			31			26	48		6	6		48
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	4.1	90.6		4.1	90.6			15.7	15.7		15.7	15.7
Effective Green, g (s)	4.1	90.6		4.1	90.6			15.7	15.7		15.7	15.7
Actuated g/C Ratio	0.03	0.72		0.03	0.72			0.13	0.13		0.13	0.13
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	57	3657		57	3652			177	193		191	176
v/s Ratio Prot	0.02	c0.49		c0.02	0.36							
v/s Ratio Perm								c0.08	0.03		0.02	0.00
v/c Ratio	0.47	0.68		0.51	0.50			0.63	0.20		0.19	0.02
Uniform Delay, d1	59.6	9.5		59.7	7.5			52.1	49.2		49.2	48.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	6.1	0.5		7.0	0.1			6.8	0.5		0.5	0.1
Delay (s)	65.7	10.1		66.6	7.6			58.8	49.7		49.7	48.2
Level of Service	E	B		E	A			E	D		D	D
Approach Delay (s)		10.6			8.6			54.2			49.0	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	125.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
15: Keawe St & Ilalo St

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰↑↱			↰↑↱			↰↑↱	
Traffic Volume (veh/h)	9	65	6	41	191	15	6	17	11	16	16	49
Future Volume (Veh/h)	9	65	6	41	191	15	6	17	11	16	16	49
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	10	73	7	46	215	17	7	19	12	18	18	55
Pedestrians		9			9			59			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			1			6			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	242			139			544	490	144	452	484	242
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	242			139			544	490	144	452	484	242
tC, single (s)	4.1			4.1			*6.1	*5.5	*5.2	*6.1	*5.5	*5.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			*2.5	*3.0	*2.3	*2.5	*3.0	*2.3
p0 queue free %	99			97			99	97	99	97	97	95
cM capacity (veh/h)	1312			1363			552	620	1244	682	624	1169

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	90	278	38	91
Volume Left	10	46	7	18
Volume Right	7	17	12	55
cSH	1312	1363	718	889
Volume to Capacity	0.01	0.03	0.05	0.10
Queue Length 95th (ft)	1	3	4	9
Control Delay (s)	0.9	1.5	10.3	9.5
Lane LOS	A	A	B	A
Approach Delay (s)	0.9	1.5	10.3	9.5
Approach LOS			B	A

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
15: Keawe St & Ilalo St

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	68	238	14	25	173	17	6	102	79	39	12	21
Future Volume (Veh/h)	68	238	14	25	173	17	6	102	79	39	12	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	88	309	18	32	225	22	8	132	103	51	16	27
Pedestrians		3			4			33			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			3			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	249			360			865	840	355	969	838	241
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	249			360			865	840	355	969	838	241
tC, single (s)	4.1			4.1			*5.1	*4.5	*4.2	*5.1	*4.5	*4.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			*2.5	*3.0	*2.3	*2.5	*3.0	*2.3
p0 queue free %	93			97			98	74	91	85	97	98
cM capacity (veh/h)	1314			1161			470	512	1116	330	513	1269

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	415	279	243	94
Volume Left	88	32	8	51
Volume Right	18	22	103	27
cSH	1314	1161	662	454
Volume to Capacity	0.07	0.03	0.37	0.21
Queue Length 95th (ft)	5	2	42	19
Control Delay (s)	2.2	1.2	13.6	15.0
Lane LOS	A	A	B	B
Approach Delay (s)	2.2	1.2	13.6	15.0
Approach LOS			B	B

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Signalized Intersection Capacity Analysis
16: Keawe St & Ala Moana Blvd

7/8/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			✥			✥	
Traffic Volume (vph)	60	2157	33	60	1807	20	16	0	23	8	3	46
Future Volume (vph)	60	2157	33	60	1807	20	16	0	23	8	3	46
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.98			0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.92			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1770	5067		1770	5072			1641			1581	
Flt Permitted	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (perm)	1770	5067		1770	5072			1641			1581	
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)	62	2247	34	62	1882	21	17	0	24	8	3	48
RTOR Reduction (vph)	0	1	0	0	1	0	0	40	0	0	46	0
Lane Group Flow (vph)	63	2280	0	63	1902	0	0	1	0	0	13	0
Confl. Peds. (#/hr)			21			21			15	15		20
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		3	3	
Permitted Phases												
Actuated Green, G (s)	7.2	77.5		7.2	77.5			3.9			5.4	
Effective Green, g (s)	7.2	77.5		7.2	77.5			3.9			5.4	
Actuated g/C Ratio	0.06	0.68		0.06	0.68			0.03			0.05	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	111	3444		111	3448			56			74	
v/s Ratio Prot	c0.04	c0.45		0.04	0.38			c0.00			c0.01	
v/s Ratio Perm												
v/c Ratio	0.57	0.66		0.57	0.55			0.03			0.18	
Uniform Delay, d1	51.9	10.6		51.9	9.4			53.2			52.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	6.5	0.5		6.5	0.2			0.2			1.2	
Delay (s)	58.4	11.1		58.4	9.5			53.4			53.3	
Level of Service	E	B		E	A			D			D	
Approach Delay (s)		12.4			11.1			53.4			53.3	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			✥			✥	
Traffic Volume (vph)	35	2316	36	23	1760	9	110	10	95	10	2	65
Future Volume (vph)	35	2316	36	23	1760	9	110	10	95	10	2	65
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			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.92	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.94			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1770	5062		1770	5081			1708			1514	
Flt Permitted	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (perm)	1770	5062		1770	5081			1708			1514	
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)	36	2412	38	24	1833	9	115	10	99	10	2	68
RTOR Reduction (vph)	0	1	0	0	0	0	0	20	0	0	65	0
Lane Group Flow (vph)	36	2450	0	24	1842	0	0	204	0	0	15	0
Confl. Peds. (#/hr)			36			4						10
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases												
Actuated Green, G (s)	6.7	85.2		3.3	81.8			21.0			5.1	
Effective Green, g (s)	6.7	85.2		3.3	81.8			21.0			5.1	
Actuated g/C Ratio	0.05	0.63		0.02	0.61			0.16			0.04	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	88	3204		43	3087			266			57	
v/s Ratio Prot	c0.02	c0.48		0.01	0.36			c0.12			c0.01	
v/s Ratio Perm												
v/c Ratio	0.41	0.76		0.56	0.60			0.77			0.26	
Uniform Delay, d1	62.0	17.6		64.9	16.2			54.4			62.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.1	1.1		14.8	0.3			12.4			2.4	
Delay (s)	65.1	18.7		79.7	16.6			66.8			65.3	
Level of Service	E	B		E	B			E			E	
Approach Delay (s)		19.4			17.4			66.8			65.3	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	134.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX D:

Alternative Site Schemes

Ferraro Choi & Associates, June 2015.

Alternate Site Schemes Explored

In the course of developing the proposed Master Plan for the Kakaako Makai Innovation Block, the design team considered several different alternative strategies for organizing the site.

The initial Schemes A, B, and C explored different locations of and relationships between the five major buildings. With further feedback from HCDA and HTDC, the subsequent Schemes D, E, F, and G followed a common approach of locating the Entrepreneur's Sandbox, Innovation Hale, and Kewalo Incubation Center near Ilalo Street with the Learning Center sited toward the Makai end of the block. These site options also tested variations on the interrelationships between the Sandbox, Innovation Hale, and Incubation Center as well as the likely construction phasing.

Scheme H confirmed two key priorities for HCDA and HTDC:

- Phase 1 of construction should be composed of the Sandbox and Innovation Hale, and
- The two buildings should be positioned to avoid the utility easements bisecting the site and therefore minimize the required site utility costs for Phase 1.

Scheme H also verified that the Innovation Hale should have frontage along Ilalo Street and would function as an intermediate element between the Sandbox and Incubation Center facilities. Finally, the central location of the public plaza location in this scheme was seen as serving as the "front door" of the Innovation Block.

As part of the Master Plan development process, preliminary massing studies were performed to examine the visual impact of the building volumes on the site as well as the spatial quality of the outdoor gathering areas.

SCHEME A

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

FERRARO CHOI

SCHEME B

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

FERRARO CHOI

SCHEME C

KAKAAKO MAKAI INNOVATION BLOCK AT LOT “C” MASTER PLAN - 06.17.2015

FERRARO CHOI

COLLABORATION CENTER
2 STORY W/LOFT SPACES - 30' HT.
13,500 SF
12,050 SF FOOTPRINT

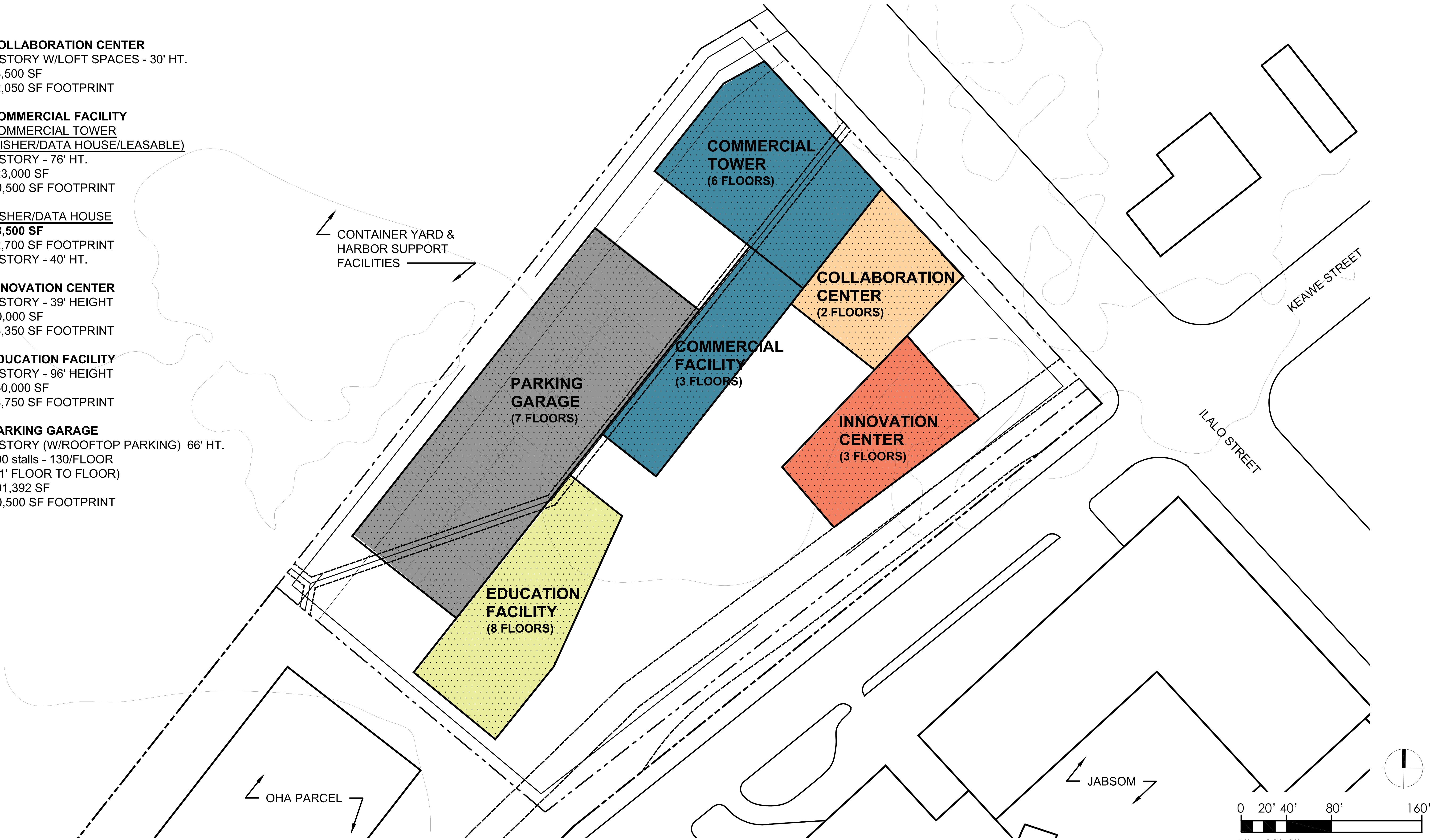
COMMERCIAL FACILITY
COMMERCIAL TOWER
(FISHER/DATA HOUSE/LEASABLE)
6 STORY - 76' HT.
123,000 SF
20,500 SF FOOTPRINT

FISHER/DATA HOUSE
33,500 SF
12,700 SF FOOTPRINT
3 STORY - 40' HT.

INNOVATION CENTER
3 STORY - 39' HEIGHT
40,000 SF
13,350 SF FOOTPRINT

EDUCATION FACILITY
8 STORY - 96' HEIGHT
150,000 SF
18,750 SF FOOTPRINT

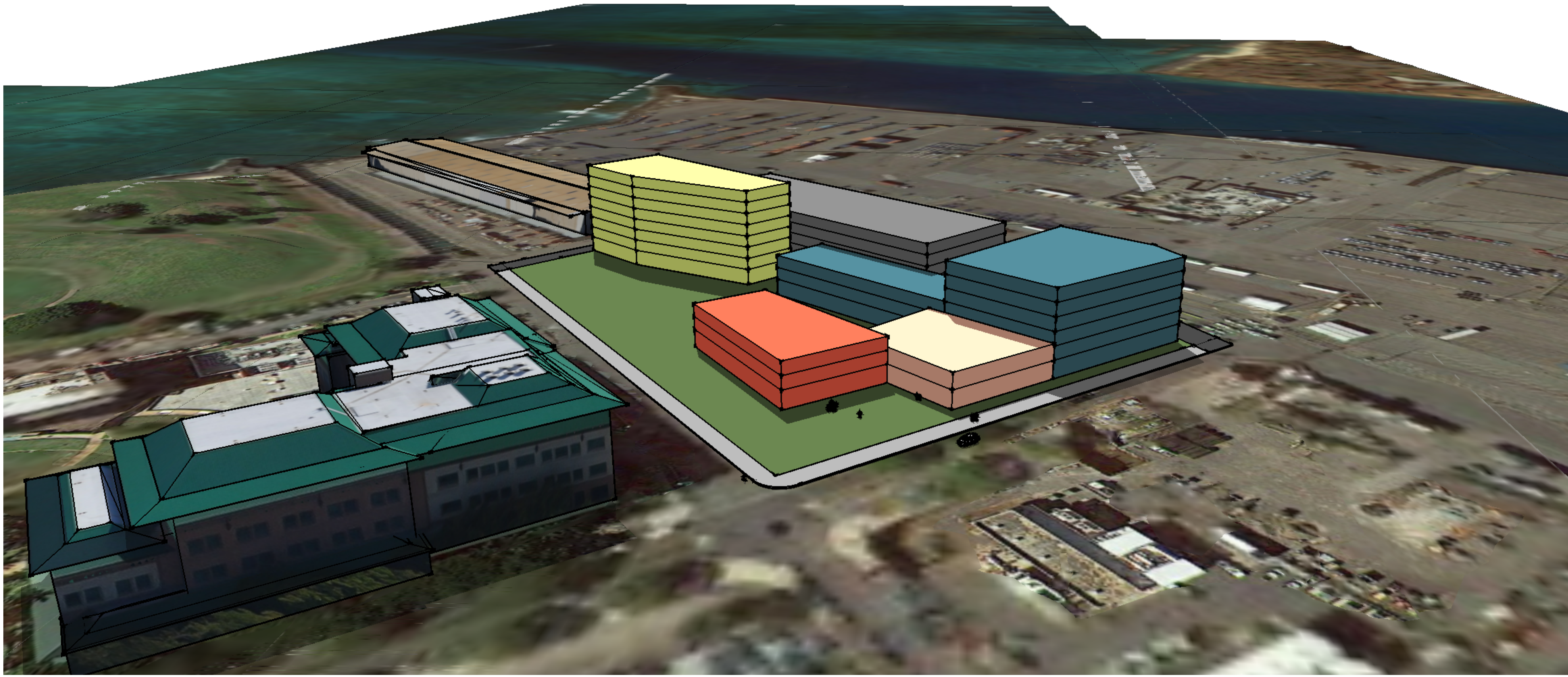
PARKING GARAGE
7 STORY (W/ROOFTOP PARKING) 66' HT.
900 stalls - 130/FLOOR
(11' FLOOR TO FLOOR)
301,392 SF
40,500 SF FOOTPRINT



SCHEME D

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

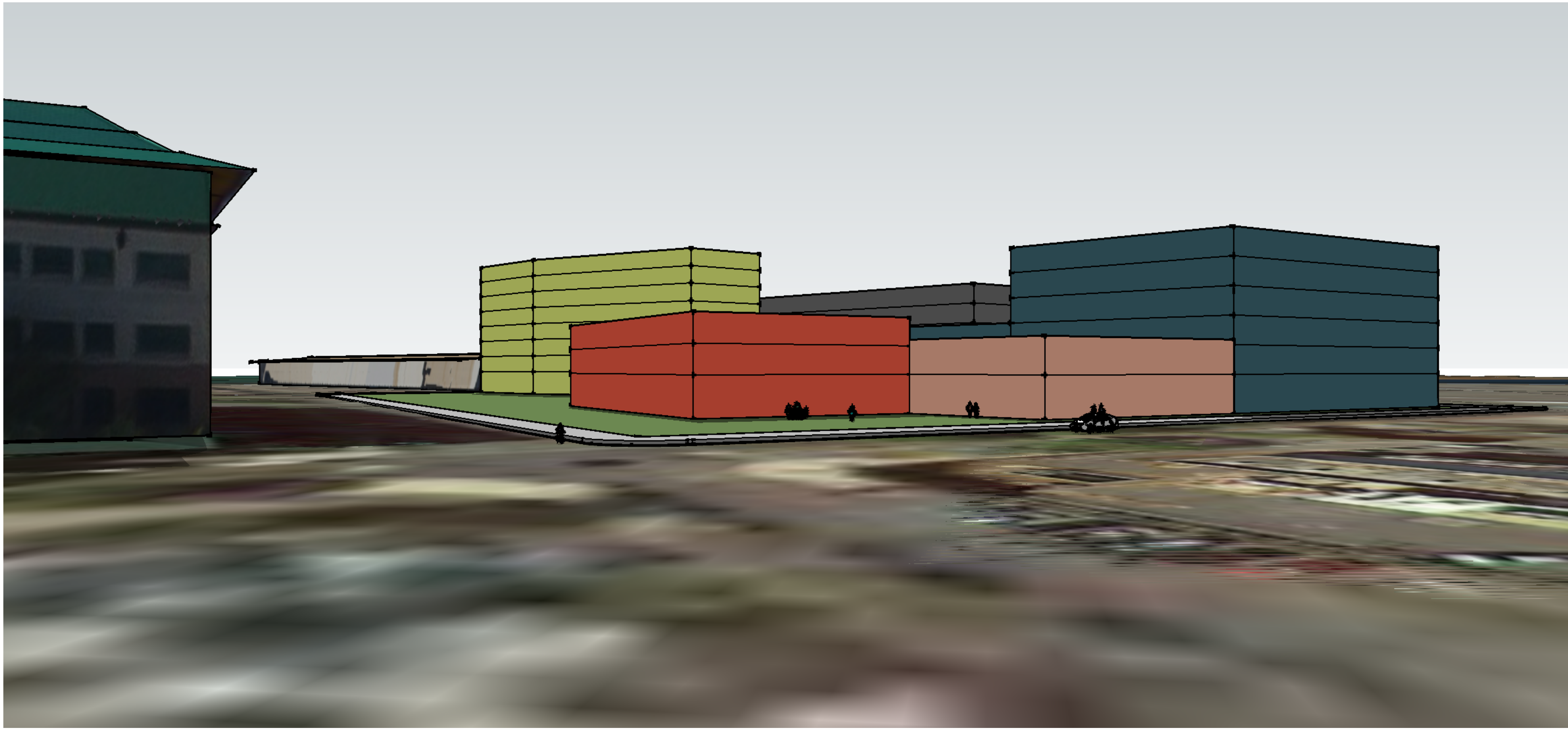
FERRARO CHOI



SCHEME D - 3D VIEW 1

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

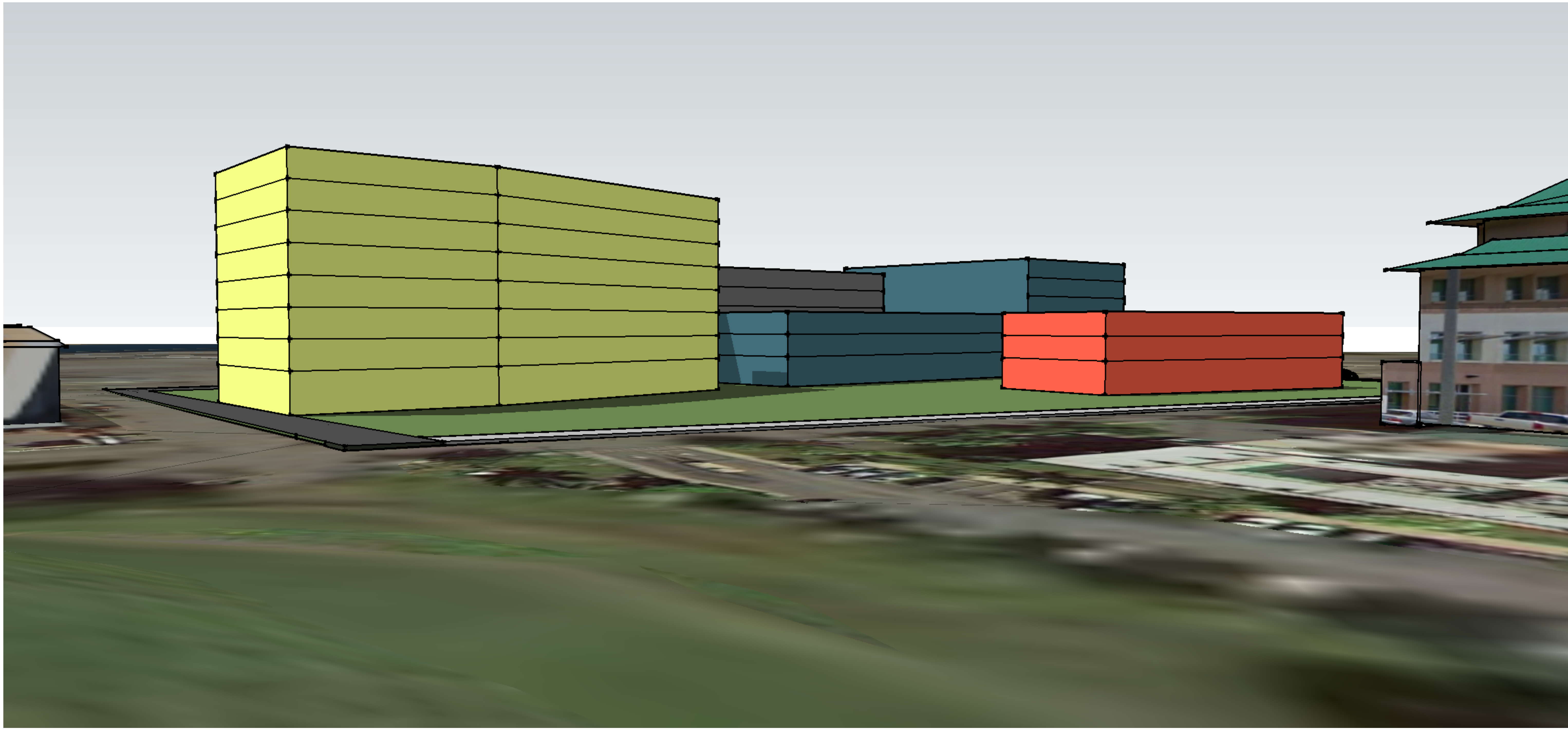
FERRARO CHOI



SCHEME D - 3D VIEW 2

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

FERRARO CHOI



SCHEME D - 3D VIEW 3

KAKAAKO MAKAI INNOVATION BLOCK AT LOT “C” MASTER PLAN - 06.17.2015

FERRARO CHOI

COLLABORATION CENTER
2 STORY W/LOFT SPACES - 30' HT.
13,500 SF
10,250 SF FOOTPRINT

COMMERCIAL FACILITY
FISHER/DATA HOUSE
3 STORY - 39' HT.
72,500 SF
24,167 SF FOOTPRINT

COMMERCIAL TOWER (LEASABLE)
8 STORY - 99' HT.
84,000 SF
10,500 SF FOOTPRINT

156,500 SF TOTAL

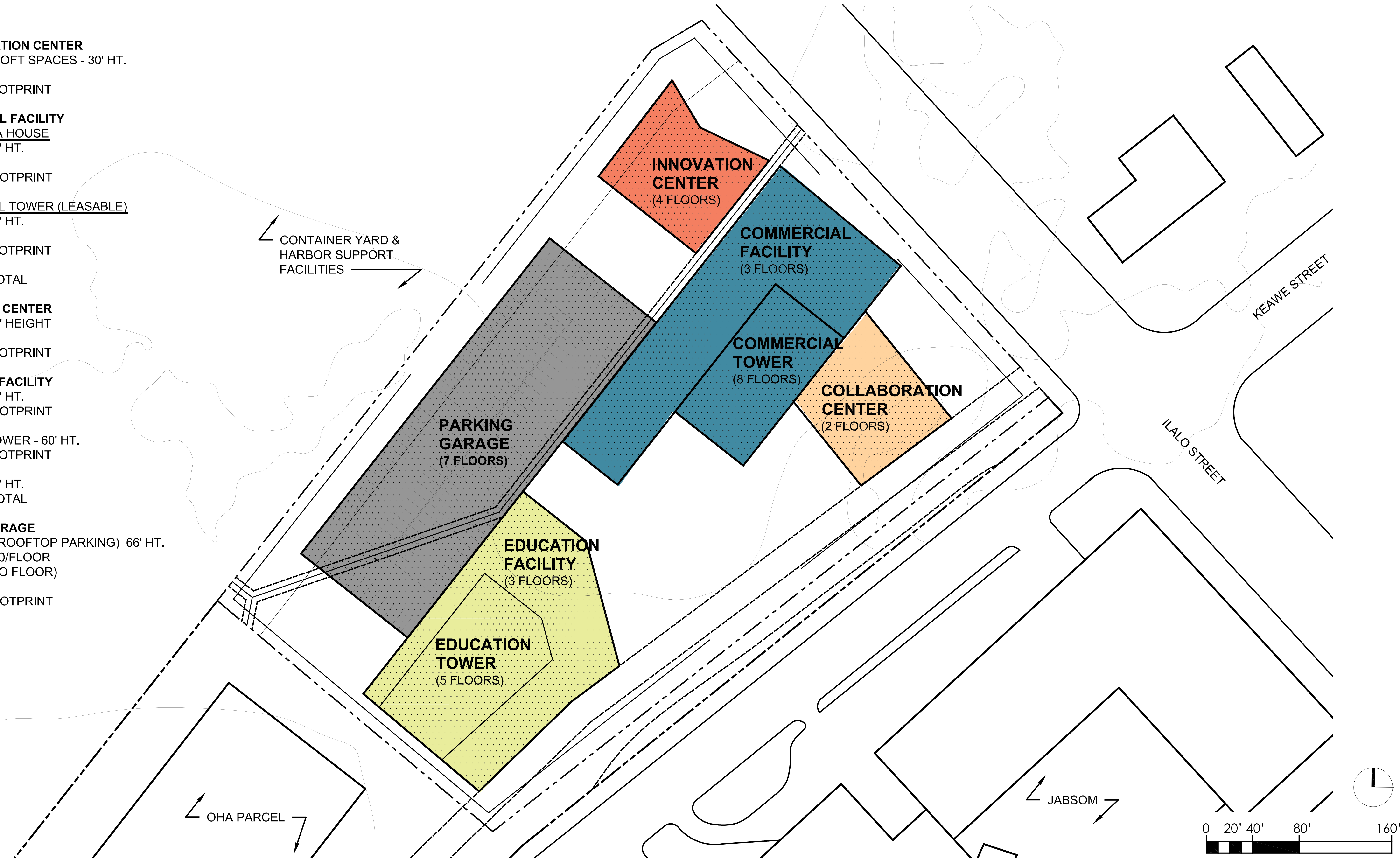
INNOVATION CENTER
4 STORY - 52' HEIGHT
40,000 SF
10,240 SF FOOTPRINT

EDUCATION FACILITY
3 STORY - 39' HT.
30,000 SF FOOTPRINT

+5 STORY TOWER - 60' HT.
12,000 SF FOOTPRINT

8 STORY - 99' HT.
150,000 SF TOTAL

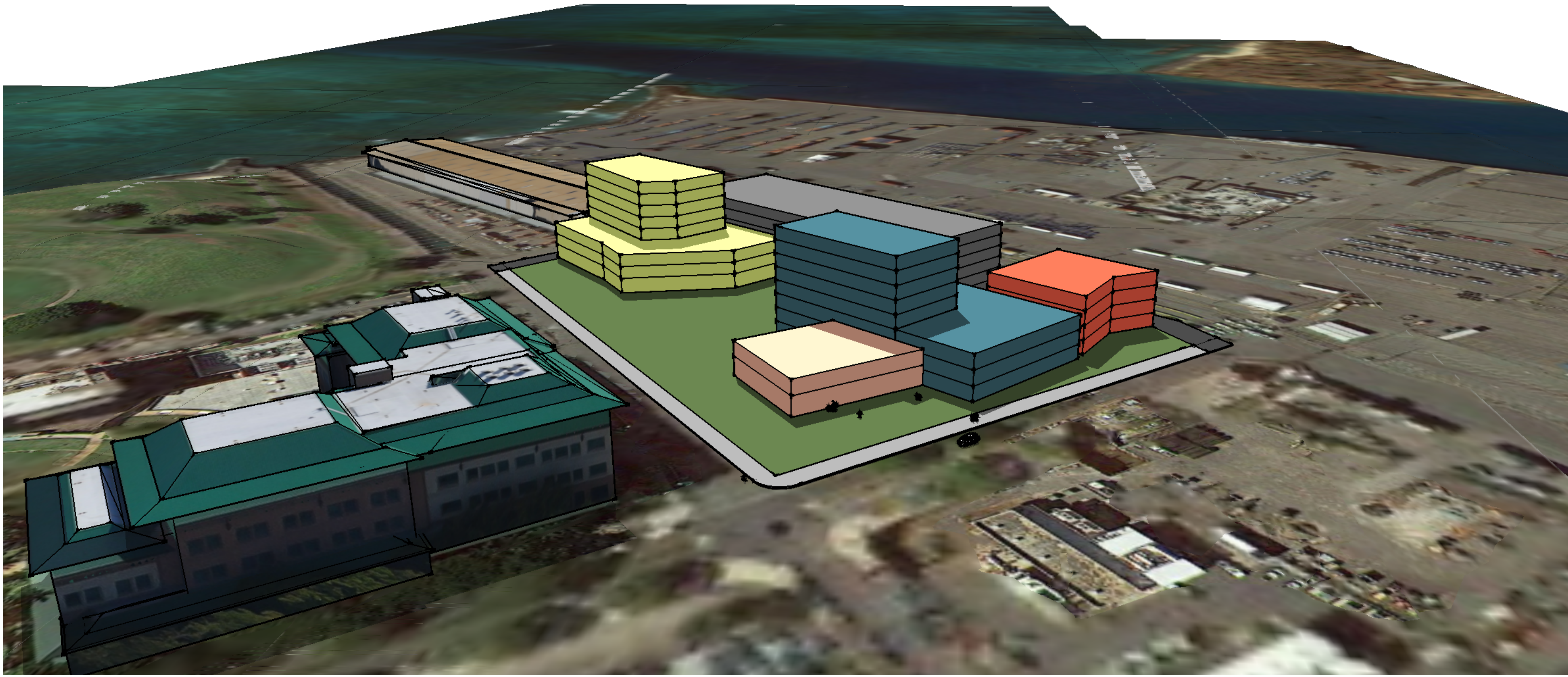
PARKING GARAGE
7 STORY (W/ROOFTOP PARKING) 66' HT.
900 stalls - 130/FLOOR
(11' FLOOR TO FLOOR)
301,392 SF
40,500 SF FOOTPRINT



SCHEME E

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

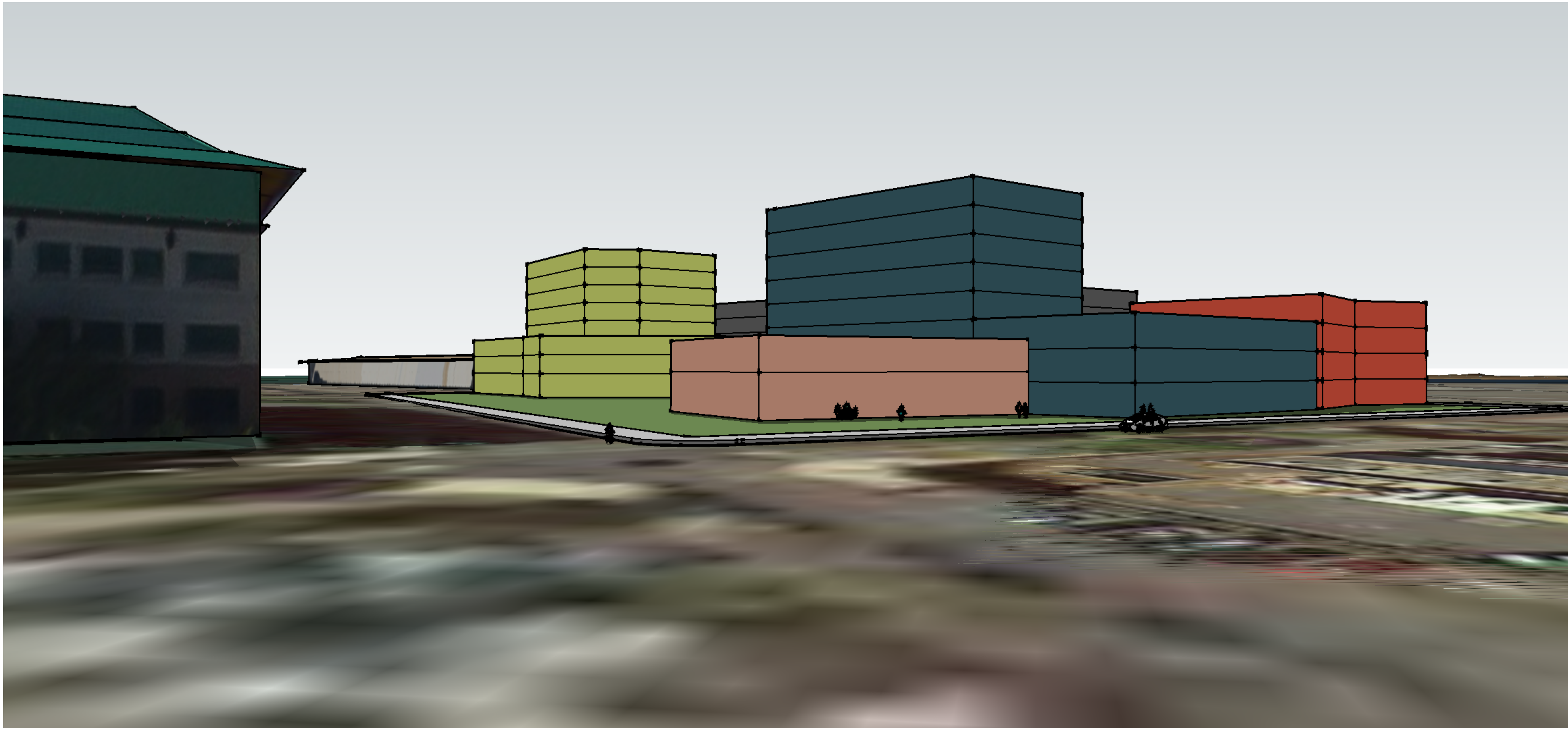
FERRARO CHOI



SCHEME E - 3D VIEW 1

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

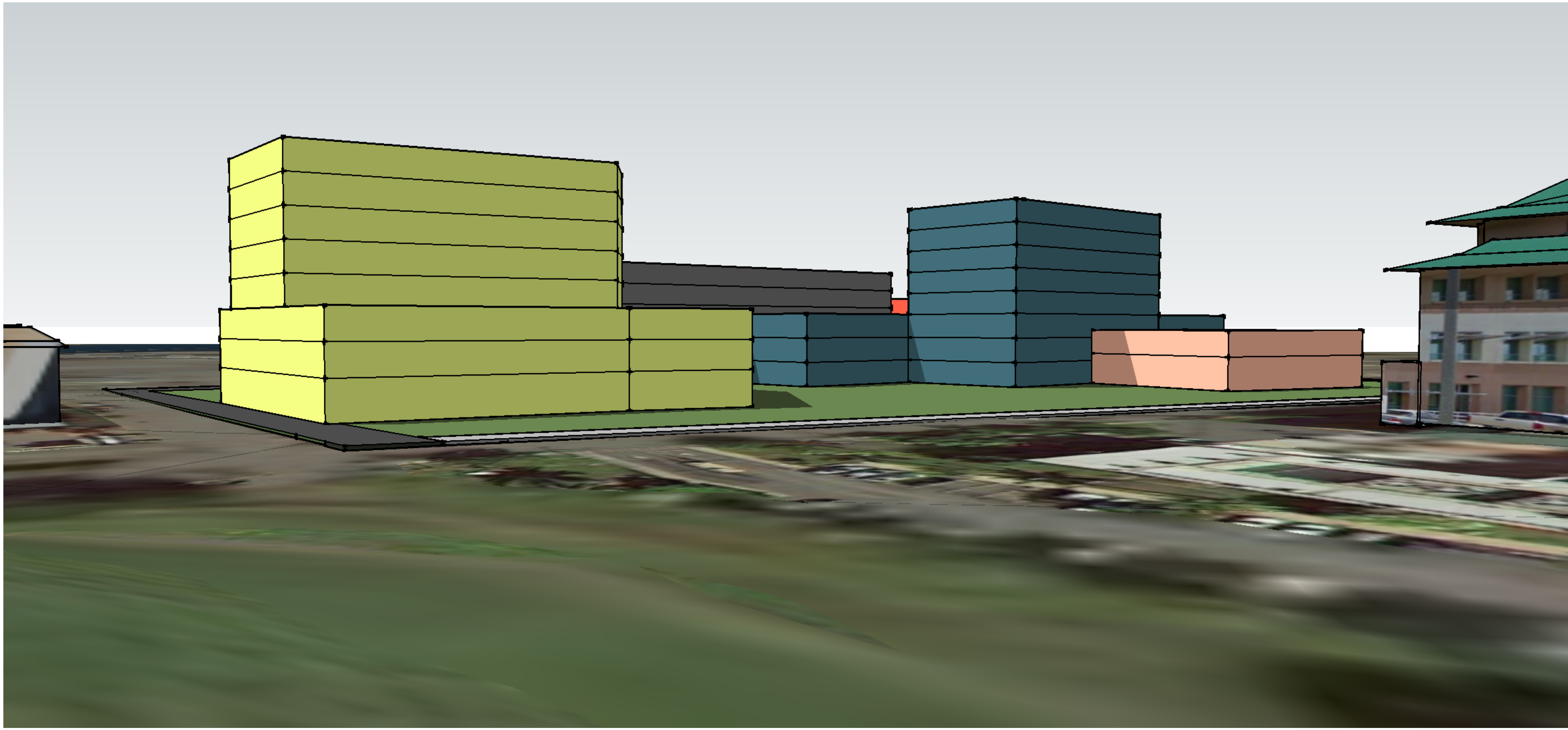
FERRARO CHOI



SCHEME E - 3D VIEW 2

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

FERRARO CHOI



SCHEME E - 3D VIEW 3

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

FERRARO CHOI

COLLABORATION CENTER
2 STORY W/LOFT SPACES - 30' HT.
13,500 SF
9,500 SF FOOTPRINT

COMMERCIAL FACILITY

FISHER/DATA HOUSE/LEASABLE
3 STORY - 39' HT.
106,500 SF
35,600 SF FOOTPRINT

COMMERCIAL TOWER (LEASABLE)
5 STORY (BUILT ATOP COMMERCIAL FACILITY)
50,000 SF
10,000 SF FOOTPRINT

8 STORY - 99' TOTAL HT.
156,500 SF TOTAL

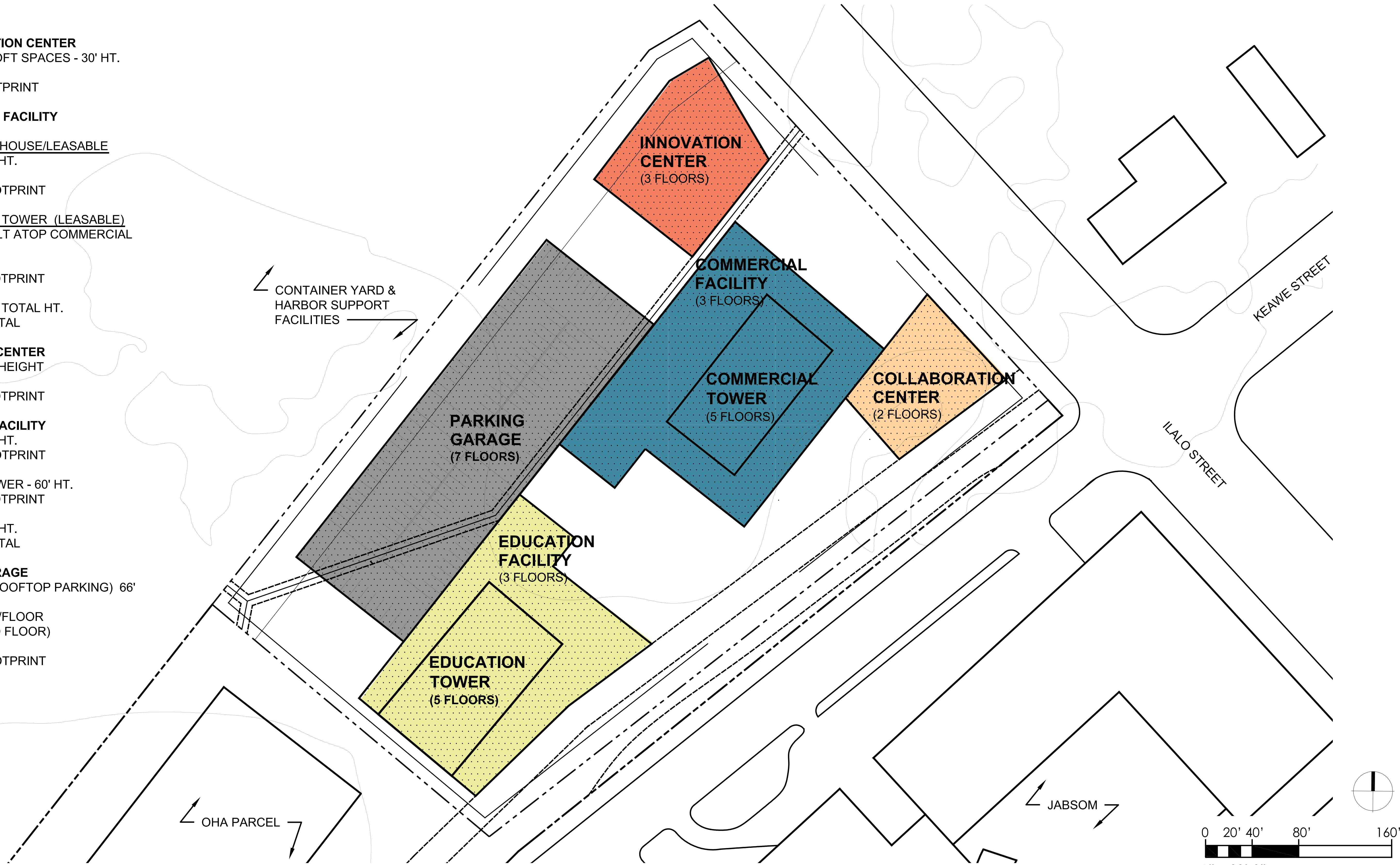
INNOVATION CENTER
3 STORY - 39' HEIGHT
40,000 SF
13,400 SF FOOTPRINT

EDUCATION FACILITY
3 STORY - 39' HT.
30,000 SF FOOTPRINT

+5 STORY TOWER - 60' HT.
12,000 SF FOOTPRINT

8 STORY - 99' HT.
150,000 SF TOTAL

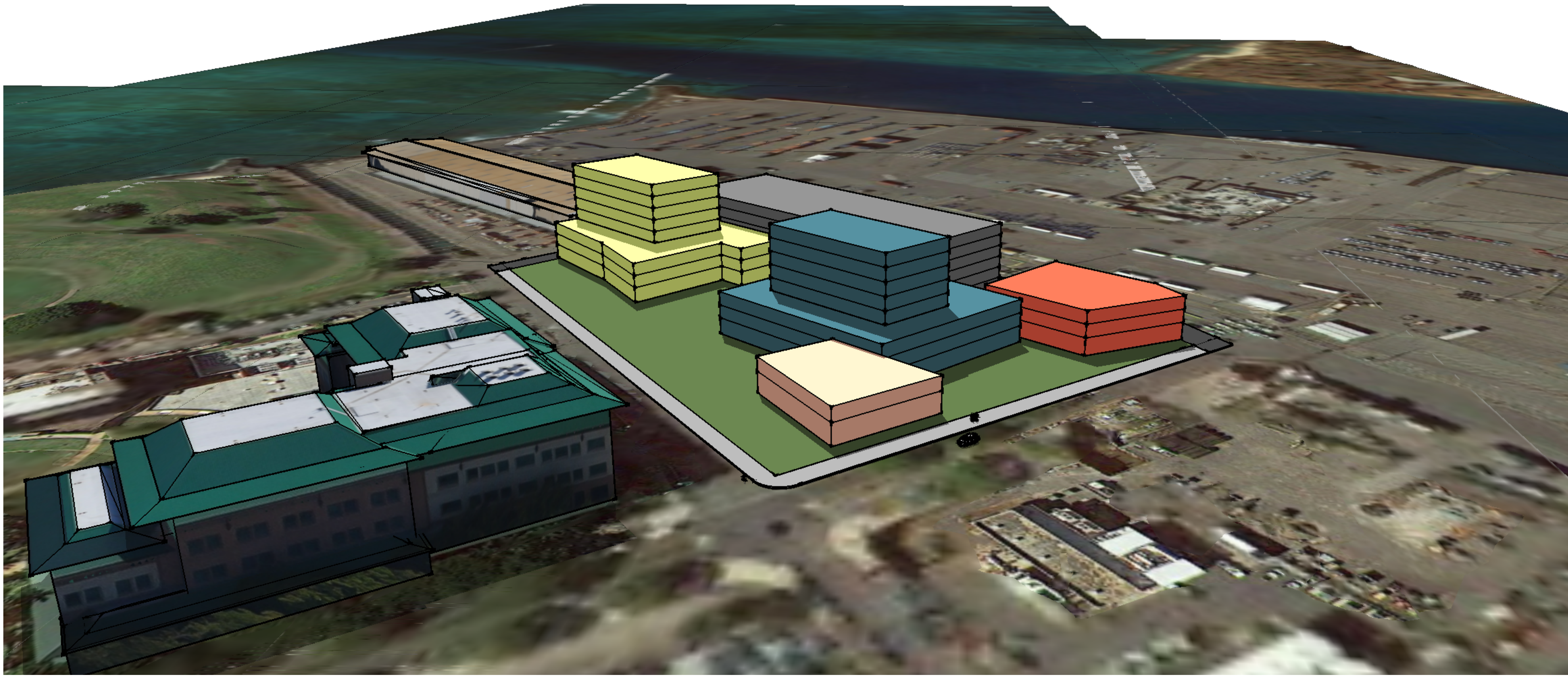
PARKING GARAGE
7 STORY (W/ROOFTOP PARKING) 66' HT.
900 stalls - 130/FLOOR
(11' FLOOR TO FLOOR)
301,392 SF
40,500 SF FOOTPRINT



SCHEME F

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

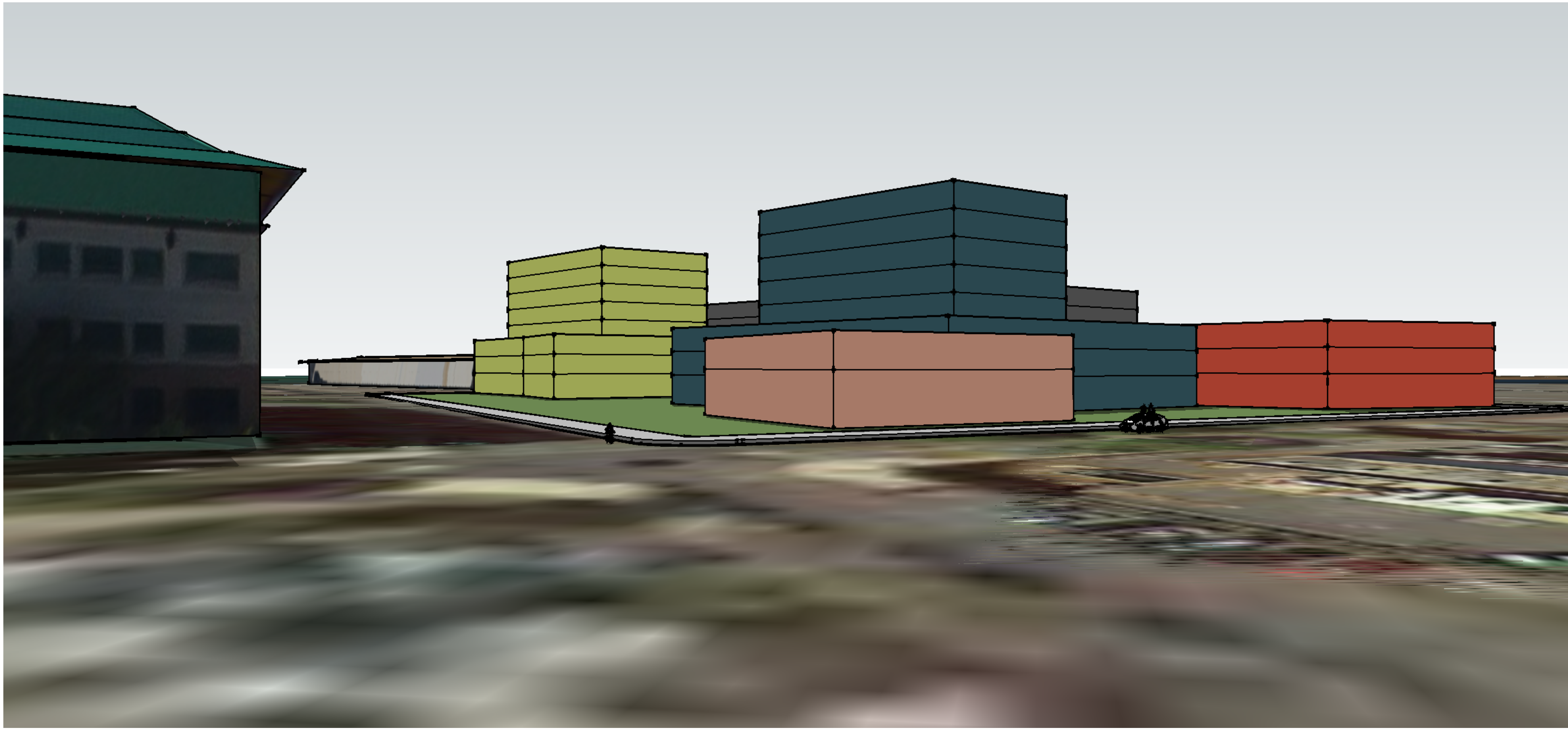
FERRARO CHOI



SCHEME F - 3D VIEW 1

KAKAAKO MAKAI INNOVATION BLOCK AT LOT “C” MASTER PLAN - 06.17.2015

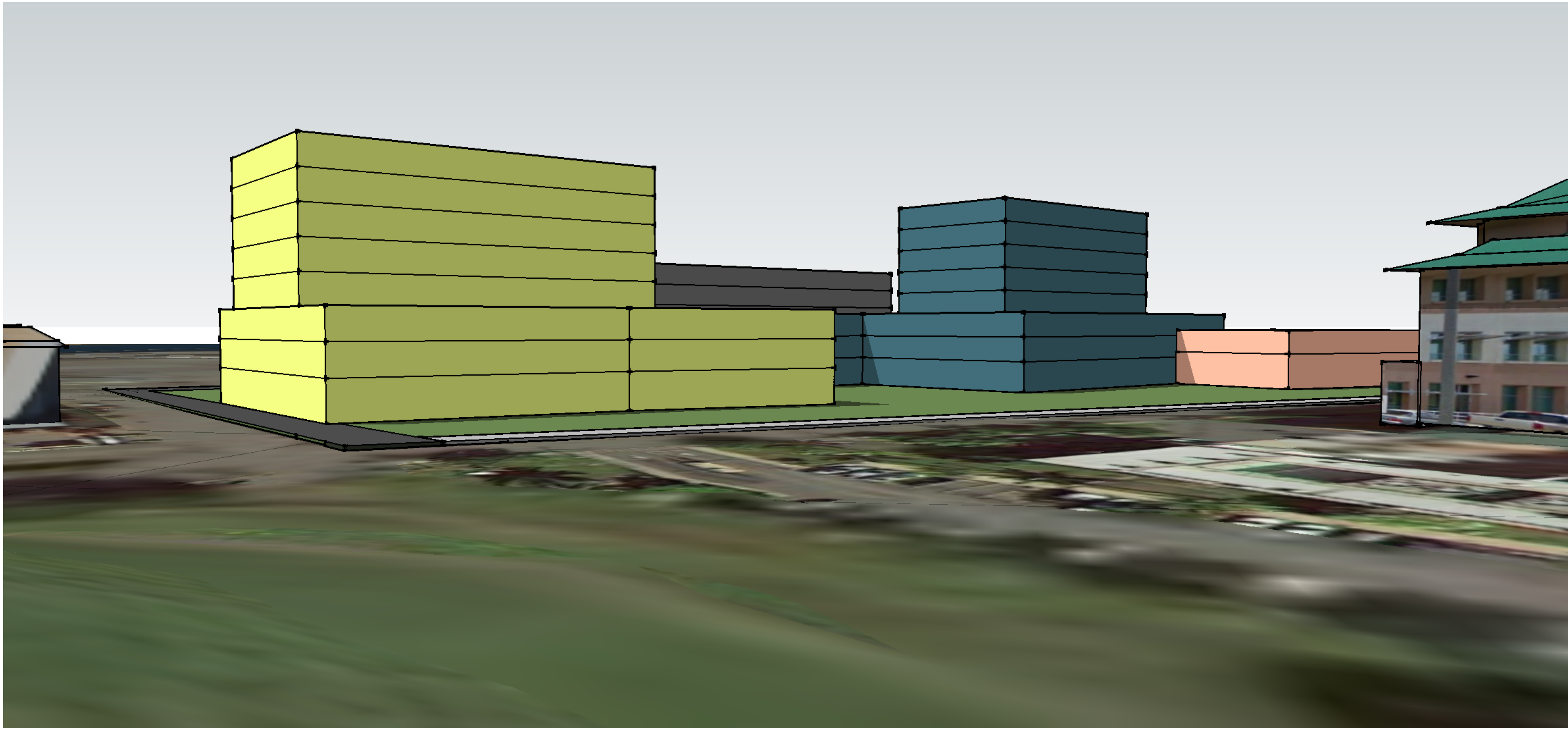
FERRARO CHOI



SCHEME F - 3D VIEW 2

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

FERRARO CHOI



SCHEME F - 3D VIEW 3

KAKAAKO MAKAI INNOVATION BLOCK AT LOT “C” MASTER PLAN - 06.17.2015

FERRARO CHOI

COLLABORATION CENTER
2 STORY W/LOFT SPACES - 30' HT.
10,670 SF FOOTPRINT
13,500 SF

COMMERCIAL FACILITY

FISHER/DATA HOUSE
3 STORY - 39' HT.
30,450 SF FOOTPRINT
100,350 SF

COMMERCIAL TOWER (LEASABLE)
5 STORY - 60' HT.
11,230 SF FOOTPRINT
56,150 SF

156,500 SF TOTAL - 96' HT.

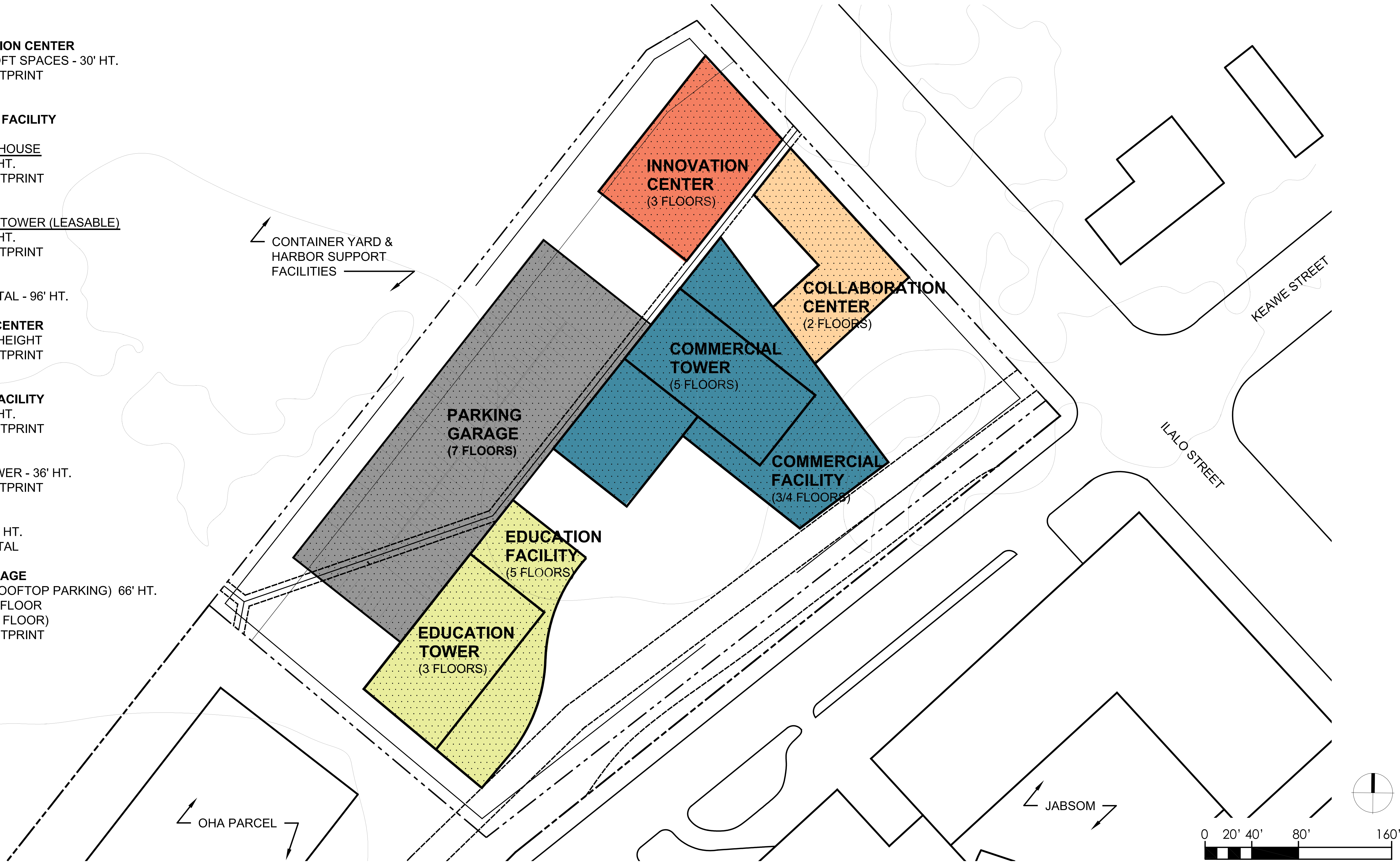
INNOVATION CENTER
3 STORY - 39' HEIGHT
13,333 SF FOOTPRINT
40,000 SF

EDUCATION FACILITY
5 STORY - 64' HT.
22,800 SF FOOTPRINT
114,000 SF

+3 STORY TOWER - 36' HT.
12,000 SF FOOTPRINT
36,000 SF

8 STORY - 100' HT.
150,000 SF TOTAL

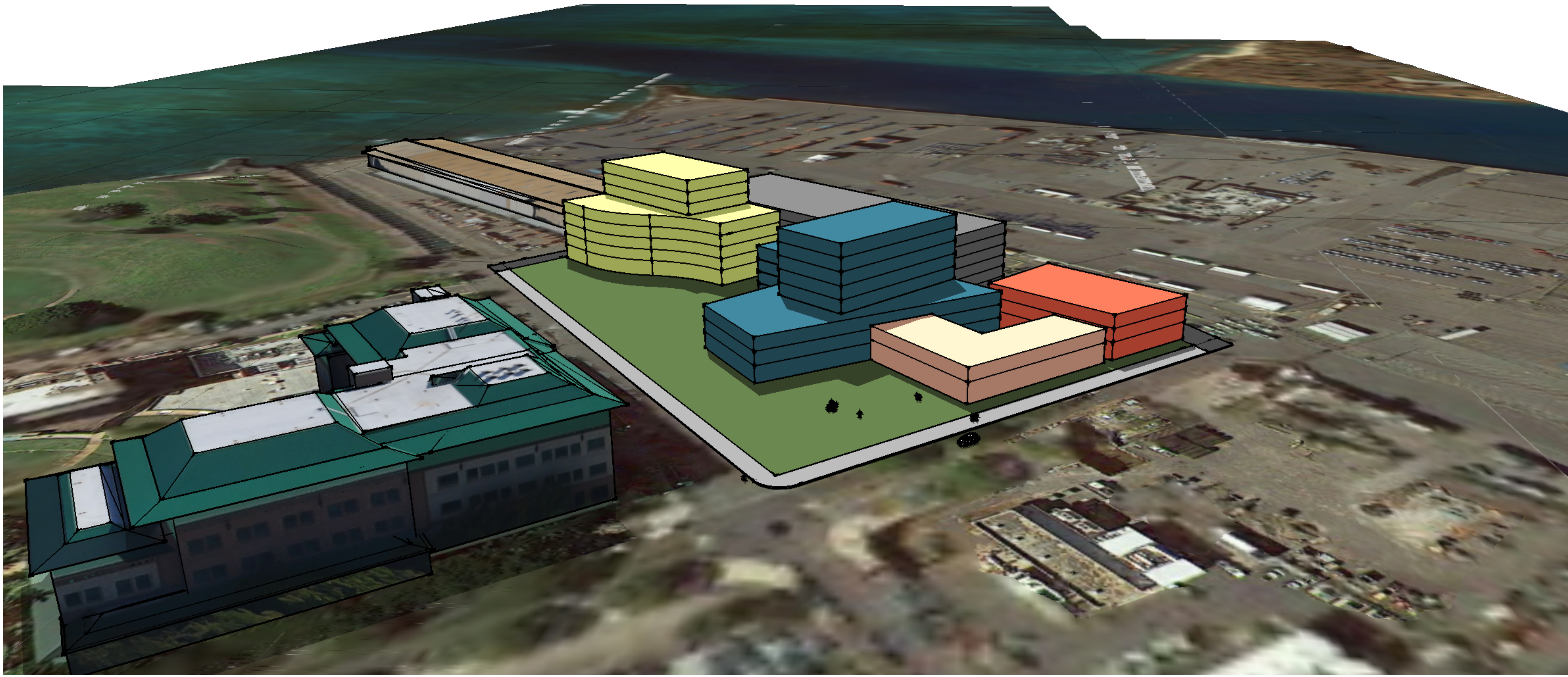
PARKING GARAGE
7 STORY (W/ROOFTOP PARKING) 66' HT.
900 stalls - 130/FLOOR
(11' FLOOR TO FLOOR)
40,500 SF FOOTPRINT
301,392 SF



SCHEME G

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

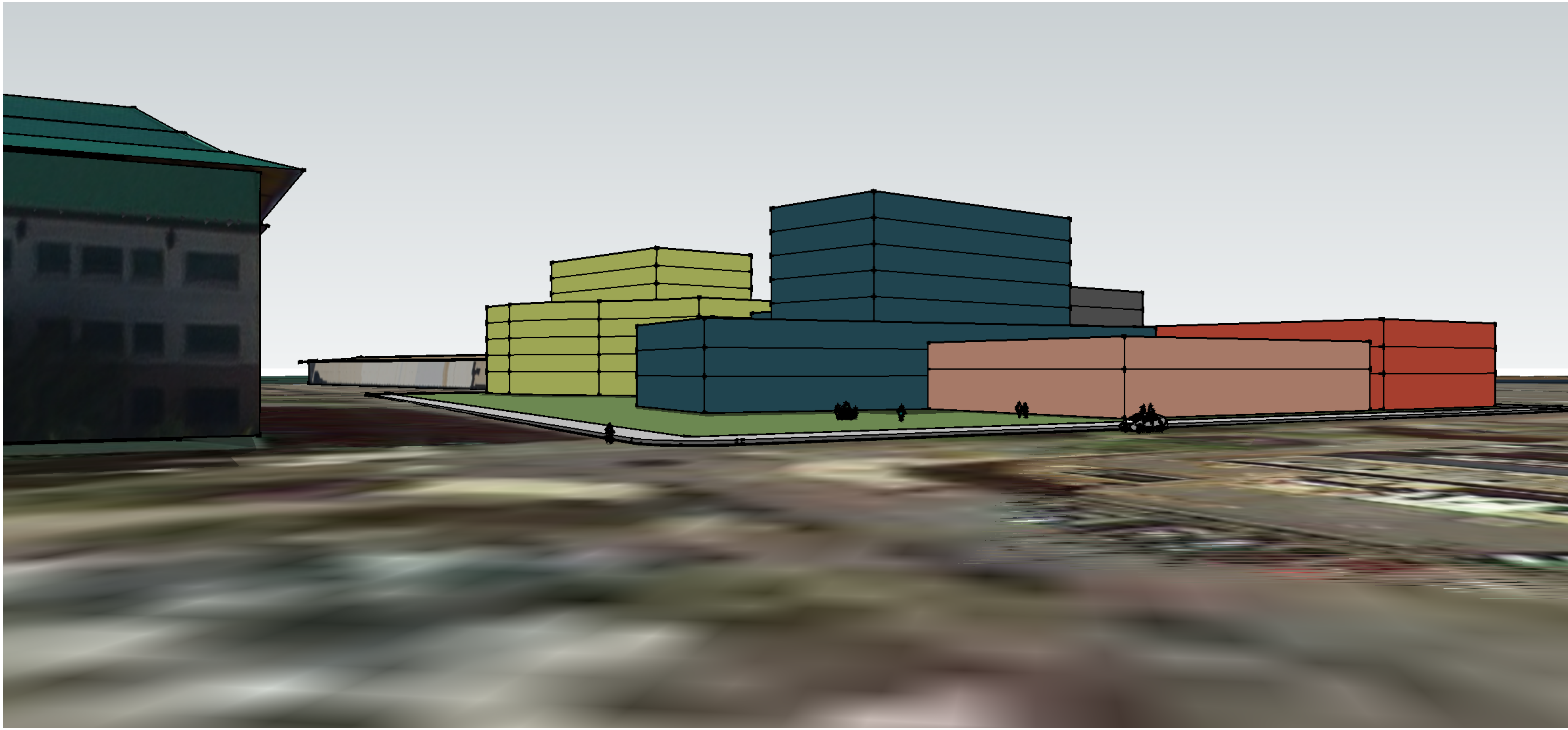
FERRARO CHOI



SCHEME G - 3D VIEW 1

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

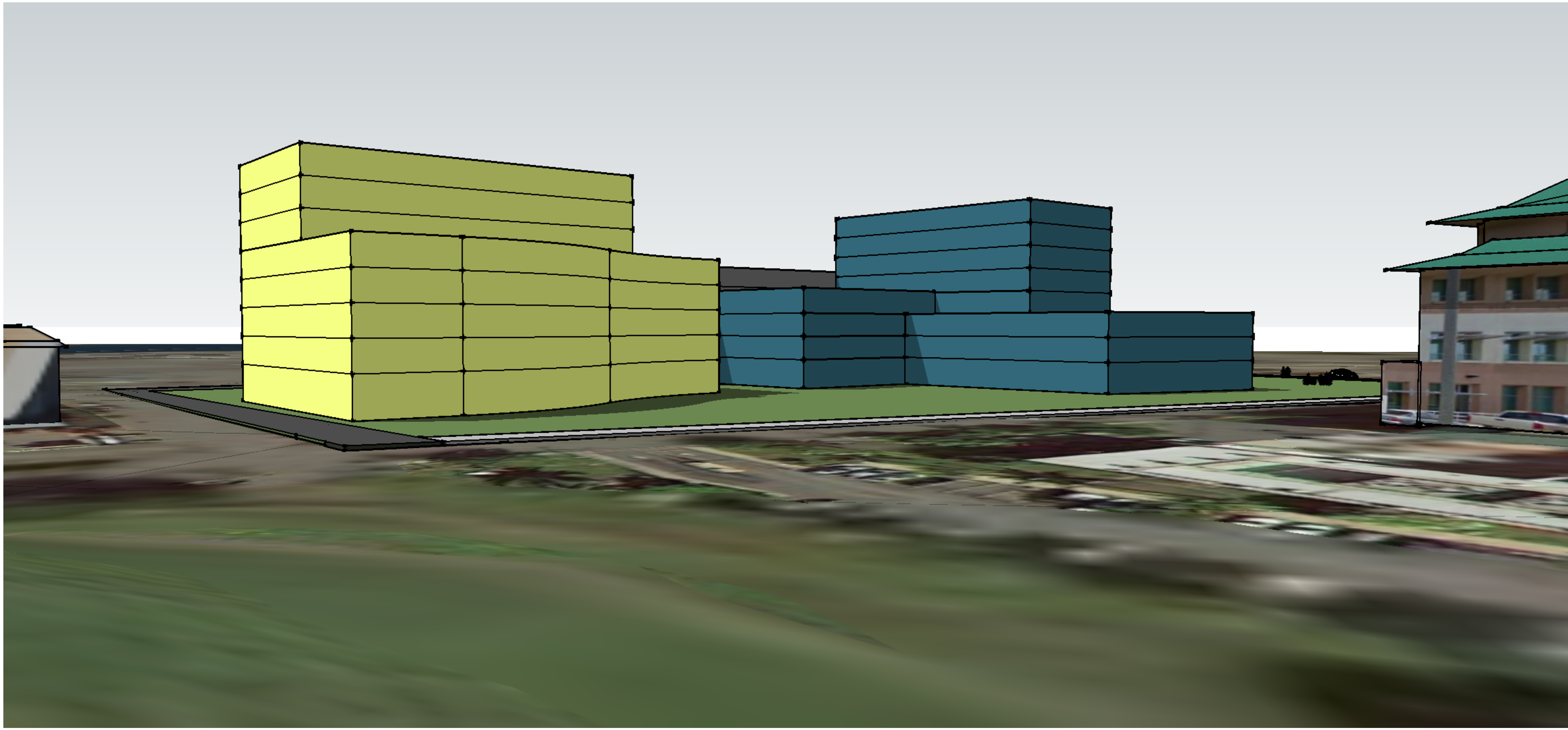
FERRARO CHOI



SCHEME G - 3D VIEW 2

KAKAAKO MAKAI INNOVATION BLOCK AT LOT “C” MASTER PLAN - 06.17.2015

FERRARO CHOI



SCHEME G - 3D VIEW 3

KAKAAKO MAKAI INNOVATION BLOCK AT LOT “C” MASTER PLAN - 06.17.2015

FERRARO CHOI

COLLABORATION CENTER
- 2 STORIES W/ LOFT SPACE
- 10,000 SF FOOTPRINT
- TOTAL AREA: 13,500 SF
- TOTAL HEIGHT: 36 FT.

COMMERCIAL FACILITY
FISHER HAWAII / DATA HOUSE:
- GROUND FLOOR WAREHOUSE - 22 FT.
- +2 STORY RETAIL / OFFICE - 26 FT.
- 42,900 SF FOOTPRINT
- SUBTOTAL: 65,280 SF

COMMERCIAL TOWER (LEASABLE):
- +6 STORIES - 78 FT.
- 15,120 SF FOOTPRINT
- SUBTOTAL: 90,720 SF

- TOTAL AREA: 156,000 SF
- TOTAL HEIGHT: 7 STORIES, 100 FT.

INNOVATION CENTER
- 3 STORIES
- 15,800 SF FOOTPRINT
- TOTAL AREA: 47,400 SF
- TOTAL HEIGHT: 55 FT.

EDUCATION FACILITY
- 4 STORY BASE - 56 FT.
- 22,250 SF FOOTPRINT

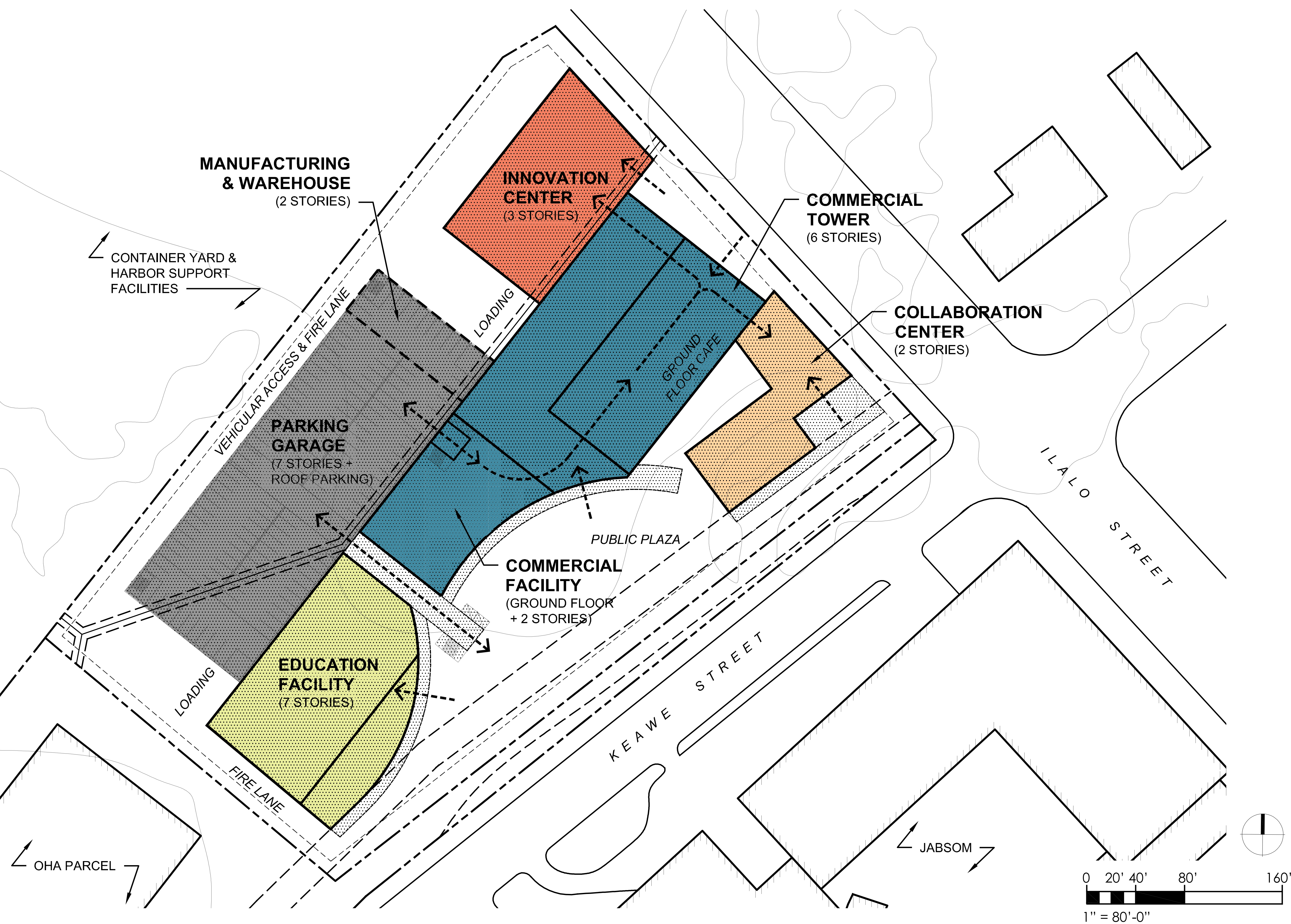
- +3 STORY TOWER - 44 FT.
- 17,000 SF FOOTPRINT

- TOTAL AREA: 140,000 SF
- TOTAL HEIGHT: 100 FT.

PARKING GARAGE
- 7 STORIES W/ ROOF DECK PARKING (12 FT. FLOOR TO FLOOR)
- 900 STALLS TOTAL
- SUBTOTAL: 314,800 SF

- MANUFACTURING & WAREHOUSE
- 2 STORIES (5,000 SF PER FLOOR)
- SUBTOTAL: 10,000 SF

- 40,600 SF FOOTPRINT
- TOTAL AREA: 324,800 SF
- TOTAL HEIGHT: 88 FT.



SCHEME H

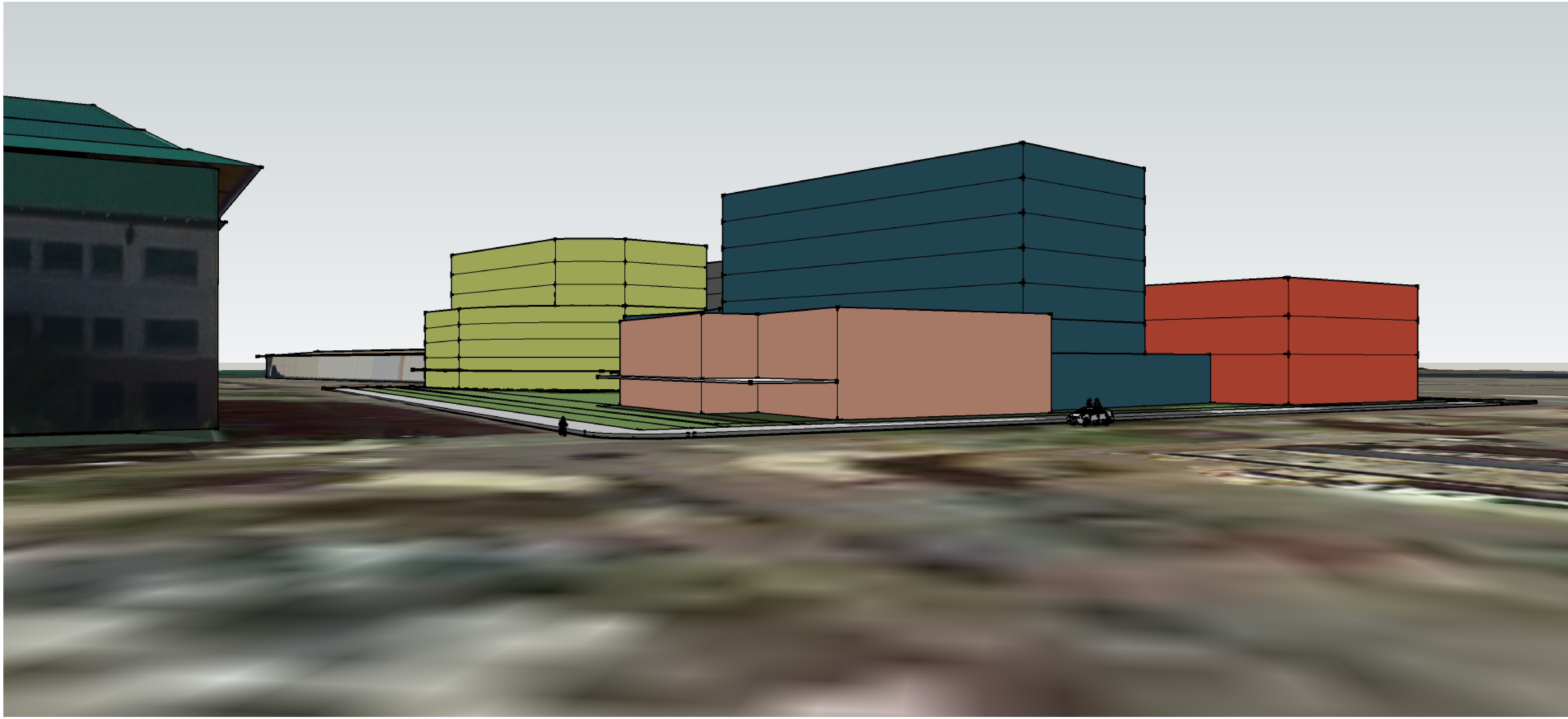
KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

FERRARO CHOI

SCHEME H - 3D VIEW 1

KAKAAKO MAKAI INNOVATION BLOCK AT LOT “C” MASTER PLAN - 06.17.2015

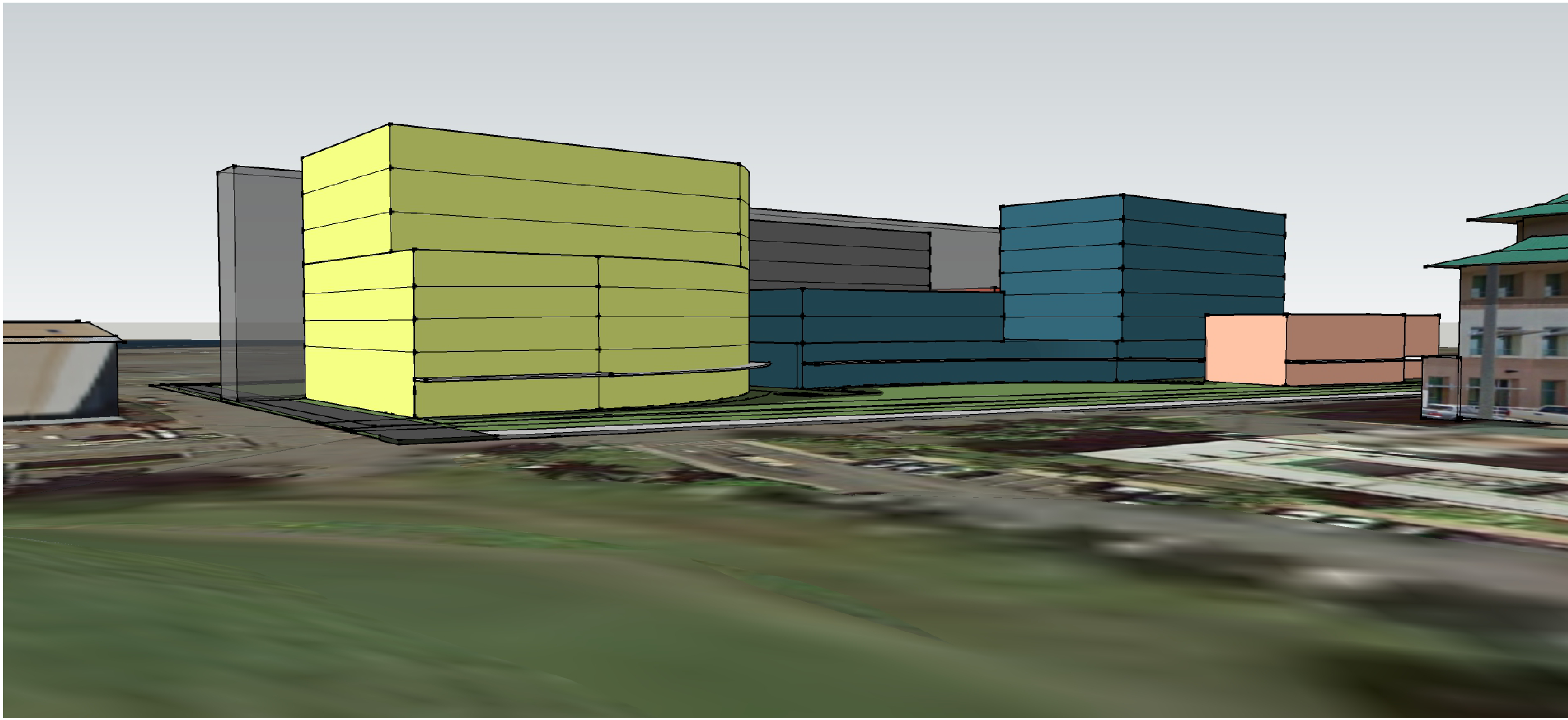
FERRARO CHOI



SCHEME H - 3D VIEW 2

KAKAAKO MAKAI INNOVATION BLOCK AT LOT "C" MASTER PLAN - 06.17.2015

FERRARO CHOI



SCHEME H - 3D VIEW 3

KAKAAKO MAKAI INNOVATION BLOCK AT LOT “C” MASTER PLAN - 06.17.2015

FERRARO CHOI

APPENDIX E:

Pre-Assessment Consultation
Comment and Response Letters

DEPARTMENT OF COMMUNITY SERVICES
CITY AND COUNTY OF HONOLULU
715 SOUTH KING STREET, SUITE 311 ● HONOLULU, HAWAII 96813 ● AREA CODE 808 ● PHONE: 768-7762 ● FAX: 768-7792

KIRK CALDWELL
MAYOR

GARY K. NAKATA
DIRECTOR DESIGNATE

BARBARA YAMASHITA
DEPUTY DIRECTOR

EM

July 1, 2015

RECEIVED
JUL 14 2015
WILSON OKAMOTO CORPORATION

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

Dear Mr. Matsukawa:

SUBJECT: Environmental Assessment (EA) Pre-Assessment Consultation
Hawaii Community Development Authority
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052

We have reviewed your letter dated June 17, 2015, and the enclosed Draft Environmental Assessment Pre-Assessment Consultation Project Summary for the Innovation Block at Lot C Master Plan.

Our review of the documents provided indicates that the proposed project will have no adverse impacts on any Department of Community Services' activities or projects at this time.

Thank you for providing us with the opportunity to comment on this matter.

Sincerely,

Gary K. Nakata
Director Designate

GKN:jc

WILSON OKAMOTO
CORPORATION

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808.946.2277
Fax: 808.946.2253
www.wilsonokamoto.com

10063-02
September 23, 2015

Mr. Gary Nakata
Acting Director
City and County of Honolulu
Department of Community Services
715 South King St.
Honolulu, Hawai'i 96813

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Mr. Nakata:

Thank you for your letter dated July 1, 2015 regarding the subject pre-assessment consultation. We appreciate that your review of the subject document indicates no adverse impacts of the proposed action are anticipated on any Department of Community Services' activities or projects at this time.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

EM

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

July 15, 2015

JUL 20 2015

Wilson Okamoto Corporation
1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii 96826

Attn: Earl Matsukawa

Dear Mr. Matsukawa:

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawaii Community Development Authority
Innovation Block at Lot C Master Plan
Tax Map Key: (TMK) [1] 2-1-015:052
Honolulu, Oahu, Hawaii

The Department of Design and Construction has noted an area of concern, please see attached.

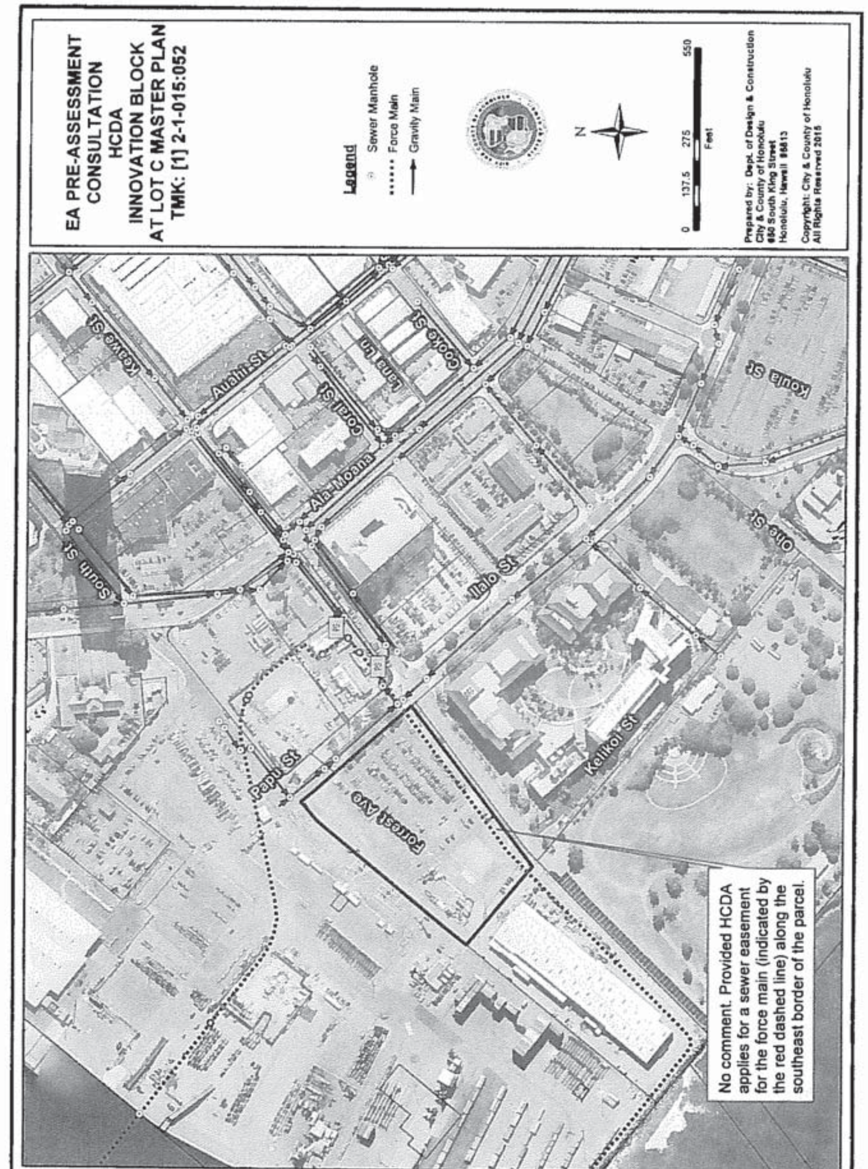
Thank you for the opportunity to review and comment. Should there be any questions, please contact Tina Ono of our Wastewater Division at 768-8766.

Sincerely,

Robert J. Kroning, P.E.
Director

RJK: cf (614038)

Enclosure



WILSON OKAMOTO
CORPORATION

1907 South Beretania Street
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Phone: 808.946.2277
Fax: 808.946.2253
www.wilsonokamoto.com

10063-02
September 23, 2015

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

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Mr. Kroning:

Thank you for your letter dated July 15, 2015 regarding the subject pre-assessment consultation. The Tax Map Key (TMK) for Lot C (2-1-015: 052) shows a sewer easement running along the southeast border of the parcel from Ilalo Street into the adjoining parcel (2-1-015:051) on the makai side. The Draft EA will discuss the presence of the existing sewer force main that runs in this identified easement. If there is a discrepancy in the property records regarding this easement, it can be addressed directly with the HCDA outside of the EA process.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
TELEPHONE: (808) 768-3486 ● FAX: (808) 768-3487 ● WEBSITE: http://envhonolulu.org

KIRK CALDWELL
MAYOR

LORI M.K. KAHIKINA, P.E.
DIRECTOR

TIMOTHY A. HOUGHTON
DEPUTY DIRECTOR

ROSS S. TANIMOTO, P.E.
DEPUTY DIRECTOR

IN REPLY REFER TO
PRO 15-106

July 10, 2015

Via e-mail: woc@wilsonokamoto.com

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

Dear Mr. Matsukawa:

SUBJECT: Environmental Assessment Pre-Assessment Consultation,
Hawaii Community Development Authority,
Innovation Block at Lot C Master Plan,
Honolulu, Oahu Hawaii
(TMK 2-1-015:052)

We have reviewed the subject document as transmitted to us by your letter received by our office on June 19, 2015. We have the following comments on the subject document:

1. The Department of Planning and Permitting (DPP), Wastewater Branch has the lead role in issuing sewer connection permits.

2. The City's existing Ala Moana Wastewater Pump Stations (WWPSs) No. 1 and No. 2 are across the street from the project site. Large diameter sewer trunk lines bring most of metro Oahu's wastewater to these WWPSs, where it is then pumped through three large force mains, which run by the project site, to the Sand Island Wastewater Treatment Plant. Although we expect there would normally be minimal impacts to the neighbors, there may occasionally be odors and noise from the WWPSs and the sewer lines, especially during periods of maintenance and construction activity, or should there be unplanned emergencies or other problems in the future. We recommend that the presence of the WWPSs adjacent to the project site be disclosed in the

Environmental Assessment document, and also to any future owners and tenants in this Innovation Block at Lot C project site.

Should you have any questions regarding our comments, please call Lisa Kimura, Civil Engineer, at 768-3455.

Sincerely,

Lori M.K. Kahikina, P.E.
Director

cc: Department of Planning and Permitting, SDD, WWB
Department of Design and Construction, WD, CSEB

WILSON OKAMOTO CORPORATION

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10063-02
September 23, 2015

Ms. Lori M. K. Kahikina, P.E.
Director
City and County of Honolulu
Department of Environmental Services
1000 Uluohia Street, Suite 308
Kapolei, Hawai'i 96707

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu. O'ahu, Hawai'i

Dear Ms. Kahikini:

Thank you for your letter dated July 10, 2015 regarding the subject pre-assessment consultation. We offer the following in response to your comments:

1. We acknowledge that the Department of Planning and Permitting, Wastewater Branch has the lead role in issuing sewer connection permits.

2. The Draft EA will discuss the proximity of the existing Ala Moana Wastewater Pump Stations (WWPSs) No.1 and No.2 to the project site and the potential for odors and noise to be generated from WWPSs and sewer lines, especially during periods of maintenance and construction activity, unplanned emergencies and other unexpected problems in the future. The HCDA has been apprised of your recommendation to disclose this potential odor issue with any future owners and tenants of the project site.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

WILSON OKAMOTO CORPORATION

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

Sincerely,

Earl Matsukawa

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

EM

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

KIRK CALDWELL
MAYOR

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

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 15-480

July 10, 2015

RECEIVED
JUL 14 2015
WILSON OKAMOTO CORPORATION

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

Dear Mr. Matsukawa:

SUBJECT: Environmental Assessment (EA) Pre-Assessment Consultation
Hawaii Community Development Authority
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, Oahu, Hawaii

Thank you for the opportunity to review and provide our input regarding your letter dated June 17, 2015, on the above subject project.

Our comments are as follows:

- Once construction phase commence, install approved Best Management Practices fronting all drainage facilities along Ilalo Street.
- During construction and upon completion of project, any damages/deficiencies to Ilalo Street 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

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Honolulu, Hawaii, 96826 USA
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10063-02
September 23, 2015

Mr. Ross S. Sasamura, P.E.
Director and Chief Engineer
City and County of Honolulu
Department of Facility Maintenance
Division of Road Maintenance
99-999 Iwaena Street
Aiea, HI 96701

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu. O'ahu, Hawai'i

Dear Mr. Sasamura:

Thank you for your letter dated July 10, 2015 regarding the subject pre-assessment consultation. We offer the following in response to your comments:

- The contract documents for the proposed project will require implementation of Best Management Practices to control erosion and sedimentation, including appropriate measures to minimize impacts on all affected drainage facilities along Ilalo Street.

- The contract documents will require that any damage to the Ilalo Street right-of-way incurred during construction be repaired. Project construction in the Ilalo Street right-of-way will be designed to meet City standards.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

WILSON OKAMOTO
CORPORATION

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

Sincerely,

Earl Matsukawa

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

EM

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
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DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

KIRK CALDWELL
MAYOR

GEORGE I. ATTA, FAICP
DIRECTOR

ARTHUR D. CHALLACOMBE
DEPUTY DIRECTOR

2015/ELOG-1240(tb)

July 17, 2015

JUL 20 2015

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

Dear Mr. Matsukawa:

Thank you for your letter dated June 17, 2015, regarding your request for comments on the pre-assessment consultation for the proposed Innovation Block at Lot C, Tax Map Key (TMK) 2-1-015: 052, located in the Kakaako Makai area. We have reviewed the project description and have the following comments:

1. The Draft Environmental Assessment (DEA) should include a discussion of the consistency of the project with the Oahu General Plan and the Primary Urban Center Development Plan.

2. The DEA should list all permits required from the City and County.

3. The DEA should address drainage and storm water quality impacts.

4. The DEA should include an analysis of the possible impact of sea level rise on the project. If it is likely that sea level rise will increase the risk of flooding during the life of the project structures, the DEA should discuss how the design of the project and proposed operations at the project site will address that risk and provide resilience in recovering from any flooding.

   The national standard for making such project assessments has been developed by the U. S. Army Corps of Engineers (USACE). The USACE issued an Engineering Circular (EC 1165-2-212) on December 13, 2013, 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 either the Honolulu or the Coconut Island National Oceanic and Atmospheric Administration tidal gauges. The tool can be used to quickly and easily provide Oahu-based low, intermediate, and high scenarios of potential relative sea level change from the present to 2100. The on-line sea level calculator is available at:
   http://www.corpsclimate.us/ccaceslcurves.cfm

   For further details on how the Engineering Circular and local tidal gauge information could be used to assess sea level rise risk for a local project, contact Mr. Michael Wong, Chief, Engineering and Construction Technical Branch, Army Corps of Engineers, Honolulu District (808-835-4138).

5. The DEA should address how the proposed project satisfies the design guidance of the Hawaii Community Development Authority Area Plan and the guiding principles and objectives of the Draft Kakaako Community Development District Transportation Oriented Development Overlay Plan, as the project site is approximately one-half mile from the planned Civic Center rail station.

Should you have any questions, please contact Thomas Blair at 768-8030.

Very truly yours,

for George I. Atta, FAICP
Director

GIA:js

WILSON OKAMOTO CORPORATION

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10063-02
September 23, 2015

Mr. George I. Atta
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
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Mr. Atta:

Thank you for your letter dated July 17, 2015 (2015/ELOG-1240(tb)) regarding the subject pre-assessment consultation. We offer the following in response to your comments:

1. The Draft EA will include a discussion of the proposed project's conformance with the O'ahu General Plan and Primary Urban Center Development Plan.

2. The Draft EA will include a list of permits and approvals that may be required from the city, state, and federal agencies.

3. The Draft EA will address drainage and storm water quality impacts related to project construction and operation activities.

4. Thank you for the information and recommendations pertaining to the DPP's efforts to address the impacts of sea level rise on development, as implemented through your land use regulatory processes. This information will be forwarded to the HCDA for consideration in reviewing development, including the proposed project, under their jurisdiction. The proposed project will comply with design standards required by the HCDA for this project.

5. The Draft EA will discuss the proposed project's compliance with the HCDA's Makai Area Plan. At this conceptual stage of the design process for the proposed project, however, it is premature to commit to specific design features that HCDA may require of the proposed project, particularly any that may derive from the Kakaako Community Development District Transit-Oriented Development (TOD) Overlay Plan for which the Final EIS has yet to be prepared and the TOD Overlay Plan yet to be adopted. Nevertheless, the TOD Overlay Plan, as presented in the Draft EIS will be discussed the forthcoming Draft EA for the proposed project.

WILSON OKAMOTO CORPORATION

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

EM

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

July 15, 2015

RECEIVED
JUL 24 2015
WILSON OKAMOTO CORPORATION

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

Dear Mr. Matsukawa:

SUBJECT: Environmental Assessment-Pre-Assessment Consultation
Hawaii Community Development Authority
Innovation Block at Lot C Master Plan
Tax Map Key (TMK) [1] 2-1-015:052
Honolulu, Oahu, Hawaii

Thank you for the opportunity to review and comment at the pre-assessment consultation stage of the environmental assessment for Hawaii Community Development Authority's Innovation Block at Lot C Master Plan project.

The Department of Parks and Recreation has no comment as the proposed project will have no impact on any of our program or facilities, you may remove us as a consulted party to the balance of the EIS process.

Should you have any questions, please contact Mr. John Reid, Planner at 768-3017.

Sincerely,

Michele K. Nekota
Director

MKN:jr
(614080)

WILSON OKAMOTO
CORPORATION

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Honolulu, Hawaii, 96826 USA
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10063-02
September 23, 2015

Ms. Michele K. Nekota
Director
City and County of Honolulu
Department of Parks and Recreation
1000 Uluhia Street, Suite 309
Kapolei, Hawai'i 96707

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Ms. Nekota:

Thank you for your letter dated July 15, 2015 regarding the subject pre-assessment consultation. We appreciate your determination that the proposed project will have no impact on any of your agency's programs or facilities. We also acknowledge that you have no further comments to offer and will not be consulting you, henceforth, in the EA process for this project.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Should you be interested, notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. You may use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

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

MICHAEL D. FORMBY
DIRECTOR

MARK N. GARRITY, AICP
DEPUTY DIRECTOR

TP6/15-614356R

July 9, 2015

EM

CEIVED
JUL 10 2015
OKAMOTO CORPORATION

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

Dear Mr. Matsukawa:

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment (DEA) for Innovation Block at Lot C Master Plan, Honolulu, Oahu, Hawaii

In response to your letter dated June 17, 2015, we have the following comments:

1. 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.

2. All parking needs for the proposed facilities (employees and visitors) should be handled on-site.

3. 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 paratransit vehicles on-site, which require a minimum 31-foot turning radius and a 10-foot, 6-inch height clearance.

4. On-site bicycle facilities for the project should be anticipated and accommodated.

5. All access driveways to the project site should be designed for pedestrian and bicycle safety.

6. The area Neighborhood Board, as well as the area residents, businesses, emergency personnel (fire, ambulance and police), should be kept apprised of the details of the proposed project and the impacts, particularly during construction, the project may have on the adjoining local street area network.

7. Any 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.

8. A street usage permit form 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 or sidewalk area on a City street.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Renee Yamasaki of my staff at 768-8383.

Very truly yours,

Michael D. Formby
Director

WILSON OKAMOTO CORPORATION

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10063-02
September 23, 2015

Mr. Michael Formby
Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaiʻi 96813

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawaiʻi Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, Oʻahu, Hawaii

Dear Mr. Formby:

Thank you for your letter dated July 9, 2015 (TP6/15-614356R) regarding the subject pre-assessment consultation. We offer the following in response to your comments:

1. The Draft EA will include a Traffic Impact Report (TIR), which will assess traffic impacts the proposed project may have on City roadway and State highway facilities in the vicinity. Traffic Management Plan(s) will be prepared at later stages of project design development when more detailed information about specific traffic circulation patterns becomes available. In the short-term, this will include construction vehicles for the proposed project, which will be developed in phases. In the long-term, this will include vehicles associated with the operation of the proposed project.

2. All HCDA parking requirements for the proposed project will be accommodated on-site, along with supplemental parking requirements for the John A. Burns School of Medicine and the University of Hawaii Cancer Center. Such supplemental parking is presently being accommodated at the project site.

3. All HCDA requirements for loading and unloading will be accommodated on-site, as will TheHandi-Van paratransit vehicle service. The operational dimensions you provided for para-transit vehicles have been forwarded to the project designers for incorporation in design plans.

4. The need for on-site bicycle facilities is anticipated and will be incorporated in project design plans.

5. The primary driveways for the project will be designed to safely accommodate pedestrians and bicycles. This is also in anticipation of multi-modal transportation needs associated with the future Honolulu Area Rapid Transit Station near the intersection of Halekauwila and South Streets.

WILSON OKAMOTO CORPORATION

6. The Ala Moana Kakaʻako Neighborhood Board No. 11 has and will continue to be consulted as part of this EA and subsequent Special Management Area Permit process. As the project moves into the construction phase, the Board, as well as area residents, businesses, and emergency services will be apprised of potential traffic and construction noise impacts.

7. The construction contractor will be required to transport construction materials and equipment to the project site during off-peak traffic hours (8:30 a.m. to 3:30 p.m.) to minimize potential disruption to traffic on local streets.

8. The construction contractor will be required to obtain a street usage permit from the Department of Transportation Services if any traffic lane or sidewalk area closures within the City's rights-of-way are needed.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

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

July 7, 2015

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

RECEIVED
JUL 10 2015
WILSON OKAMOTO CORPORATION

Dear Mr. Matsukawa:

Subject: Environmental Assessment Preassessment Consultation
Hawaii Community Development Authority
Innovation Block at Lot C Master Plan
Tax Map Key: 2-1-015: 052

In response to your letter dated June 17, 2015, regarding the above-mentioned subject, the Honolulu Fire Department (HFD) reviewed the material provided and requires that the following be complied with:

1. Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet 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]™, 2006 Edition, Section 18.2.3.2.2.)

   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 provides access to the interior of the building. (NFPA 1, UFC™, 2006 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™, 2006 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™, 2006 Edition, Section 18.2.3.4.1.1, as amended.)

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

Should you have questions, please contact Battalion Chief Terry Seelig of our Fire Prevention Bureau at 723-7151 or tseelig@honolulu.gov.

Sincerely,

Socrates D. Bratakos

SOCRATES D. BRATAKOS
Assistant Chief

SDB/SY:bh

WILSON OKAMOTO
CORPORATION

1907 South Beretania Street
Artesian Plaza, Suite 400
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Fax: 808.946.2253
www.wilsonokamoto.com

10063-02
September 23, 2015

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

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Assistant Chief Bratakos:

Thank you for your letter dated July 7, 2015 regarding the subject pre-assessment consultation.

Per your comments, the proposed project will comply with all applicable provisions set forth by the National Fire Protection Association's (NFPA) Uniform Fire Code (UFC). Civil drawings reflecting such compliance will be submitted to HFD for review and approval.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

EM

KIRK CALDWELL
MAYOR

LOUIS M. KEALOHA
CHIEF

DAVE M. KAJIHIRO
MARIE A. McCAULEY
DEPUTY CHIEFS

OUR REFERENCE MT-DK

July 9, 2015

RECEIVED JUL 14 2015 WILSON OKAMOTO CORPORATION

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

Dear Mr. Matsukawa:

This is in response to your letter of June 17, 2015, requesting comments on a Pre-Assessment Consultation, Draft Environmental Assessment, for the Hawaii Community Development Authority's proposed Innovation Block at Lot C Master Plan.

Based on the information provided, this project should have no significant impact on the services or operations of the Honolulu Police Department.

If there are any questions, please call Major Roy Sugimoto of District 1 (Central Honolulu) at 723-3327.

Thank you for the opportunity to review this project.

Sincerely,

LOUIS M. KEALOHA
Chief of Police

By
MARK TSUYEMURA
Management Analyst VI
Office of the Chief

WILSON OKAMOTO CORPORATION

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808.946.2277
Fax: 808.946.2253
www.wilsonokamoto.com

10063-02
September 23, 2015

Mr. Mark Tsuyemura
mtsuyemura@honolulu.gov
Honolulu Police Department
City and County of Honolulu
801 S. Beretania St.
Honolulu, Hawai'i 96813

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Mr. Tsuyemura:

Thank you for your letter dated July 9, 2015 regarding the subject pre-assessment consultation. We appreciate your determination that the proposed project will have no significant impact on the services or operations of the Honolulu Police Department.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 16, 2015

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

via email: woc@wilsonokamoto.com

Dear Mr. Matsukawa,

SUBJECT: Environmental Assessment (EA) Pre-Assessment Consultation, Hawaii Community Development Authority, Innovation Block at Lot C Master Plan

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from (1) Land Division – Oahu District; (2) Division of Forestry & Wildlife; (3) Division of Aquatic Resources; and (4) Engineering Division. No other comments were received as of our suspense date. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at 587-0439. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 24, 2015

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
__ Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__ Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – ~~Kauai~~ Oahu District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Assessment (EA) Pre-Assessment Consultation, Hawaii Community Development Authority, Innovation Block at Lot C Master Plan
LOCATION: Tax Map Key (TMK): [1] 2-1-015:052
APPLICANT: Hawai'i Community Development Authority by its consultant, Wilson Okamoto Corporation

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by July 15, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: [signature]
Print Name: [signature]
Date: 6/30/2015

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 24, 2015

RECEIVED
LAND DIVISION
2015 JUN 31 PM 2:57
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Assessment (EA) Pre-Assessment Consultation, Hawaii Community Development Authority, Innovation Block at Lot C Master Plan
LOCATION: Tax Map Key (TMK): [1] 2-1-015:052
APPLICANT: Hawai'i Community Development Authority by its consultant, Wilson Okamoto Corporation

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by July 15, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

(X) We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed:
Print Name: FRETZ
Date: 6/30/15

DAVID Y. IGE
GOVERNOR OF HAWAII

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

RECEIVED
LAND DIVISION
2015 JUL -7 PM 2:3
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 24, 2015

RECEIVED
JUN 29 2015
AQUATIC RESOURCES

DAR #5140

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

JK
AT

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Assessment (EA) Pre-Assessment Consultation, Hawaii Community Development Authority, Innovation Block at Lot C Master Plan
LOCATION: Tax Map Key (TMK): [1] 2-1-015:052
APPLICANT: Hawai'i Community Development Authority by its consultant, Wilson Okamoto Corporation

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by July 15, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed: Alton Miyasaka
Print Name: Alton Miyasaka, Acting Administrator
Date: 7-2-15

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
LAND DIVISION
2015 JUL -7 PM 3:07
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

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

KEKOA KALUHIWA
FIRST DEPUTY

W. ROY HARDY
ACTING DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

Date: July 2, 2015
DAR # 5140

MEMORANDUM

TO: Alton Miyasaka, Acting Administrator
DATE: 7-2-15
FROM: Annette Tagawa, Aquatic Biologist
SUBJECT: Kupu Green Job Training Center Renovations

Comment	Date Request	Receipt	Referral	Due Date
	June 24, 2015	June 29, 2015	July 1, 2015	July 15, 2015

Requested by: Russell Y. Tsuji, Land Administrator

Summary of Proposed Project

Title: Environmental Assessment (EA) Pre-Assessment Consultation, Innovation Block at Lot C Master Plan

Project by: Hawaii Community Development Authority (HCDA)

Location: Oahu Honolulu: TMK [1] 2-1-015:052

Brief Description: The HCDA will be partnering with private interest(s) to develop a commercial tower and warehouse. Future phases will include:

- Entrepreneur's Sandbox (approximately 13,500 SF)
- Innovation Hale (approximately 150,000 SF)
- Kewalo Incubation Center (KIC) (approximately 47,000 SF)
- Learning Center (approximately 140,000 SF)
- Regional Parking Garage (approximately 900 SF)

Initial work will include the Entrepreneur's Sandbox and Innovation Hale. Facilities for the Entrepreneur's Sandbox may include a creative lab, digital media production studio, training room, video conference room, HTDC mentor offices, "phone booth" areas, offices, meeting rooms, kitchen and break room, restrooms and horizontal and vertical circulation. The innovation Hale will be comprised of a five-story commercial tower intended for commercial office space erected on top of a two-story, low-rise commercial warehouse intended for commercial retail space.

Comments: The Division has no objections to the proposed project since it is not expected to have significant adverse impact on aquatic resource values in this area. However, as part of the Environmental Assessment, the Division would like see Best Management Practices addressed toward mitigation measures that include preventing any contaminants such as sediments, pollutants, petroleum products and other debris from possibly entering the aquatic environment during project activities. We also suggest that site work be scheduled during periods of minimal rainfall and lands denuded of vegetation be replanted or covered as quickly as possible to control erosion.

Thank you for providing DAR the opportunity to review and comment on the proposed project. We request the opportunity to review and comment on the prepared EA for any projects resulting from this planning process when it becomes available.

'15 JUN 29 AM 10:51 ENGINEERING

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 24, 2015

RECEIVED
LAND DIVISION
2015 JUL 14 AM 11:02
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM

~~TO:~~ FR:

DLNR Agencies:
X Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

~~FROM:~~ TO: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Assessment (EA) Pre-Assessment Consultation, Hawaii Community Development Authority, Innovation Block at Lot C Master Plan
LOCATION: Tax Map Key (TMK): [1] 2-1-015:052
APPLICANT: Hawai'i Community Development Authority by its consultant, Wilson Okamoto Corporation

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by July 15, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: [signature]
Print Name: Carty S. Chang, Chief Engineer
Date: 7/13/15

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/ Russell Y. Tsuji
REF: EA Pre-Assessment Consultation for HCDA Innovation Block at Lot C Master Plan
Oahu.046

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) Please take note that the project site according to the Flood Insurance Rate Map (FIRM), is located in Zone X. The National Flood Insurance Program (NFIP) does not regulate developments within Zone X.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Carter Romero (Acting) at (808) 961-8943 of the County of Hawaii, Department of Public Works.
( ) Mr. Carolyn Cortez at (808) 270-7253 of the County of Maui, Department of Planning.
( ) Mr. Stanford Iwamoto at (808) 241-4896 of the County of Kauai, Department of Public Works.

(X) Please note that the implementation of any State-sponsored project requiring water service from the Honolulu Board of Water Supply (HBWS) system should first obtain water allocation credits from the Engineering Division before contacting HBWS for water service and/or water meter.

(X) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update. Also, provide the infrastructure required to meet water demands.

( ) Additional Comments: ______

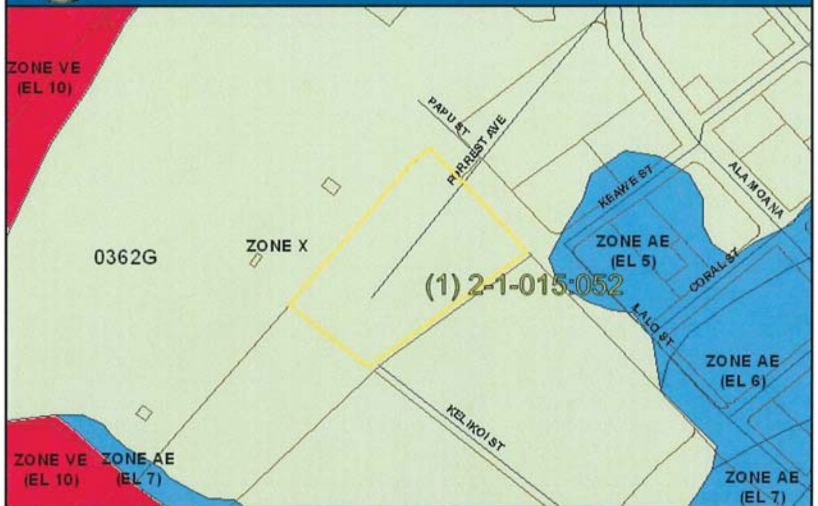
( ) Other: ______

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed: [signature]
CARTY S. CHANG, CHIEF ENGINEER
Date: 7/13/15

State of Hawaii

FLOOD HAZARD ASSESSMENT REPORT



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD ZONE DEFINITIONS

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD – The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water-surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

- **Zone A:** No BFE determined.
- **Zone AE:** BFE determined.
- **Zone AH:** Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- **Zone AO:** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- **Zone V:** Coastal flood zone with velocity hazard (wave action); no BFE determined.
- **Zone VE:** Coastal flood zone with velocity hazard (wave action); BFE determined.
- **Zone AEF:** Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA – An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- **Zone XS (X shaded):** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- **Zone X:** Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

- **Zone D:** Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

PROPERTY INFORMATION

COUNTY:	HONOLULU
TMK NO:	(1) 2-1-015-052
PARCEL ADDRESS:	
FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL(S):	15003C0362G
PANEL EFFECTIVE DATE:	JANUARY 19, 2011
PARCEL DATA FROM:	APRIL 2014
IMAGERY DATA FROM:	MAY 2006

IMPORTANT PHONE NUMBERS

County NFIP Coordinator City and County of Honolulu Mario Siu-Li, CFM	(808) 768-8098
State NFIP Coordinator Carol Tyau-Beam, P.E., CFM	(808) 587-0267

Disclaimer: The Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use of the information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR from any liability, which may arise from its use.

If this map has been identified as 'PRELIMINARY' or 'UNOFFICIAL', please note that it is being provided for informational purposes and is not to be used for official/legal decisions, regulatory compliance, or flood insurance rating. Contact your county NFIP coordinator for flood zone determinations to be used for compliance with local floodplain management regulations.

WILSON OKAMOTO CORPORATION

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808.946.2277
Fax: 808.946.2253
www.wilsonokamoto.com

10063-02
September 23, 2015

Mr. Russell Y. Tsuji
Land Administrator
Department of Land and Natural Resources
Land Division
P.O. Box 621
Honolulu, Hawai'i 96809

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Mr. Tsuji:

Thank you for your e-mail transmittals dated July 16, 2015 regarding the subject pre-assessment consultation. We offer the following responses to the various DLNR agency comments you forwarded to us:

<u>Land Division, Oahu District</u>
We acknowledge that the Land Division has no comments to offer at this time.

<u>Division of Forestry & Wildlife</u>
We acknowledge that the Division of Forestry and Wildlife has no objections regarding the proposed project at this time.

<u>Engineering Division</u>
We appreciate your confirmation that the project site is located within Zone X according to the Flood Insurance Rate Map (FIRM) and, therefore, is not regulated by the National Flood Insurance Program (NFIP).

Since the project will be served by the Honolulu Board of Water Supply (HBWS), the HCDA will consult the Engineering Division to obtain water allocation credits before contacting the HBWS for water service and/or water meter. The HCDA will also provide water demands and calculations to the Engineering Division when they become available. The transmission infrastructure for water will be designed to meet projected water demand.

<u>Aquatic Resources Division</u>
A separate response letter was prepared for the Aquatic Resources Division's comments (See Attachment)

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's

(OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

Attachment

WILSON OKAMOTO CORPORATION
1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808.946.2277
Fax: 808.946.2253
www.wilsonokamoto.com

10063-02
September 23, 2015

Ms. Annette Tagawa
Aquatic Biologist
Department of Land and Natural Resources
Division of Aquatic Resources
P.O. Box 621
Honolulu, Hawaiʻi 96809

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawaiʻi Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, Oʻahu, Hawaii

Dear Ms. Tagawa:

Thank you for your letter dated July 16, 2015 (DAR # 5140) regarding the subject pre-assessment consultation. We offer the following response to your comments:

We acknowledge that the Division of Aquatic Resources (DAR) has no objections to the project as it is unlikely to have significant impacts on aquatic resources. The Draft EA will discuss the use of Best Management Practices (BMP) to control erosion and sedimentation. At this stage of the project, however, specific mitigation measures have yet to be developed. An erosion control plan will be prepared for the civil engineering design and the project will require a National Pollutant Discharge Elimination System (NPDES) permit for storm water runoff from construction activities. The NPDES permit application will require a BMP plan. Since the project will be developed in phases, the amount of soil exposed to storm conditions at a given time will be limited and the NPDES is intended to address storm water runoff.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

DAVID Y. IGE
GOVERNOR

BRIGADIER GENERAL ARTHUR J. LOGAN
DIRECTOR OF EMERGENCY MANAGEMENT

DOUG MAYNE
ADMINISTRATOR OF EMERGENCY MANAGEMENT

PHONE (808) 733-4300
FAX (808) 733-4287

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE DIRECTOR OF CIVIL DEFENSE / EMERGENCY MANAGEMENT
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

June 22, 2015

RECEIVED
JUN 25 2015
WILSON OKAMOTO CORPORATION

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

Dear Mr. Matsukawa:

Innovation Block at Lot C Master Plan
Hawaii Community Development Authority
Environmental Assessment Pre-Assessment Consultation

Thank you for the opportunity to comment on this proposed project.

After review of the documents provided for the subject project, we have determined that the proposed project area falls within coverage arcs of existing warning sirens. We anticipate reviewing the Draft Environmental Assessment upon its completion.

If you have any questions, please call Ms. Havinne Okamura, Hazard Mitigation Planner, at (808) 733-4300, extension 556.

Sincerely,

DOUG MAYNE
Administrator of Emergency Management

WILSON OKAMOTO
CORPORATION

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808.946.2277
Fax: 808.946.2253
www.wilsonokamoto.com

10063-02
September 23, 2015

Mr. Doug Mayne
Administrator of Emergency Management
Department of Defense
Office of the Director of Civil Defense / Emergency Management
3949 Diamond Head Road
Honolulu, Hawai'i 96816

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Mr. Mayne:

Thank you for your e-mail transmittals dated June 22, 2015 regarding the subject pre-assessment consultation. We appreciate your determination that the proposed project area falls within coverage arcs of existing warning sirens.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

DAVID Y. IGE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

ARTHUR J. LOGAN
MAJOR GENERAL
ADJUTANT GENERAL

KENNETH S. HARA
COLONEL
DEPUTY ADJUTANT GENERAL

EM

July 22, 2015

JUL 27 2015

Wilson Okamoto Corporation
1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawai'i 96826

Attn.: Mr. Earl Matsukawa, AICP

Subject: Environmental Assessment (EA) Pre-Assessment Consultation, Hawaii Community Development Authority, Innovation Block at Lot C Master Plan, TMK: [1] 2-1-015:052, Honolulu, Oahu, Hawaii.

Dear Mr. Matsukawa,

Thank you for the opportunity to comment on the above project and we apologize for this late response. The State of Hawaii Department of Defense has no comments to offer relative to the project.

If you have any questions or concerns, please have your staff contact Mr. Lloyd Maki, Assistant Chief Engineering Officer at (808) 733-4250.

Sincerely,

FOR ARTHUR J. LOGAN
Major General
Hawaii National Guard
Adjutant General

c: Ms. Havinne Okamura, Hawaii Emergency Management Agency

WILSON OKAMOTO
CORPORATION

1907 South Beretania Street
Artesian Plaza, Suite 400
Honolulu, Hawaii, 96826 USA
Phone: 808.946.2277
Fax: 808.946.2253
www.wilsonokamoto.com

10063-02
September 23, 2015

Mr. Arthur J. Logan
Mayor General, Hawai'i National Guard
Department of Defense
Office of the Adjutant General
3949 Diamond Head Road
Honolulu, Hawai'i 96816

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Mr. Logan:

Thank you for your letter dated July 22, 2015 regarding the subject pre-assessment consultation. We acknowledge that the State Department of Defense has no comments to offer relative to this project.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

EM

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:
EMD/CWB

06047PNN.15

June 29, 2015

RECEIVED
JUL 02 2015
WILSON OKAMOTO CORPORATION

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

Dear Mr. Matsukawa:

SUBJECT: Comments on the Environmental Assessment (EA) Pre-Assessment Consultation for the Hawaii Community Development Authority Innovation Block at Lot C Master Plan Honolulu, Island of Oahu, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated June 17, 2015, requesting comments on your project. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55).

For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee ($1,000 for an individual NPDES permit or $500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the appropriate form. Follow the instructions to complete and submit the form.

3. If your project involves work in, over, or under waters of the United States, it is highly recommended that you contact the Army Corp of Engineers, Regulatory Branch (Tel: 835-4303) regarding their permitting requirements.

   Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:

   a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g., minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.

c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.

d. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.

e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

If you have any questions, please visit our website at:
http://health.hawaii.gov/cwb, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

Alec Wong

ALEC WONG, P.E., CHIEF
Clean Water Branch

NN:ay

WILSON OKAMOTO
CORPORATION

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10063-02
September 23, 2015

Mr. Alec Wong, P.E., Chief
State of Hawai'i
Department of Health
Clean Water Branch
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Mr. Wong:

Thank you for your letter dated June 29, 2015 (EMD/CWB 06047PNN.15) regarding the subject pre-assessment consultation. We offer the following responses to your numbered comments:

1. We appreciate the information provided regarding the anti-degradation policy, designated uses, and water quality criteria applicable to any project and its associated impact on State waters (Chapter 11-54, HAR). The project will comply with applicable provisions.

2. Thank you for the information on National Pollutant Discharge Elimination System (NPDES) provisions. It is anticipated that an NPDES permit for construction storm water discharges will be required for this project. Prior to the start of construction, coordination will be undertaken with the Department of Health on all applicable requirements.

3. The proposed project will not involve work in, over, or under waters of the United States.

4. We acknowledge that all discharges related to project construction or operation activities, regardless of coverage by the NPDES permit for this project, must comply with the State's Water Quality Standards.

5. The proposed project will incorporate design features that will reduce, reuse and recycle to project, restore and sustain water quality and beneficial uses of State Waters. All of your recommendations for doing so have been forwarded to the project designers for incorporation, as appropriate, in the design plans.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

tm

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 15-147

July 10, 2015

RECEIVED
JUL 20 2015

Mr. Earl Matsukawa
Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826
woc@wilsonokamoto.com

Dear Mr. Matsukawa:

SUBJECT: Pre-Consultation for Draft Environmental Assessment (PC DEA) for HCDA Innnovation Block at Lot C, Honoulu, Oahu
TMK: (1) 2-1-015:052

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your PC DEA to our office on June 17th, 2015. Thank you for allowing us to review and comment on the proposed project. The PC DEA was routed to the Clean Water Branch, and the Hazard Evaluation and Emergency Response Office. They will provide specific comments to you if necessary. EPO recommends that you review the standard comments and available strategies to support sustainable and healthy design provided at: http://health.hawaii.gov/epo/home/landuse-planning-review-program. Projects are required to adhere to all applicable standard comments.

We encourage you to examine and utilize the Hawaii Environmental Health Portal. The portal 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 Portal is continually updated. Please visit it regularly at: https://eha-cloud.doh.hawaii.gov

You may also wish to review the revised Water Quality Standards Maps that have been updated for all islands. The Water Quality Standards Maps can be found at: http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/water-quality-standards

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design.

Mahalo nui loa,

Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

c: Anthony Ching, HCDA
CWB, HEER {via email only}

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10063-02
September 23, 2015

Ms. Laura Leialoha Phillips McIntyre, AICP
Program Manager
Department of Health
Environmental Planning Office
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Ms. McIntyre:

Thank you for your letter dated July 10, 2015 (EPO 15-147) regarding the subject pre-assessment consultation. We offer the following in response to your comments:

The proposed project will adhere to all applicable standard comments outlined in the URL link provided in your letter. Further, the Department of Health's Hawai'i Environmental Health Portal and the updated Water Quality Standards Maps will be utilized as a reference resource throughout the design process for the subject project.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

EW

DAVID Y. IGE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
AIRPORTS DIVISION
400 RODGERS BOULEVARD, SUITE 700
HONOLULU, HAWAII 96819-1880

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
AIR-EP
15.0062

July 13, 2015

JUL 20 2015

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

Dear Mr. Matsukawa:

Subject: Innovation Block at Lot C Master Plan
Environmental Assessment (EA) Pre-Assessment Consultation
Hawaii Community Development Authority

We have reviewed the subject project and have the following comments:

- The development is within the transitional approach surface to the Honolulu International Airport and therefore will be subject to overflights.
- It is our understanding that the Innovation Hale will be five (5) stories high, which will be erected on top of a two (2) story warehouse, making it a total of seven (7) stories high.
- The developer is required to file Federal Aviation Administration (FAA) Form 7460-1, "Notice of Proposed Construction or Alteration" if they have not already done so. This form can be filed online at https://oeaaa.faa.gov/oeaaaexternal/portal.jsp.
- While the proposed building is at the same height or below existing buildings within the vicinity, we are still very concerned on the cumulative impact of the number of buildings in the event of a one-engine inoperative (OEI) emergency procedure for commercial aircraft. This OEI procedure needs to be examined further and taken into account in terms of the height and location of the building.
- Please note that if solar panels are being considered, photovoltaic (PV) systems located in or near the approach path of aircraft into an airport, can create a hazardous condition for a pilot due to possible glint and glare reflected from the PV array, and a glint/glare analysis needs to be completed. Please refer to the following website www.sandia.gov/glare to assist you with the preparation of a glint and glare analysis.

Thank you for providing us the opportunity to review this proposal. Should you have any questions regarding the above, please contact Mr. Jeffrey Chang, Engineering Program Manager, at 838-8835.

Sincerely,

ROSS M. HIGASHI
Deputy Director – Airports Division

c: Mr. Ronnie V. Simpson, Federal Aviation Administration
Airlines Committee Hawaii

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10063-02
September 23, 2015

Mr. Ross M. Higashi, Deputy Director
Department of Transportation – Airport Division
State of Hawaii
869 Punchbowl Street
Honolulu, Hawai'i 96813-5097

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Mr. Higashi:

Thank you for your letter dated July 13, 2015 (AIR-EP 15.0062) regarding the subject pre-assessment consultation. We offer the following response to your comments:

- We acknowledge that the proposed project will be within the transitional approach surface to the Honolulu International Airport, and subject to overflights.

- As required, the applicant will file a FAA Form 7460-1 "Notice of Proposed Construction or Alteration" with the Federal Aviation Administration for the proposed project. The FAA Form 7460-01 will be listed in the Drat EA as a required approval.

- We acknowledge your concerns regarding the proposed project's addition to buildings of comparable height in the vicinity that maybe affected in the event of a one-engine inoperative (OEI) emergency procedure for commercial aircraft. Since building heights in the Kakaako Makai Area are established by Hawaii Community Development Authority's (HCDA) rules for the Area, your concern could be comprehensively addressed by examining if the rules governing building heights are an aviation safety issue. A flight track analysis for OEI procedures based on allowable building heights in affected areas should be provided to the HCDA for consideration.

- Your recommendation to determine if a glint and glare analysis is necessary and your URL link reference for preparing such an analysis at the Solar Glare and Flux Mapping Tools website will be forwarded to the project designers for consideration. At this point in the design of the proposed project, the use of photovoltaic (PV) arrays on roof tops has yet to be determined.

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Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

DAVID Y. IGE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:

STP 8.1827

July 22, 2015

RECEIVED
JUL 29 2015
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: Innovation Block at Lot C Master Plan
Environmental Assessment (EA) Pre-Assessment Consultation
Honolulu, Oahu
TMK: (1) 2-1-015:052

Our Department of Transportation's (DOT) comments on the subject project are as follows:

Airports Division

The proposed site of the Innovation Block at Lot C Master Plan is located within the 70-65 DNL (day-night average sound level) noise contour on the Honolulu International Airport 5-Year (2008) Noise Exposure Map (see attached). The proposed buildings will be subject to noise from aircraft arriving and departing Honolulu International Airport, therefore we highly recommend the rooms, labs and studios in the buildings are sound attenuated to an interior noise level of 45 DNL due to its noise sensitive use.

Harbors Division

1. The proposed development is adjacent to an operational commercial harbor and will be exposed to noise, light, and fumes associated with commercial operations.

2. All phases of development should be coordinated with Harbors Division.

3. Forrest Avenue provides access to Piers 1 and 2. Circulation to and from the site should be coordinated with Harbors Division. Increased traffic congestion that may impact harbor operations is a concern.

4. With 900 new parking stalls and the new commercial use of the space, it is likely that pedestrian, bike and auto traffic will increase along Forrest Avenue which may conflict with truck traffic associated with commercial cargo operations. We request that the EA address this issue.

5. In the case of an emergency, in which the main harbor channel is blocked, Pier 1 would be the first deep draft pier needed to resume harbor operations. If this were to occur it would intensify operations at Piers 1 and 2 and increase traffic on Forrest Avenue.

Highways Division

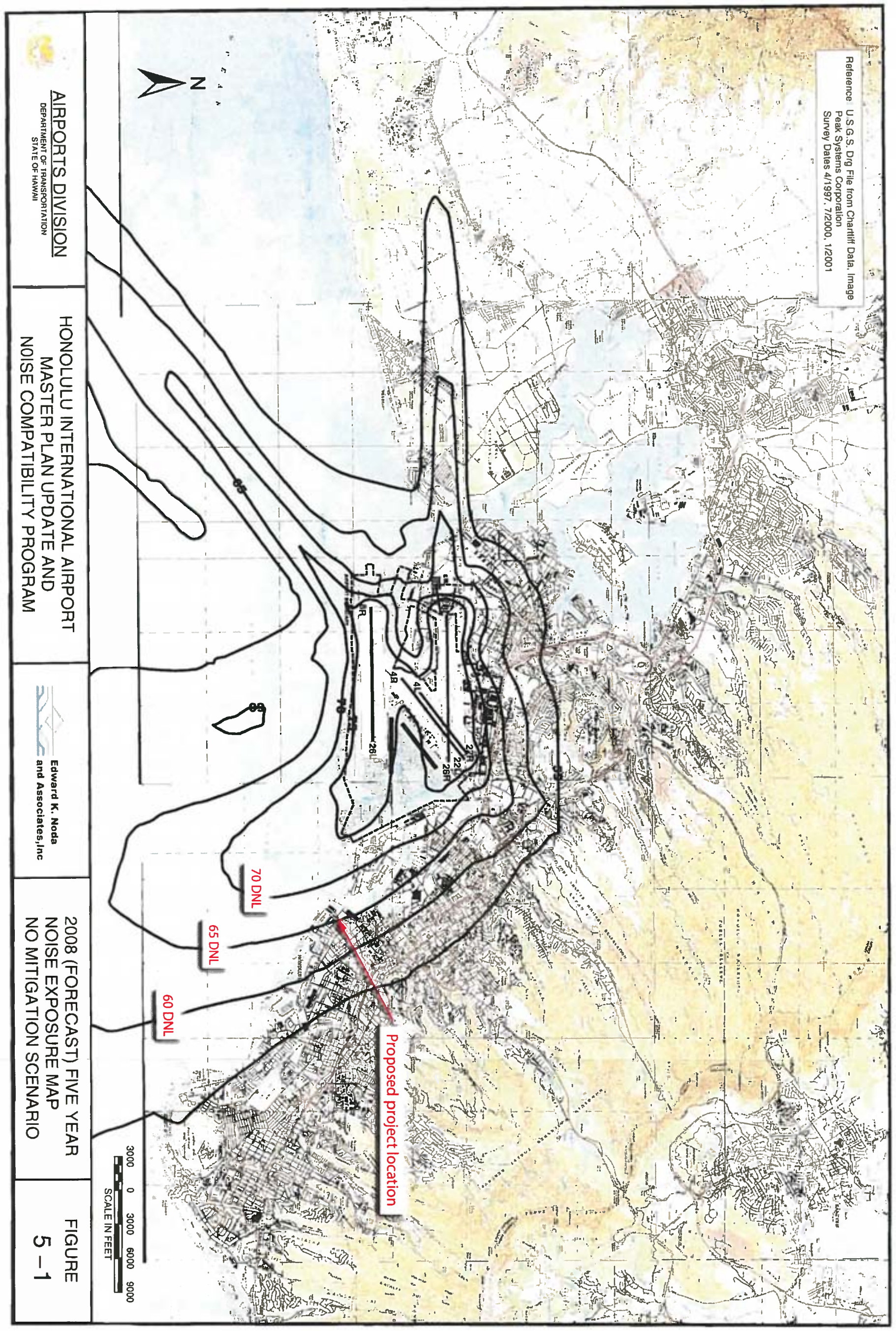
The Traffic Impact Analysis Report (TIAR) should discuss and evaluate the project's contribution to the cumulative traffic impacts on the State highway facility in the area (Ala Moana Boulevard). The TIAR shall be submitted to the Highways Division for review and acceptance.

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Sincerely,

For FORD N. FUCHIGAMI
Director of Transportation

Attachment: 5-Year Noise Exposure Map



Innovation Block at Lot C Master Plan

WILSON OKAMOTO
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10063-02
September 23, 2015

Mr. Ford N. Fuchigami
Director
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai'i 96813

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Mr. Fuchigami:

Thank you for your letter dated July 22, 2015 regarding the subject pre-assessment consultation. We offer the following responses to the various DOT agency comments you forwarded to us:

Airports Division
We have forwarded your aircraft noise attenuation recommendation to the project designers for consideration.

Harbor Division
1. We acknowledge that the proximity of the proposed project to an existing commercial harbor potentially exposes it to noise, lights and fumes associated with on-going harbor operations. The HCDA is aware of this situation and has advised the High Technology Development Corporation (HTDC). HCDA will also apprise prospective future occupants of subsequent phases of development at the project site.

2. The HCDA will maintain communication with the Harbors Division throughout all phases of proposed development at the project site to minimize potential impacts on harbor operations.

3. We acknowledge your concern regarding potential traffic impacts of the proposed project on access to Piers 1 and 2 along Forrest Avenue. A Traffic Impact Report (TIR) has been prepared and will be included in the Draft EA for your review.

4. Traffic associated with the development and operation of the proposed project is not anticipated to utilize Forrest Avenue, however, such traffic will use Ilalo Street near its intersection with Forrest Avenue. As previously stated, a TIR will be included in the Draft EA for your review.

5. HCDA is aware of emergency conditions that may prompt Pier 1 to become the first deep draft pier needed to resume operations after a shutdown affecting Honolulu Harbor. While such a temporary increase in traffic volume along Forrest

WILSON OKAMOTO CORPORATION

Avenue is not assessed in the TIR, a traffic management plan for such a situation could be prepared based on conditions that result from such an emergency.

Highways Division
The Draft EA will include a TIR assessing traffic impacts that proposed project may have on the roadways in the vicinity, including Ala Moana Boulevard.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

DAVID Y. IGE
Governor

SHAN S. TSUTSUI
Lieutenant Governor

LUIS P. SALAVERIA
Director

LAND USE COMMISSION
Department of Business, Economic Development & Tourism
State of Hawai'i

DANIEL ORODENKER
Executive Officer

BERT K. SARUWATARI
Planner

SCOTT A.K. DERRICKSON
Planner

RILEY K. HAKODA
Planner/Chief Clerk

FRED A. TALON
Drafting Technician

EM

June 19, 2015

RECEIVED
JUN 2 ? 2015
WILSON OKAMOTO CORPORATION

Mr. Earl Matsukawa, AICP
Project Manager
Wilson Okamoto Corporation
1907 S. Beretania Street
Artesian Plaza, Suite 400
Honolulu, HI 96826

Dear Mr. Matsukawa,

Thank you for your request for comments regarding the Draft Environmental Assessment regarding the Hawaii Community Development Authority (HCDA) Innovation Bloak at Lot C Master Plan.

The Land Use Commission has no comments on this matter at this time.

Sincerely,

Daniel Orodenker
Executive Officer

WILSON OKAMOTO
CORPORATION

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Honolulu, Hawaii, 96826 USA
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10063-02
September 23, 2015

Mr. Daniel Orodenker
Executive Officer
Department of Business, Economic Development & Tourism
Land Use Commission
P. O. Box 2359
Honolulu, Hawai'i 96804

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Mr. Orodenker:

Thank you for your letter dated June 19, 2015 regarding the subject pre-assessment consultation. We acknowledge that the Land Use Commission has no comments at this time.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

DAVID Y. IGE
GOVERNOR OF HAWAII

JESSICA E. WOOLEY
DIRECTOR

EM

STATE OF HAWAI'I
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
Department of Health
235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813
Telephone (808) 586-4185
Facsimile (808) 586-4186
Email: oeqchawaii@doh.hawaii.gov

July 24, 2015

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, Hawai'i 96826
Attn: Mr. Earl Matsukawa, Project Manager

Dear Mr. Matsukawa

SUBJECT: Early Consultation Request re: Draft Environmental Assessment (EA) for proposed Innovation Block at Lot C Master Plan, Kaka'ako, O'ahu

Our Office of Environmental Quality Control has reviewed the information contained in your June 17, 2015, letter about the subject project, and we offer the following comments for your consideration. We apologize for the delay in responding to your letter.

Pursuant to Chapter 343, Hawai'i Revised Statues, and the provisions of Chapter 11-200, Hawai'i Administrative Rules, as an Agency Action by the State of Hawai'i, Hawai'i Community Development Authority, this agency would be considered the "Proposing and Determination agency" that implements the environmental review process for this project by either 1) anticipating a Finding of No Significant Impact and then preparing a Draft EA for public review and comment, or 2) based on their judgment and experience, deciding to by-pass the EA step and proceeding directly to the Environmental Impact Statement (EIS) Preparation Notice step if significant effects may or will occur from the project. In the event that the agency makes a determination to prepare an EIS, either initially or if significant impacts are identified in the Final EA, then the Governor, as the "accepting authority," would determine the acceptability of the subsequent Final EIS.

The information presented in your solicitation letter indicates the project site will be developed in phases, and briefly notes 5 project elements, which are graphically depicted on the included Site Plan. Initial work will include 2 of those elements, namely the Entrepreneur's Sandbox and the Innovation Hale, for which some additional information is offered. While limited information about parking for these 2 elements is provided, it is unclear how this parking relates to the 900-stall Regional Parking Garage listed as another of the 5 main project elements. We suggest the Draft EA for the project clarify

this parking situation, as well as other issues related to project phasing, to identify which project elements are analyzed in the Draft EA and which are not.

As you prepare to submit documents for publication and public review in The Environmental Notice, we appreciate your diligence in using the correct and recently revised publication forms available online. If you have any questions as you navigate this process, please consult our website at http://health.hawaii.gov/oeqc (see in particular the link to the Environmental Assessment Preparation Toolkit on the right panel) or contact our office at (808) 586-4185.

Sincerely,

Jessica Wooley

Jessica Wooley
Director

WILSON OKAMOTO CORPORATION

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10063-02
September 23, 2015

Ms. Jessica Wooley
Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Ms. Wooley:

Thank you for your letter dated July 24, 2015 regarding the subject pre-assessment consultation. We offer the following responses to your comments:

1. We acknowledge and concur with your explanation of procedures for preparing environmental review documents under Chapter 343, Hawaii Revised Statutes and Chapter 11-200, Hawaii Administrative Rules for the proposed agency action. The HCDA intends to file a Draft EA with an anticipated Finding of No Significant Impact following this pre-assessment consultation process.

2. The Draft EA will include an explanation of project phasing and how parking requirements for the initial project components, as well as existing supplemental parking at the project site for the John A. Burns School of Medicine and the University of Hawaii Cancer Center, will be accommodated until the regional parking garage and the remaining project phases are built-out.

3. We will file the forthcoming Draft EA with your office utilizing the recently revised publication forms accessible through the OEQC URL link provided in your letter.

WILSON OKAMOTO CORPORATION

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

OFFICE OF PLANNING
STATE OF HAWAII

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
ACTING DIRECTOR
OFFICE OF PLANNING

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

EM

Ref. No. P-14800

June 30, 2015

RECEIVED
JUL 06 2015
WILSON OKAMOTO CORPORATION

To: Anthony J.H. Ching, Executive Director
Hawaii Community Development Authority

From: Leo R. Asuncion, Acting Director

Subject: Environmental Assessment Pre-Assessment Consultation, Hawaii Community Development Authority Innovation Block at Lot C Master Plan, Kaka'ako, Honolulu, Oahu, Hawaii; Tax Map Key: (1) 2-1-015: 052

Thank you for the opportunity to provide comments on the preparation of an Environmental Assessment (EA) for the proposed Innovation Block at Lot C Master Plan within the Makai Area of the Kaka'ako Community Development District. My office received the subject EA pre-consultation request on June 19, 2015.

According to the summary of the proposal and associated figures, the Hawaii Community Development Authority (HCDA), in collaboration with the High Technology Development Corporation, proposes the subject Master Plan to develop the land in phases, including: 1) Entrepreneur's Sandbox; 2) Innovation Hale; 3) Kewalo Incubation Center; 4) Learning Center; and 5) Regional Parking Structure. The 5.511-acre parcel, which is referred to as Lot C, is presently used as a paved at-grade parking lot serving the John A. Burns School of Medicine Makai Campus and University of Hawaii Cancer Center.

The proposed plan will involve the use of State lands and funds, which triggers the requirements of Hawaii Revised Statutes (HRS) Chapter 343.

The Office of Planning (OP) has reviewed the summary of the proposal and has the following comments to offer.

1. OP provides technical assistance to state and county agencies in administering the statewide planning system in HRS Chapter 226, the Hawaii State Plan. The Hawaii State Plan presents the goals, objectives, priorities, and priority guidelines for growth, development, and the allocation of resources through the State. The Hawaii State Plan includes diverse policies and objectives of state interest including but not limited to the economy, agriculture, the visitor industry, federal expenditure, the physical

environment, facility systems, socio-cultural advancement, climate change adaptation, and sustainability.

The subject EA should include an analysis on the Hawaii State Plan, HRS Chapter 226, that addresses how the proposed Master Plan conforms with state and county plans, policies and controls. The analysis should include a discussion on the ability of the proposed Master Plan to meet the objectives and policies, and priority guidelines listed in HRS Chapter 226.

2. The coastal zone management (CZM) area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the United States territorial sea" see HRS § 205A-1 (definition of "coastal zone management area").

   HRS Chapter 205A requires all state and county agencies to enforce the CZM objectives and policies. The assessment on compliance with HRS Chapter 205A is an important component for satisfying the requirements of HRS Chapter 343.

   The subject EA should include an assessment as to how the proposed action conforms to CZM objectives and its supporting policies set forth in HRS § 205A-2. These objectives and policies include: recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection and marine resources.

3. Given that a regional parking garage with a total of 900 stalls will be developed at the parcel, the EA should assess the ingress and egress effects of vehicle traffic, generated from the proposed Master Plan project on public access to the ocean and the adjacent parks. The EA should propose site-specific mitigation measures to ensure that public access to the ocean and the adjacent parks will not be affected by the proposed project.

4. We note that several projects have been proposed within the Kaka'ako Makai Area. The EA should assess cumulative impact which may result from the incremental impact of the subject proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

5. We concur that the EA should include environmental site assessment pertaining to the potential presence of hazardous or toxic materials on the project site. The Hazard Evaluation and Emergency Response Office, State Department of Health should be

consulted for any potential risk of hazardous materials imposed to human health, and to the project area as a result of the proposed ground altering activities, construction, use and operation.

6. The proposed Lot C Master Plan Project is located within the special management area (SMA). Pursuant to HRS § 206E-8.5, all requests for developments within the SMA and shoreline setback variances for developments within a community development district, for which a community development plan has been developed and approved in accordance with HRS § 206E-5, shall be submitted to and reviewed by OP. Please consult with our office and refer to Hawaii Administrative Rules Chapter 15-150 for the requirements of SMA use.

If you have any questions regarding this comment letter, please contact Shichao Li of our CZM Program at (808) 587-2841.

c: Mr. Earl Matsukawa, Wilson Okamoto Corporation
Mr. Luis P. Salaveria, Director
Department of Business, Economic Development and Tourism

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10063-02
September 23, 2015

Mr. Leo Asuncion
Acting Director
Office of Planning
State of Hawai'i
235 South Beretania Street, 6th Floor
Honolulu, Hawai'i 96813

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HDCA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawai'i

Dear Mr. Asuncion:

Thank you for your letter dated June 30, 2015 (Ref. No. P-14800) regarding the subject pre-assessment consultation. We offer the following responses to your comments:

1. The forthcoming Draft EA will include a discussion of the proposed project's relationship to the Hawai'i State Plan, HRS Chapter 226.

2. The forthcoming Draft EA will include a discussion of the proposed project's relationship to the objectives and policies of the Hawaii Coastal Zone Management (CZM) Program as set forth in HRS Chapter 205A.

3. The forthcoming Draft EA will include a Traffic Impact Report (TIR) evaluating the potential impacts of project-related traffic on roadways in the vicinity of the project site. Recommendations, including potential mitigation measures, are offered. However, because traffic accessing the ocean or public parks in the vicinity cannot be distinguished from other traffic occurring at nearby intersections, the TIR cannot assess traffic impacts by specific destination. Nevertheless, the TIR concludes that the addition of project-related traffic, roadways in the vicinity will continue operating at levels of service similar to conditions without the project.

4. The forthcoming Draft EA accounts for past, present, and reasonably foreseeable future development in the vicinity that, with the proposed action, may have cumulative effects. The broader cumulative impacts of developing the Kaka'ako Makai Area, however, were specifically addressed through a series of environmental review documents prepared by the HCDA. The first was the Kaka'ako Makai Area Plan Final Supplemental EIS published in 1990. This was followed by the Makai Area Plan Amendment Final EA published in July 2005. The most recent document to cover both the mauka and makai area is the Draft Supplemental EIS for the Kaka'ako Community Development District Transit-Oriented Development (TOD) Overlay Plan.

WILSON OKAMOTO CORPORATION

5. In conjunction with the preparation of the environmental site assessment, the Hazard Evaluation and Emergency Response Office, State Department of Health will be consulted regarding any potential risk of hazardous materials imposed to human health, and to the project area as a result of any ground altering activities, construction, use and operation associated with the proposed project.

6. We concur that the subject project lies within the Special Management Area (SMA) administered by the Office of Planning. The Draft EA will list the SMA Use permit among the permits and approvals that may be required for this project.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

UNIVERSITY of HAWAI'I®
MĀNOA

Water Resources Research Center

EM

RECEIVED
JUL 31 2015
WILSON OKAMOTO CORPORATION

July 20, 2015

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

Mr. Matsukawa:

This is to acknowledge receipt of your letter for review of an Environmental Assessment.

Unfortunately, the Water Resources Research Center does not have the capacity to review the 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
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Fax: (808) 956-5044
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10063-02
September 23, 2015

Dr. Darren T. Lerner, PhD
Interim Director
Water Resources Research Center
University of Hawai'i
2540 Dole Street, Holmes Hall 283
Honolulu, Hawai'i 96822

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Dr. Lerner:

Thank you for your letter dated July 20, 2015 regarding the subject pre-assessment consultation. We acknowledge that Water Resources Research Center is unable to review EA due to the faculty position vacancy, and we will not be consulting you, henceforth, in the EA process for this project.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Should you be interested, notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

Hawaiian Telcom

July 9, 2015

EM

RECEIVED JUL 14 2015 WILSON OKAMOTO CORPORATION

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

Dear Mr. Matsukawa:

Subject: **Environmental Assessment (EA) Pre-Assessment Consultation**
Hawaii Community Development Authority
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052
Honolulu, Oahu, Hawaii

Thank you for the opportunity to review and comment on the environmental assessment pre-assessment consultation phase for the subject project.

In response to your letters dated June 17, 2015 that were addressed to Gerald Noda and Winslow I. Tanabe, Hawaiian Telcom does not have any comments to offer at this time.

Please submit future correspondence to:

Jon Uyehara
Senior Manager – OSP Engineering
Network Engineering & Planning
P.O. Box 2200
Mail Code: HIA10
Honolulu, HI 96841

If you have any questions or require assistance in the future on this project, please call me at 546-7761.

Sincerely,

Les Loo
Network Engineer – OSP Engineering
Network Engineering & Planning

cc: File [Alakea]

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10063-02
September 23, 2015

Mr. Jon Uyehara
Senior Manager – OSP Engineering
Hawaiian Telcom, Network Engineering & Planning
P.O. Box 2200
Mail Code: HIA10
Honolulu, Hawai‘i 96826

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai‘i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O‘ahu, Hawaii

Dear Mr. Uyehara:

Thank you for your letter dated July 9, 2015 regarding the subject pre-assessment consultation.

We acknowledge that Hawaiian Telcom does not have any comments to offer on this project at this time. Hereafter, correspondence pertaining to EA for which Hawaiian Telcom is consulted will be directed to you, until we are apprised otherwise.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

From: Kuwaye, Kristen [mailto:kristen.kuwaye@hawaiianelectric.com]
Sent: Monday, July 13, 2015 1:47 PM
To: Wilson Okamoto Corporation
Cc: Liu, Rouen; 1.11.160052@ecollab.heco.com
Subject: Hawaii Community Development Authority

Kristen Kuwaye on behalf of Rouen Liu

Dear Mr. Earl Matsukawa,

Thank you for the opportunity to comment on the subject project. Hawaiian Electric Company has no objection to the project. Should HECO have existing easements and facilities on the subject property, we will need continued access for maintenance of our facilities.

We appreciate your efforts to keep us apprised of the subject project in the planning process. As the proposed Hawaii Community Development Authority Project comes to fruition, please continue to keep us informed. Further along in the design, we will be better able to evaluate the effects on our system facilities.
If you have any questions, please call me at 543-7245.

Sincerely,
Rouen Q. W. Liu
Permits Engineer
Tel: (808) 543-7245
Email: Rouen.liu@hawaiianelectric.com

WILSON OKAMOTO
CORPORATION

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10063-02
September 23, 2015

Mr. Rouen Q. W. Liu
Permits Engineer
Hawaiian Electric Company
Rouen.liu@hawaiianelectric.com

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Hawai'i Community Development Authority (HCDA)
Innovation Block at Lot C Master Plan
Tax Map Key (TMK): [1] 2-1-015:052, Honolulu, O'ahu, Hawaii

Dear Mr. Liu:

Thank you for your e-mail transmittal dated July 13, 2015 regarding the subject pre-assessment consultation. We acknowledge that Hawaiian Electric Company (HECO) has no objection to the proposed project. Per your request, the HCDA will ascertain if there are any HECO easements that must be considered in the design of the proposed project. As appropriate, HECO will continue to be consulted as the project progresses.

Your email, along with this response, will be reproduced and included in the forthcoming Draft EA. Notice that the Draft EA is available for downloading, review and comment will be published in the Office of Environmental Quality Control's (OEQC) Environmental Notice, which is updated on the 8th and 23rd of each month. Please use the following link to view the current issue of the Notice:

(http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Notice/current_issue.pdf)

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

Sincerely,

Earl Matsukawa, AICP
Project Manager

cc: Mr. Deepak Neupane, HCDA
Mr. Troy Miyasato, Ferraro Choi

Innovation Block at Lot "C" Master Plan
Draft Environmental Assessment

Wilson Okamoto Corporation

Engineers & Planners
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826