NEW ALOHA STADIUM
ENTERTAINMENT DISTRICT

PROGRAMMATIC DRAFT
ENVIRONMENTAL IMPACT STATEMENT

DECEMBER 2020

PREPARED FOR:
STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES

WILSON OKAMOTO CORPORATION | CRAWFORD ARCHITECTS
Appendix B:
Geotechnical Engineering Exploration
Survey
PRELIMINARY GEOTECHNICAL ENGINEERING EXPLORATION
ALOHA STADIUM
PLANNING FOR NEW STADIUM & SITE REDEVELOPMENT
HALAWA, OAHU, HAWAII
W.O. 7963-00   APRIL 10, 2020

Prepared for:
Crawford Architects LLC
1801 McGee Street, Suite 200
Kansas City, MO 64108

GEOLABS, INC.
Dear Mr. Jones:

Geolabs, Inc. is pleased to submit our report entitled “Preliminary Geotechnical Engineering Exploration, Aloha Stadium, Planning for New Stadium & Site Redevelopment, Halawa, Oahu, Hawaii,” prepared in support of the master planning and EIS preparation of the new stadium and site redevelopment project.

Our work was performed in general accordance with the scope of services outlined in our revised fee proposal, dated July 1, 2018, and the Consulting Services Agreement for Aloha Stadium entered into on July 16, 2019.

Please note that the soil and rock samples recovered during our field exploration (remaining after testing) will be stored for a period of two months from the date of this report. The samples will be discarded after that date unless arrangements are made for a longer sample storage period. Please contact our office for alternative sample storage requirements, if appropriate.

Detailed discussion and preliminary design recommendations are contained in the body of the report. If there is any point that is not clear, please contact our office.

Very truly yours,

GEOLABS, INC.

Terry S.T. Kwok, P.E.
Vice President

April 10, 2020
W.O. 7963-00

SUMMARY OF FINDINGS AND RECOMMENDATIONS.............................................. iii
1. GENERAL............................................................................................................ 1
   1.1 Project Considerations............................................................................... 1
   1.2 Purpose and Scope..................................................................................... 2
2. SITE CHARACTERIZATION................................................................................ 5
   2.1 Regional Geology..................................................................................... 5
   2.2 Site Description....................................................................................... 7
   2.3 Subsurface Conditions........................................................................... 8
   2.3.1 Recent Fill (Rf).................................................................................. 9
   2.3.2 Recent Alluvium (Ra)......................................................................... 9
   2.3.3 Quaternary Honolulu Tuffs (Qht).................................................... 10
   2.3.4 Older Alluvium (Qa).......................................................................... 10
   2.3.5 Tertiary Koolau Basalt (Tkb).............................................................. 11
   2.4 Seismic Design Considerations............................................................. 13
   2.4.1 Earthquakes and Seismicity............................................................... 14
   2.4.2 Soil Profile Type for Seismic Design.................................................. 15
   2.4.3 Liquefaction Potential...................................................................... 16
3. DISCUSSION AND RECOMMENDATIONS..................................................... 18
   3.1 Deep Foundation System Evaluation...................................................... 19
   3.1.1 Driven Pre-Cast Concrete Piles....................................................... 20
   3.1.2 Drilled Displacement Piles............................................................... 20
   3.1.3 Augered Cast-In-Place (ACIP) Piles............................................... 20
   3.1.4 Cast-In-Place Drilled Shafts............................................................ 21
   3.2 Shallow Foundations............................................................................ 21
   3.3 Slabs-On-Grade................................................................................... 23
   3.4 Retaining Structures............................................................................ 26
   3.4.1 Wall Foundations............................................................................ 26
   3.4.2 Lateral Earth Pressures.................................................................... 27
   3.4.3 Drainage.......................................................................................... 28
   3.5 Ground Settlements............................................................................... 28
   3.6 Site Grading.......................................................................................... 30
   3.6.1 Site Preparation............................................................................... 30
   3.6.2 Fills and Backfills............................................................................. 32
   3.6.3 Fill Placement and Compaction Requirements.............................. 33

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PRELIMINARY GEOTECHNICAL ENGINEERING EXPLORATION
ALOHA STADIUM
PLANNING FOR NEW STADIUM & SITE REDEVELOPMENT
HALAWA, OAHU, HAWAII
W.O. 7963-00   APRIL 10, 2020

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Based on our preliminary field exploration results, available boring data, and geologic information, the subsurface conditions across the stadium premises are highly variable, trending from stiff/dense competent materials at the northern portion of the site to soft and compressible deposits at the southern portion of the project site. Based on the existing site topography, relatively shallow groundwater conditions may be anticipated towards the southern end of the stadium premises.

Based on the anticipated subsurface conditions, we believe that new structures with relatively high structural loads located towards the southern portion of the site underlain by the soft and compressible deposits will likely require a deep foundation support system because the near-surface soils would not provide adequate foundation support for the proposed structures without undergoing appreciable settlements when subjected to the heavy building loads. Based on our preliminary evaluation, we believe that concrete cast-in-place drilled shaft foundations may be a viable alternative for the foundation support of the heavily-loaded structures located in this area. Additional field exploration will be required to formulate detailed foundation recommendations when the type, location, and structural loads of these structures are better defined during the design phase of the project development.

We envision that new structures, located on competent ground towards the northern portion of the project site, may be supported on shallow footing foundations bearing on the competent near-surface soils or new compacted fills placed to achieve the design finished grades. For lightly-loaded structures located towards the southern portion of the site, over-excavation of the shallow footing foundation subgrade soils and replacement with compacted structural fill materials may be required in those areas underlain by the soft and compressible recent alluvium at shallow depths.

As mentioned above, the southern portion of the project site is generally underlain by compressible deposits in the shallow subsurface. Therefore, some settlement of the new fill materials imposed on the underlying soft native soils should be expected if substantial new fills are planned. In order to reduce the effects of the potential ground settlements from the new fill loads, we recommend that the new fills be placed as soon as practical to allow the anticipated ground settlements to occur prior to construction of on-grade improvements on top. Depending on the amount and location of the new fills planned for the project, a fill settlement waiting period and settlement monitoring program may need to be implemented (in areas with substantial fills over soft soils) during the site grading work.
This report presents the results of our preliminary geotechnical engineering exploration and engineering analyses performed in support of the Aloha Stadium – Planning for New Stadium & Site Redevelopment project in Halawa on the Island of Oahu, Hawaii. The project location and general vicinity are shown on the Project Location Map, Plate 1.

This report summarizes the findings and presents our preliminary geotechnical recommendations based on our literature review, field exploration, laboratory testing, and engineering analyses. The preliminary recommendations presented herein are intended for the master planning and preliminary design of new structures and site elements for the new stadium and site redevelopment project only. In addition, discussions on the excavation and dewatering are included in this report for information purposes. The findings and preliminary recommendations presented herein are subject to the additional field exploration and limitations noted at the end of this report.

1.1 Project Considerations

The proposed Aloha Stadium – Planning for New Stadium & Site Redevelopment project is located at the existing Aloha Stadium premises in the Halawa area of Honolulu on the Island of Oahu, Hawaii. The project site is approximately bounded by the Interstate Route H-1 Freeway to the east, Moanalua Freeway to the north, Kamehameha Highway and Pearl Harbor to the west, and Salt Lake Boulevard to the south, as shown on the Site Plan, Plate 2.

The existing Aloha Stadium is an outdoor stadium, which opened in 1975 with a seating capacity of up to 50,000. The stadium was constructed with weathering steel to create a protective patina that would eliminate the need for painting; however, with the ocean salt-laden air of Honolulu, it has never stopped rusting and needs to be replaced. Therefore, it is desired to develop a master plan for the redevelopment of the Aloha Stadium site. Based on the information provided, the mix of uses will include, but not limited to, multi-level offices, residential and hotel buildings, surface parking and structures, retail and public use facilities.
Based on the anticipated scope of work for the master plan development project, we envision preliminary geotechnical recommendations and input would be required for the following areas:

1. Discussions on the generalized subsurface soil/rock and groundwater conditions across the development site.
2. Evaluation of foundation support systems across the development site, which could involve shallow foundations toward the northern portion and deep foundations toward the southern portion of the site.
3. Provision of preliminary retaining structure design recommendations, especially basement walls and other grade separation retaining structures.
4. Provision of preliminary floor slab-on-grade design recommendations, especially towards the southern portion of the site that could be underlain by soft compressible recent alluvial deposits.
5. Provision of preliminary seismic design considerations for the new structures.
6. Provision of preliminary earthwork recommendations for the project, with potential ground settlement in particular due to the anticipated soft soil deposits toward the southern portion of the site.
7. Provision of preliminary pavement design recommendations.
8. Discussions on excavation and shoring requirements for below-grade structures.
9. Discussions on dewatering requirements for excavations extending below the groundwater level.

Based on our experience in the surrounding area and the available geologic information, it appears that the project site is likely underlain by variable subsurface materials consisting of older alluvium towards the northern portion of the property and recent alluvium towards the southern side. It should be noted that the thicknesses and consistencies of the different geologic materials could vary significantly across the project site.

1.2 Purpose and Scope

Due to the variable subsurface soil conditions across the stadium site as described above, it is desired to conduct a preliminary field exploration to gain an understanding of the subsurface soil/rock and groundwater profiles across the project site. The subsurface information obtained would be used to develop a soil and/or rock data set to formulate preliminary geotechnical recommendations in support of the master planning and Environmental Impact Statement (EIS) preparation for the proposed new stadium and site redevelopment project. The scope of work for this preliminary exploration included the following tasks and work efforts:

1. Research and review of the available in-house boring data and other available subsurface information, construction plans and documents, at and around the project site. A list of the references used in the preparation of this report is presented in the References section.
2. Reconnaissance of the project site to observe the existing overall site conditions and evaluate the accessibility of the proposed boring locations by our engineers.
3. Coordination of our field exploration work with the Aloha Stadium’s administrative and maintenance personnel.
4. Staking out of boring locations and coordination of underground utility line clearance by our geologist.
5. Mobilization and demobilization of a truck-mounted drill rig, water truck, and operators to and from the project site.
6. Drilling and sampling of six borings extending to depths ranging from about 51.5 to 152.5 feet below the existing ground surface for a total of approximately 590 linear feet of exploration.
7. Coordination of the field exploration and logging of the borings by our geologists.
8. Restoration of the drilled boreholes at the top by patching with 6 inches of concrete mix at the completion of our drilling and sampling work. A black pigment dye was used to match the asphalt color for those borings with AC paving at the ground surface.
9. Laboratory testing of selected soil and rock samples obtained during the field exploration as an aid in classifying the materials and evaluating their engineering properties.
10. Analyses of the field and laboratory data to formulate preliminary geotechnical recommendations in support of the master planning and preparation of the EIS document for the new stadium and site redevelopment project.
11. Preparation of this report summarizing our work and presenting our findings and preliminary geotechnical engineering recommendations.

12. Coordination of our overall work on the project by our engineers.

13. Quality assurance and client-design team consultation by our principal engineer.

14. Miscellaneous work efforts, such as drafting, word processing, and clerical support.

Detailed descriptions of our field exploration methodology and the Logs of Borings are presented in Appendix A. Laboratory test results performed on selected soil and rock core samples obtained from our field exploration are presented in Appendix B. Photographs of the core samples retrieved from the field exploration are presented in Appendix C.

END OF GENERAL

SECTION 2. SITE CHARACTERIZATION

2.1 Regional Geology

The Island of Oahu was built by the extrusion of basaltic lava from the Waianae and Koolau Shield Volcanoes. The older Waianae Volcano is estimated to be middle to late Pliocene in age, and the Koolau Volcano is estimated to be late Pliocene to early Pleistocene in age. As volcanic activity at Waianae Volcano ceased, lava flows from Koolau Volcano banked against its eroded eastern slope forming the Schofield Plateau.

The Koolau Volcanic Shield was built during the late Pliocene Epoch and early Pleistocene Epoch by the extrusion of successive thin bedded lava flows. The main shield-building stage ceased approximately 2.5 million years ago. Evidence from historic drilled wells indicates that the Island of Oahu has subsided by as much as 1,200 feet since the cessation of the early volcanic activity (Macdonald and Abbott, 1970). During the period of island subsidence, coral-algal reefs began to grow along the southern coast of Oahu forming embayments protected by barrier reefs. A series of lagoons formed behind the barrier reefs and both terrigenous and marine sediments accumulated in the lagoons (Macdonald and Abbott, 1970).

During the Pleistocene Epoch (Ice Age), many sea level changes occurred as a result of widespread glaciation in the continental areas of the world. As the great continental glaciers accumulated, the level of the oceans fell because there was less water available to fill the oceanic basins. Conversely, as the glaciers receded (melted), global sea levels rose because the volume of water increased. The land mass comprising the Island of Oahu remained essentially stable during these water level changes, and the fluctuations were eustatic in nature. These glacio-eustatic fluctuations resulted in stands of the sea that were both higher and lower relative to present sea level on the Island of Oahu.

The higher sea level stands caused landform changes including the accumulation of deltas and alluvial fans composed of terrigenous sediments in the heads of the old bays, the accumulation of reef deposits at correspondingly higher elevations, and the accumulation of lagoonal and/or marine sediments in the quiet lagoonal waters protected
by barrier reefs. The concurrent growth of reefs and the accumulation of lagoonal sediments also resulted in the deposition of coral-algal limestone and marl materials within the predominantly lagoonal sedimentary unit.

The lower sea level stands caused streams to carve drainages into the coastal plain platforms composed of sedimentary and coral reef deposits. In addition, subaerial exposure of the calcareous sediments caused consolidation of the soft deltaic materials and lagoonal deposits and the induration of calcareous reef materials. Furthermore, renewed subaerial erosion acting at the upper elevations of the volcanic shield caused the downstream deposition of terrigenous alluvial sediments under relatively higher energy conditions.

During periods of no significant sea level changes, continued meandering stream action extended the alluvial deltas and fans seaward and deposited alluvial materials overlying the marine-lagoonal sediments. The geologic history of the Aloha Stadium area was further complicated by the deposition of recent age pyroclastic materials via explosive eruptions from cone vents in the Salt Lake area, as described in the following paragraphs.

As discussed above, the majority of the Island of Oahu was formed during the main volcanic shield building stage, which eventually experienced a hiatus. After a long period of volcanic inactivity, during which time erosion incised deep valleys into the Koolau Shield Volcano along with the accumulation of the terrigenous and lagoonal deposits along the coastal areas, volcanic activity returned to portions of the Island of Oahu as a series of localized lava flows followed by explosive cinder and tuff cone formations. These late eruptions belong to the Honolulu Volcanic Series and are believed to have occurred between about 30,000 and 800,000 years ago.

The scattered eruptions emanated from about 37 vents distributed mainly over the south and east sides of the older Koolau Shield Volcano (Gramlich, Lewis, & Naughton, 1971). Multiple cinder and tuff cone vents belonging to the Honolulu Volcanic Series erupted easterly of the Pearl Harbor East Loch in the Salt Lake area. The more prominent Salt Lake area volcanic vents still retain some visible remnant crater structure as represented by the subaerial topography of the Aliamanu and Makalapa Craters. These post-erosional (i.e. following the cessation of shield building) events were contemporaneous with some of the late Pleistocene sea level fluctuations.

These late eruptions were explosive in character due to the rising magma’s interaction with groundwater that resulted in violent steam explosions that expelled large quantities of pyroclastic materials generally composed of volcanic ash and cinder with some embedded blocks of basaltic rock. These deposits consolidated to form volcanic tuff, locally referred to as “mudrock”.

The oldest of the eruptions (at Aliamanu Crater) caused the initial large diversion of Halawa Stream to the north of its original location into what are now the Southeast and Magazine Lochs of Pearl Harbor during the Kaena (+95 feet) high stand of the sea. The Aliamanu tuff is a water-laid pyroclastic deposit resulting from the higher stand of the sea at the time of deposition.

Following the deposition of the Aliamanu tuff, stream erosion and the deposition of alluvial soils continued prior to the next phase of pyroclastic eruptions at Salt Lake. The later Salt Lake area eruptions were essentially simultaneous and have been assigned to the stand of the sea that was between about 40 to 60 feet below the present sea level. The last Salt Lake area pyroclastic eruptions deposited a mantle of volcanic tuff over much of the Makalapa-Salt Lake area.

In summary, the Aloha Stadium site is located on the Southern Oahu Coastal Plain and north of Makalapa Crater and northwest of Aliamanu and Salt Lake tuff cones. In general, the subsurface materials underlying the Aloha Stadium site consist of alluvial soils and volcanic tuff overlain by recent fills.

2.2 Site Description

The proposed Aloha Stadium – Planning for New Stadium & Site Redevelopment project is located at the existing Aloha Stadium premises in the Halawa area of Honolulu on the Island of Oahu, Hawaii. The project site is approximately bounded by the Interstate Route H-1 Freeway to the east, Moanalua Freeway to the north, Kamehameha Highway and Pearl Harbor to the west, and Salt Lake Boulevard to the south.
Based on our field observations, the northern side of the project site is generally occupied by the existing oval-shaped stadium surrounded by concentric rings of on-grade parking lined with Monkey Pod trees. The southwestern corner of the project site is fenced off for the on-going construction of the Aloha Stadium Station facility for the Honolulu Rail Transit Project (HRTP). The remaining areas generally consist of open on-grade parking with asphalt paving. The southeastern portion of the site is traversed by the Halawa Stream with three single-span bridges providing vehicular and pedestrian access across the stream channel.

Based on our field observations and the Google Earth map, the terrain at the project site is gently sloping with existing ground elevations ranging from about +65 feet Mean Sea Level (MSL) at the north to about +5 feet MSL at the south.

2.3 Subsurface Conditions

In general, we observed five main stratigraphic units within the premises of the Aloha Stadium redevelopment project. The stratigraphic units consist of soil and rock materials of varying character and engineering properties. The five main stratigraphic units are listed below in the general order of geologic age, beginning with the youngest unit and ending with the oldest unit with older alluvium also being encountered above the volcanic tuff formation:

1. Recent Fill (RF)
2. Recent Alluvium (Ra)
3. Quaternary Honolulu Tuffs (Qht)
4. Older Alluvium (Qa)
5. Tertiary Koolau Basalt (Tk)

The following subsections briefly describe the general characteristics of each of the above stratigraphic units based on our literature research, experience with similar materials, and the field exploration and laboratory testing program conducted at selected locations at the project site. The approximate delineation of these stratigraphic units at the ground surface at and around the stadium site is presented on the Geology Map, Plate 3.

2.3.1 Recent Fill (RF)

This stratigraphic unit represents areas that were filled during urbanization. The fill materials are generally underlain by stiff older alluvium at the northern portion of the site and by soft recent alluvium towards the southern portion of the site. The quality and composition of the fill materials are variable. Some of these fills might have been placed without proper compaction control.

2.3.2 Recent Alluvium (Ra)

These soils generally are the result of sedimentation in a very low energy environment such as an estuary or bay. Frequently, the soils assigned to this unit accumulated very rapidly underwater and might not have been exposed to air. Therefore, there is a tendency to encounter under-consolidated [OCR (Over Consolidation Ratio) < 1.0] sediments, which settle under the weight of minimal overburden or structural loading. Recent alluvium generally is found within some stream channels and bordering some stream banks, at the mouths (outlets) of streams, and within broad valley floors and basin features surrounded by hills. These soils also may be found in proximity to the swamp and tidal flat environments. The soils assigned to this unit generally are considered poorly to very poorly suited for use as support for foundation loads, due to their low in-situ strength characteristics and the tendency for excessive settlement to occur in structures overlying soils of this unit. The following subunits are used in this report.

Recent Alluvium
This subunit generally consists of tan to brown silty clays with varying amounts of sands and infrequent pockets of gravel and cobbles. The consistency is generally in the range of very soft to medium stiff.

Lagoonal Deposit
This subunit generally consists of light gray to medium gray sandy silts or silty sands in a very soft to soft consistency and/or very loose to loose relative density. Gravel-sized fragments are rare. Frequently, the silts are organic in origin and may have a mild to strong organic odor.
2.3.3 Quaternary Honolulu Tuffs (Oqt)
Tuff from vents of the Honolulu Volcanic Series consists of volcanic ash, which consolidated or hardened to form a medium hard rock that resembles siltstone or sandstone, locally called ‘mudrock’. The tuff is frequently found overlying coralline deposits or older alluvium units.

Because the formation is a medium hard rock, it has high strength characteristics. Structurally, the tuff is very competent. This formation has relatively low permeability, and groundwater generally is not encountered in this formation. When it does occur, it is usually in the form of seepage along joints.

2.3.4 Older Alluvium (Qa)
Older alluvial deposits are generally very stiff to hard silty and clayey soils and medium dense to very dense silty/clayey sands and gravels that originally were deposited in alluvial environments, buried over long periods of time by more recent deposits to become somewhat consolidated, and then subsequently unconsolidated at the ground surface by erosion or other geologic processes. This unit generally overlies the Koolau Basalt and consists of terrigenous sediments, which have been transported by stream action from the upper reaches of the streams.

Gravel lenses representing buried stream channels sometimes are encountered. Portions of the Older Alluvium unit contain some weathered basaltic cobbles and boulders. These coarse-grained parts of the unit also may contain artesian groundwater from the basalt freshwater system or as a sub-aquifer. The deposits may resemble saprolite soil deposits, but they are clearly differentiable by the layered characteristics. Frequently, these materials show a moderate to high shrink/swell potential when subjected to fluctuations in moisture. The following subunits are used in this report.

Older Alluvium
This subunit generally consists of tan to brown silty clays with varying amounts of sands and infrequent pockets of gravel and cobbles. The consistency is generally in the range of very stiff to hard.

Old Lagoonal Deposit
This subunit generally consists of light gray to medium gray sandy silts or silty sands in stiff to very stiff consistency and/or medium dense to dense relative density with various degrees of cementation. In some cases, strongly cemented deposits form siltstones. Gravel-sized fragments are rare. Frequently, the silts are organic in origin and may have a mild to strong organic odor.

2.3.5 Tertiary Koolau Basalt (Tkb)
Koolau Basalt is the oldest geologic unit within the section alignment extending from Aiea to Middle Street. Generally, it consists of a’a and pahoehoe flows of basaltic lavas and may have a mantle of cobbles and boulders, or residual soils, overlying the top of the basalt formation. In addition, it is anticipated that various types of volcanic rock sub-components, such as clinker layers and lava tubers, also may be encountered within the basalt formation. The following subunits are used in this preliminary geotechnical report.

Residual Soil
This subunit consists of soils produced from the in-situ chemical weathering of the basic rock originating from Koolau Basalt. These soils generally consist of stiff to very stiff, brownish red or reddish brown clayey silts and silty clays. The soils are usually “structureless” and may have a blocky texture.
SECTION 2. SITE CHARACTERIZATION

Saprolite
Saprolite essentially is derived from the tropical weathering of volcanic formations, which may contain intrusive rock bodies of variable composition, such as basalt, andesite, etc. Saprolite is a form of residual soil that exhibits a relict structure from the parent rock. Structural features, such as vesicles and joints, are visible in saprolite. This subunit consists of predominantly clayey silt and silty clay soils containing variations in color with varying degrees of mottling.

Clinker
Clinker is the fragmental basalt found on the top, and sometimes at the bottom, of a’a lava flows. Clinker generally is gravel to cobble-sized fragments of scoriaceous rock in a tightly packed but open-graded structure.

Basalt Formation
This subunit is used to designate the in-situ lava formation. This subunit occurs as red, brown, or gray, severely fractured to massive, medium hard to very hard rock formation.

Our preliminary field exploration program consisted of drilling and sampling six borings, designated as Boring Nos. 1 through 6, extending to depths of about 51.5 to 152.5 feet below the existing ground surface. The approximate boring locations are shown on the Site Plan, Plate 2. Some of the relevant boring locations from previous field explorations conducted at the project site through our literature research also are shown on the same plan for reference purposes.

Based on our field exploration results, the available boring data and geologic information, the northern portion of the project site appears to be underlain by surface fills placed over older alluvial deposits. The older alluvium generally consisted of very stiff to hard silty clays and clayey silts extending to depths ranging between about 30 and 90 feet below the existing ground surface. The older alluvium was generally underlain or interbedded with medium hard to very hard volcanic tuff formation between depths of about 35 and 60 feet below the existing ground surface.

Towards the southern portion of the site, the existing ground is underlain by surface fills placed over a relatively thick layer of compressible deposits, consisting of soft to very soft clayey silts with organic matter, extending to depths ranging from about 50 to 100 feet below the existing ground surface. Older alluvial deposits and saprolites consisting of stiff to very stiff clayey soils underlain by medium hard to very hard basalt rock formation were then encountered and extended to the maximum depth explored of about 152.5 feet below the existing ground surface.

For illustration purposes only, two Generalized Geologic Cross-Sections depicting the interpreted subsurface conditions at the project site are provided on Plates 4.1 and 4.2. The approximate surface projections of the subsurface profiles prepared for this report are shown on the Site Plan, Plate 2.

We encountered groundwater in the drilled borings at depths of about 12.6 (southern portion of the site) to 46.4 feet (northern portion of the site) below the existing ground surface at the time of our field exploration. It should be noted that groundwater levels can fluctuate depending on surface water runoff and seasonal precipitation, groundwater withdrawal and/or injection, and other factors.

Detailed descriptions of the field exploration methodology and graphic representations of the materials encountered in the borings are presented on the Logs of Borings in Appendix A. We performed laboratory tests on selected soil and rock core samples obtained during our field exploration, and the test results are presented in Appendix B. Photographs of the core samples obtained from the boring locations are presented in Appendix C.

2.4 Seismic Design Considerations
Based on the International Building Code, 2012 Edition (IBC 2012), the project site may be subjected to seismic activity, and seismic design considerations will need to be addressed for the project. The following sections provide discussions on the seismicity of the Island of Oahu and the soil profile for seismic design.
2.4.1 Earthquakes and Seismicity

In general, earthquakes throughout the world are caused by shifts in the tectonic plates. In contrast, earthquake activity in Hawaii is linked primarily to volcanic activity; therefore, earthquake activity in Hawaii generally occurs before or during volcanic eruptions. In addition, earthquakes may result from the underground movement of magma that comes close to the surface but does not erupt. The Island of Hawaii experiences thousands of earthquakes each year, but most are so small that they can only be detected by sensitive instruments. However, some of the earthquakes are strong enough to be felt, and a few cause minor to moderate damage.

In general, earthquakes associated with volcanic activity are most common on the Island of Hawaii. Earthquakes that are directly associated with the movement of magma are concentrated beneath the active Kilauea and Mauna Loa Volcanoes on the Island of Hawaii. Because the majority of earthquakes in Hawaii (over 90 percent) are related to volcanic activity, the risk of seismic activity and degree of ground shaking diminishes with increased distance from the Island of Hawaii. The Island of Hawaii has experienced numerous earthquakes greater than Magnitude 5 (M5+); however, earthquakes are not confined only to the Island of Hawaii. To a lesser degree, the Island of Maui has experienced several earthquakes greater than Magnitude 5. Therefore, moderate to strong earthquakes have occurred in the County of Maui.

The effects of earthquakes occurring on the Islands of Hawaii and Maui may be felt on the Island of Oahu. For example, small landslides occurred on the Island of Oahu as a result of the Maui Earthquake of 1938 (M6.8). Some houses on the Island of Oahu were reportedly damaged as a result of the Lanai Earthquake of 1871 (M7+). In the last 150 years of recorded history, we are not aware of earthquakes greater than Magnitude 6 that have occurred on the Island of Oahu. An earthquake of Magnitude 4.8 to 5.0 occurred along the Diamond Head Fault in 1948 on the Island of Oahu. The moderate tremor resulted in broken store windows, ruptured building walls, and broken underground water mains.

2.4.2 Soil Profile Type for Seismic Design

Based on our field exploration results, the available boring data and geologic information, the project site is likely underlain by variable subsurface materials ranging from medium hard to very hard volcanic tuff and basaltic rock formation, stiff to hard older alluvium, to soft recent alluvium trending from competent materials at the northern portion of the site to highly compressible deposits towards the southern portion of the project site.

Based on the anticipated subsurface materials as described above, the project site could be classified from a seismic analysis standpoint, depending on the location of the new structures, as either a “Very Dense Soil and Soft Rock” site corresponding to a Site Class C, or a “Stiff Soil” site corresponding to a Site Class D, or a “Soft Clay Soil” site corresponding to a Site Class E soil profile type based on the ASCE Standard ASCE/SEI 7-10 (Table No. 20.3-1), referenced by the International Building Code, 2012 Edition. Based on these site classes, the following seismic design parameters were estimated and may be used for seismic analysis of the project.

<table>
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<tr>
<th>SEISMIC DESIGN PARAMETERS – SITE CLASS C</th>
<th>Value</th>
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</tbody>
</table>
SECTION 2. SITE CHARACTERIZATION

SEISMIC DESIGN PARAMETERS – SITE CLASS D

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>MCE Peak Bedrock Acceleration, PBA (Site Class B)</td>
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</tr>
<tr>
<td>Spectral Response Acceleration (Site Class B), $S_0$</td>
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</tr>
<tr>
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SEISMIC DESIGN PARAMETERS – SITE CLASS E

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<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>MCE Peak Bedrock Acceleration, PBA (Site Class B)</td>
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</tr>
<tr>
<td>Spectral Response Acceleration (Site Class B), $S_0$</td>
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</tr>
<tr>
<td>Spectral Response Acceleration (Site Class B), $S_1$</td>
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<tr>
<td>Site Class</td>
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<td>Design Spectral Response Acceleration, $S_{d1}$</td>
<td>0.362</td>
</tr>
</tbody>
</table>

2.4.3 Liquefaction Potential
Based on the International Building Code (2012 Edition), the project site should be evaluated for the potential for soil liquefaction. The effects of potential liquefaction may be taken into consideration in the design of the proposed redevelopment.

Soil liquefaction is a condition where saturated cohesionless soils located near the ground surface undergo a substantial loss of strength due to the build-up of excess pore water pressures resulting from cyclic stress applications induced by earthquakes. In this process, when the loose saturated sand deposit is subjected to vibration (such as during an earthquake), the soil tends to densify and decrease in volume causing an increase in pore water pressure. If drainage is unable to occur rapidly enough to dissipate the build-up of pore water pressure, the effective stress (internal strength) of the soil is reduced. Under sustained vibrations, the pore water pressure build-up could equal the overburden pressure, essentially reducing the soil shear strength to zero and causing it to behave as a viscous fluid. During liquefaction, the soil acquires sufficient mobility to permit both horizontal and vertical movements, and if not confined, will result in significant deformations.

Soils most susceptible to liquefaction are loose, uniformly graded, fine-grained sands and loose silts with little cohesion. The major factors affecting the liquefaction characteristics of a soil deposit are as follows:

<table>
<thead>
<tr>
<th>FACTORS</th>
<th>LIQUEFACTION SUSCEPTIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Size Distribution</td>
<td>Fine and uniform sands and silts are more susceptible to liquefaction than coarse or well-graded sands.</td>
</tr>
<tr>
<td>Initial Relative Density</td>
<td>Loose sands and silts are most susceptible to liquefaction. Liquefaction potential is inversely proportional to relative density.</td>
</tr>
<tr>
<td>Magnitude and Duration of Vibration</td>
<td>Liquefaction potential is directly proportional to the magnitude and duration of the earthquake.</td>
</tr>
</tbody>
</table>

Based on the anticipated subsurface conditions, we believe the phenomenon of soil liquefaction is not a design consideration for this project site. The risk for potential liquefaction is low at this project site based on the anticipated subsurface conditions (medium hard to very hard volcanic tuff and basalt rock formation, stiff to hard alluvial deposits, and soft to very soft clayey soils within the depths of the borings).

END OF SITE CHARACTERIZATION
SECTION 3. DISCUSSION AND RECOMMENDATIONS

Based on our preliminary field exploration results, available boring data and geologic information, the subsurface conditions across the stadium premises are highly variable, trending from stiffidense competent materials at the northern portion of the site to soft and compressible deposits at the southern portion of the project site. Based on the existing site topography, relatively shallow groundwater conditions may be anticipated towards the southern end of the stadium premises.

Based on the anticipated subsurface conditions, we believe that new structures with relatively high structural loads located towards the southern portion of the site underlain by the soft and compressible deposits will likely require a deep foundation support system because the near-surface soils would not provide adequate foundation support for the proposed structures without undergoing appreciable settlements when subjected to the heavy building loads. Based on our preliminary evaluation, we believe that concrete cast-in-place drilled shaft foundations may be a viable alternative for the foundation support of the heavily-loaded structures located in this area. Additional field exploration will be required to formulate detailed foundation recommendations when the type, location, and structural loads of these structures are better defined during the design phase of the project development.

We envision that new structures located on competent ground towards the northern portion of the project site may be supported on shallow footing foundations bearing on the competent near-surface soils or new compacted fills placed to achieve the design finished grades. For lightly-loaded structures located towards the southern portion of the site, over-excavation of the shallow footing foundation subgrade soils and replacement with compacted structural fill materials may be required in those areas underlain by the soft and compressible recent alluvium at shallow depths.

As mentioned above, the southern portion of the project site is generally underlain by compressible deposits in the shallow subsurface. Therefore, some settlement of the new fill materials imposed on the underlying soft native soils should be expected if substantial new fills are planned. In order to reduce the effects of the potential ground settlements from the new fill loads, we recommend that the new fills be placed as soon as practical to allow the anticipated ground settlements to occur prior to construction of on-grade improvements on top. Depending on the amount and location of the new fills planned for the project, a fill settlement waiting period and settlement monitoring program may need to be implemented (in areas with substantial fills over soft soils) during the site grading work.

Detailed discussions and preliminary geotechnical recommendations in support of the master planning and EIS preparation for the proposed new stadium and site redevelopment project are presented in the following sections.

3.1 Deep Foundation System Evaluation

We understand the mix of uses for the master plan development will include, but not limited to: a stadium, multi-level offices, residential and hotel buildings, parking structures, retail and public use facilities. Detailed information on the new structures were not available at this phase of the project. However, we envision some of the new structures, such as the stadium and high-rise buildings, would likely have relatively high structural loads, possibly on the order of about 2,000 to 3,000 kips per column for dead-plus-live loads.

As mentioned above, the project site is underlain by variable subsurface materials ranging from very hard volcanic tuff formation to very soft lagoonal deposits at relatively shallow depths. Therefore, new structures with relatively high structural loads located towards the southern portion of the site underlain by the highly compressible deposits will likely require a deep foundation support system because the near-surface soils would not provide adequate foundation support for the proposed structures without undergoing appreciable settlements when subjected to the building loads. The following subsections provide general discussions of the various deep foundation systems considered for the project. Additional field exploration will be required to formulate detailed foundation recommendations when the type, location, and structural loads of the heavily loaded structures in this area are better defined.
3.1.1 Driven Precast Concrete Piles
Driven concrete piles were considered; however, we believe the use of a driven pile foundation may pose some significant design and construction issues for the project development due to the potential presence of relatively thin, hard volcanic tuff and basalt rock ledges anticipated at various depths below the ground surface. The presence of relatively thin volcanic tuff and basalt rock ledges anticipated at various depths across the project site would result in the potential for driven piles to “hang up” on the relatively thin, hard volcanic tuff and basalt rock ledges and the potential need to increase the size of the pile caps substantially to accommodate the additional replacement piles. Therefore, we believe the use of a driven pile foundation alternative may not be cost-effective for the heavily-loaded structures planned towards the southern portion of the project site.

3.1.2 Drilled Displacement Piles
Drilled displacement piles generally consist of advancing a screw-shaped drill head to desired depths. After reaching the desired depth, grout of a specified consistency is pumped into the drilled hole through an orifice located in the drilling bit at the tip of the hollow-stem auger. The specialized drill head displaces the soil laterally during advancement, resulting in a limited amount of drill spoils. The size of the drilled displacement piles generally ranges from about 12 to 30 inches.

Because a significant amount of torque is required to install the drilled displacement piles, the size and depth of the displacement piles are limited by the subsurface conditions at the site. Based on the relatively high structural load demand and the significant depth of the compressible deposits, some of the new foundations likely will need to extend to depths of 100 feet or greater below the ground surface. Due to the presence of volcanic tuff and basalt rock formation, we believe significant constructability issues would arise for the drilled displacement piles extending down to 100 feet or greater below the ground surface.

3.1.3 Augered Cast-In-Place (ACIP) Piles
Augered cast-in-place (ACIP) piles utilize a hollow-stem auger to drill to the desired depths. Therefore, the use of temporary casing and/or drilling fluids is not required.

Augered cast-in-place pile foundation systems would not generate significant noise and vibrations normally associated with the other deep foundation systems, such as driven piles.

Augered cast-in-place pile foundations are highly effective in a wide range of soil conditions; however, the auger may not be able to penetrate through the hard volcanic tuff and/or basalt rock formation anticipated towards the southern portion of the project site. Additional engineering analyses and evaluation would be required to determine if this deep foundation support system is a viable alternative for this development.

3.1.4 Cast-In-Place Drilled Shafts
Drilled shaft foundations are highly effective in soil formations that can stay open after drilling until concrete placement. Unfortunately, the soft clays towards the southern portion of the project site likely will not stay open following drilling. Therefore, partial-depth temporary casing and/or the use of drilling fluids (polymer slurry) likely will be necessary to maintain the integrity of the drilled hole during drilled shaft installation. This would increase the construction complexity and costs for the foundations. In addition, the anticipated groundwater level within the drilled shaft depths at the project site also may pose some construction difficulties because proper observation of the sides and bottoms of the drilled shafts may not be possible.

As with ACIP pile foundations, one of the primary advantages of the drilled shaft foundation systems is that construction would not generate appreciable noise and vibrations normally associated with the other deep foundation systems, such as driven piles. In addition, construction of the drilled shafts will involve generating spoils that will need to be disposed of. In general, we believe that drilled shaft foundations may be a viable alternative for this redevelopment project.

3.2 Shallow Foundations
We envision that new structures, located on competent ground towards the northern portion of the project site, may be supported on shallow footing foundations bearing on the competent near-surface soils and/or new fills placed to achieve the design finished grades. For lightly loaded structures located toward the southern portion of the
site, over-excavation of the shallow footing foundation subgrade soils and replacement with compacted structural fill may be required in those areas where the competent soils are underlain by soft recent alluvium at shallow depths.

For planning and preliminary design purposes, an allowable bearing pressure of up to 3,000 pounds per square foot (psf) may be used to design the shallow foundations bearing on the recompacted on-site soils and/or new compacted fills needed to achieve the finished grades for new structures located on competent ground towards the northern portion of the project site. The allowable bearing pressure may need to be reduced to 2,000 psf for lightly-loaded structures located toward the southern portion of the site. These bearing values are for sizing the footings based on dead-plus-live loads and may be increased by one-third (1/3) for transient loads, such as those caused by wind or seismic forces. It should be noted that over-excavation of the shallow footing foundation subgrade soils and replacement with structural fill may be required in those areas where the surface fills are underlain by the soft and compressible recent alluvium at shallow depths. The need for over-excavation and replacement of the foundation subgrade soils will need to be further evaluated when the structure location and building loads are better defined.

The bottom of footing excavations should be recompacted to at least 90 percent relative compaction to provide a relatively firm and smooth bearing surface prior to placing reinforcing steel and/or concrete. Soft and/or loose materials encountered at the bottom of footing excavations should be over-excavated to expose the underlying firm materials. The over-excavation may be backfilled with the on-site soils compacted to a minimum of 90 percent relative compaction, or the bottom of footing may be extended down to bear directly on the underlying competent materials.

In general, the bottom of footings should be embedded a minimum of 18 to 24 inches below the lowest adjacent finished grades. Footings constructed near tops of slopes or on sloping ground conditions should be embedded deep enough to provide a minimum horizontal setback distance of 6 feet measured from the outside edge of the footings (base of footing) to the face of the slope. Footings adjacent to planned (or existing) retaining walls should be embedded deep enough to avoid surcharging the retaining wall foundations, or the planned retaining walls should be designed to resist the additional structural loads.

Foundations next to utility trenches or easements should be embedded below a 45-degree imaginary plane extending upward from the bottom edge of the utility trench or the footing should be embedded to a depth as deep as the inverts of the utility lines. This requirement is necessary to avoid surcharging adjacent below-grade structures with additional structural loads and to reduce the potential for appreciable foundation settlement.

If structure foundations are designed and constructed strictly in accordance with our recommendations, we estimate total settlements of footings supported on the recompacted on-site soils and/or new compacted fills to be on the order of about 1 to 1.5 inches or less. We estimate that differential settlements between adjacent footings supported on similar materials to be on the order of about 0.5 to 0.75 inches.

Lateral loads acting on the structures may be resisted by friction developed between the bottom of the foundation and the bearing soil and by passive earth pressure acting against the near-vertical faces of the foundation system. A coefficient of friction of 0.3 to 0.35 may be used for footings bearing on the recompacted on-site soils and/or new compacted fills. Resistance due to passive earth pressure may be estimated using an equivalent fluid pressure of 300 to 350 pounds per square foot per foot of depth (pcf). This assumes the soils around the footings are well-compact ed. Unless covered by slabs or pavements, the passive pressure resistance in the upper 12 inches of soil should be neglected. In addition, the passive pressure resistance for foundations on slopes should be reduced.

### 3.3 Slabs-On-Grade

We anticipate the ground floor slabs for the new building construction will consist of reinforced concrete slabs-on-grade. Based on the existing topography and the anticipated finished floor elevation, we envision the slabs-on-grade generally will be supported on the recompacted on-site soils and/or new compacted fills placed to raise the existing ground surface to the finished subgrades.
SECTION 3. DISCUSSION AND RECOMMENDATIONS

New fills needed to raise the project site to the finished subgrades will induce some ground settlements due to consolidation of the underlying compressible lagoonal deposits toward the southern portion of the project site. Therefore, we recommend placing the new fills as soon as practical to allow the anticipated ground settlements to occur prior to slab-on-grade construction. We also recommend lightly reinforcing the building slabs-on-grades, as a minimum, with No. 3 reinforcing bars spaced at 12 inches in each direction in lieu of the standard welded wire fabric. This is to reduce the potential for appreciable structural distress resulting from differential movements of the slabs due to the expansive nature of the on-site soils.

Our field exploration and experience in the area indicate the near-surface clayey soils exhibit moderate shrink/swell characteristics when subjected to fluctuations in the soil moisture contents. Unless slabs-on-grade constructed above these expansive soils are properly designed, there is a potential for future distress to the lightly loaded slabs-on-grade resulting from shrinking and swelling of the clayey soils due to changes in the moisture content. To reduce the potential for appreciable structural distress resulting from swelling of the subgrade soils, we recommend properly preparing the subgrade soils prior to fill placement. In addition, we recommend providing 6 to 12 inches of non-expansive select granular fill materials below the slab cushion to support the concrete slabs-on-grades.

For interior building slabs (not subjected to vehicular traffic or sustained machinery vibration), we recommend placing a minimum 4-inch thick layer of cushion fill consisting of open-graded gravel (ASTM C33, No. 67 gradation) below the slabs. The open-graded gravel cushion fill would provide uniform support of the slabs and would serve as a capillary moisture break. To reduce the potential for appreciable future moisture infiltration through the slab and subsequent damage to floor coverings, an impervious moisture barrier, such as a plastic membrane, is recommended on top of the gravel cushion fill layer. Flexible floor coverings, such as carpet or sheet vinyl, should be considered because they can better mask minor slab cracking. In addition, we recommend designing interior walls to incorporate some flexibility in accommodating a small amount of possible ground movements.

Where the slabs will be subjected to vehicular traffic or sustained machinery vibration, such as trucks and/or forklifts, we recommend providing a 6-inch layer of aggregate subbase below the slabs in lieu of the 4-inch thick gravel cushion fill layer. The moisture barrier also may be omitted for these slabs. The aggregate subbase should consist of crushed basaltic aggregates compacted to a minimum of 95 percent relative compaction.

For the design of structural slabs supported on aggregate subbase, a modulus of subgrade reaction of about 200 pounds per square inch per inch of deflection (pci) may be used for the compacted aggregate subbase. Where slabs are intended to function as rigid pavements for trucks, a minimum slab thickness of 6 inches may be used for preliminary design purposes. Provisions should be made for proper load transfer across the slab joints that will be subject to vehicular traffic. The thickened edges of slabs adjacent to unpaved areas should be embedded at least 12 inches below the lowest adjacent grade.

In order to reduce the potential for appreciable distress due to differential movements between the heavier footings and the lighter building slab, we recommend using free-floating slabs-on-grade with no structural connections to the wall and column foundations. Joint filler and sealant may be used to fill the openings between the edges of the slab and other structural elements. To further reduce the potential for appreciable distress to the building slabs-on-grade and foundations resulting from water infiltration into the subsurface from areas immediately adjacent to the building foundations, we recommend providing a concrete sidewalk (or pavement) around the perimeter of the new building. Construction joints should be provided at intervals equal to the width of the sidewalk with expansion joints at right-angle intersections.

Based on our experience with expansive soils, minor differential slab movements between the building slab and the abutting sidewalk slabs have been observed on several occasions. We believe this situation may be attributed to the lack of maintenance of the sidewalk subgrade moisture content after the initial subgrade preparation. It should be noted that the moisture content requirement of the clayey subgrades (at least 2 percent above the optimum moisture) is an important requirement considering the expansive
nature of the on-site clayey soils. Therefore, the subgrade soils below the sidewalks should be properly moisture-conditioned and kept moist until placement of the select granular fill and concrete. In addition, consideration may be given to structurally connecting the two abutting slabs with dowels or other structural connections, especially at the entrances to the building and other openings in the walls.

It should be emphasized that the areas adjacent to the slabs should be backfilled tightly against the slab edges with low expansion, relatively impervious soils. These areas also should be graded to divert water away from the slabs and to reduce the potential for water ponding around the slabs and foundations.

3.4 Retaining Structures

Retaining structures, such as elevator pits and basement walls (if applicable), may be required for the project construction. Based on the subsurface conditions encountered, the following guidelines may be used for the preliminary design of retaining structures.

3.4.1 Wall Foundations

Parameters for design of foundations for retaining structures, such as elevator pit walls, that are structurally connected to (or abutting) new structures supported on deep foundations should also be designed in accordance with the deep foundation recommendations.

For site retaining walls and other retaining structures that are not structurally connected to (or abutting) new structures supported on deep foundations, the retaining structure foundations may be designed in accordance with the “Shallow Foundations” section herein. Wall footings should have a minimum width of 18 inches. In addition, the bottom of wall footings on relatively flat areas should be embedded a minimum depth of 24 inches below the lowest adjacent finished grade.

Retaining wall foundations should be at least 18 inches wide and the bottom should be embedded a minimum of 24 inches below the lowest adjacent finished grades. For sloping ground conditions, the footing should extend deeper to obtain a minimum 6-foot setback distance measured horizontally from the outside edge of the footing (base of footing) to the face of the slope. Wall footings oriented parallel to the direction of the slope should be constructed in stepped footings.

3.4.2 Lateral Earth Pressures

Retaining structures should be designed to resist the lateral earth pressures due to the adjacent soils and surcharge effects. The recommended lateral earth pressures for design of retaining walls, expressed in equivalent fluid pressures of pounds per square foot per foot of depth (pcf), are presented in the following table for retaining wall backfills consisting of on-site clayey soils. These lateral earth pressures do not include hydrostatic pressures that might be caused by groundwater trapped behind the structures.

<table>
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<tr>
<th>Backfill Condition</th>
<th>Earth Pressure Component</th>
<th>Active (pcf)</th>
<th>At-Rest (pcf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level Backfill</td>
<td>Horizontal</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Maximum 2H:1V Sloping Backfill</td>
<td>Horizontal</td>
<td>58</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>29</td>
<td>38</td>
</tr>
</tbody>
</table>

We recommend compacting the backfill behind retaining structures to between 90 and 95 percent relative compaction. Over-compaction of the retaining structure backfill should be avoided. The backfill materials should be moisture-conditioned to above the optimum moisture content prior to being utilized as backfill materials.

In general, the at-rest condition should be used for retaining structures where the top of the structure is restrained from movement prior to backfilling of the wall. The active condition should be used only for gravity retaining walls and retaining structures that are free to deflect by as much as 0.5 percent of the wall height.

Surcharge stresses due to areal surcharges, line loads, and point loads within a horizontal distance equal to the depth of the retaining structures should be considered in the design. For uniform surcharge stresses imposed on the loaded side
of the retaining structure, a rectangular distribution with a uniform pressure equal to 50 percent of the vertical surcharge pressure acting on the entire height of the structure, which is restrained, may be used in the design. For retaining structures that are free to deflect (cantilever), a rectangular distribution equal to 33 percent of the vertical surcharge pressure acting over the entire height of the structure may be used for design.

3.4.3 Drainage
Retaining walls should be well-drained to reduce the build-up of hydrostatic pressures. A typical drainage system would consist of a 12-inch wide zone of permeable material, such as open-graded gravel (ASTM C33, No. 67 gradation), placed directly around a perforated pipe (perforations facing down) at the base of the wall discharging to an appropriate outlet or weepholes. As an alternative, a prefabricated drainage product, such as MiraDrain or EnkaDrain, may be used instead of the drainage material. The prefabricated drainage product also should be connected hydraulically to a perforated pipe at the base of the wall.

Backfill behind the permeable drainage zone may consist of compacted on-site materials or free-draining compacted fills, where specified by the designer. Unless covered by concrete slabs, the upper 12 inches of backfill should consist of low-expansion, relatively impervious materials to reduce the potential for excessive water infiltration behind the walls.

3.5 Ground Settlements
Ground settlements may be anticipated when substantial new fills are placed over the existing ground underlain by soft to medium stiff soils in the shallow subsurface to raise the site to the proposed finished grades. These ground settlements would affect the construction schedule and the earthwork quantity estimates for the project. In general, the anticipated ground settlements are primarily the result of the following two processes:

- Compression of the compacted fill material under its own weight.
- Consolidation and/or compression of the underlying in-situ soils induced by the new fill loads, especially where new fills are placed over soft and/or loose soil deposits.

As mentioned above, the southern portion of the site may be underlain by compressible lagoonal deposits in the shallow subsurface. Therefore, some settlement of the new fill materials imposed on the underlying soft native soils should be expected if substantial new fills are planned.

In order to reduce the effects of the potential ground settlements from the new fill loads, we recommend that the new fills be placed as soon as practical to allow the anticipated ground settlements to occur prior to construction of on-grade improvements on top. A fill settlement waiting period may need to be implemented (in areas with substantial fills over soft soils) after placement of the fills and prior to construction of the on-grade improvements on the fills. However, deep foundations and associated substructure elements (foundation caps and grade beams) planned for the heavily loaded structures may commence within the settlement waiting period because the deep foundations will extend through the surface fills and compressible deposits and into the underlying competent materials.

In general, the settlement rates for the potentially compressible soils could be slower and would require longer settlement waiting periods to reduce the effects of settlement on the on-grade improvements constructed in and on the fills. The settlement waiting period for fills constructed over the soft soils will depend on the thickness of the new fills and on the nature and thickness of the soft soils. Geolabs should be consulted when this information becomes available during the design phase of the project.

It should be recognized that it is difficult to accurately predict the exact time required for the filled ground to settle because the settlement rates are affected by variations in the subsoil structure and the history of the subsoil deposition. For the soft soils anticipated towards the southern portion of the project site, we believe the estimated settlement period could vary by as much as 50 to 100 percent from the actual settlement period. Therefore, the actual settlement rates should be monitored, and a settlement monitoring program may need to be established to evaluate the magnitude and rate of the estimated settlements during the settlement waiting period prior to construction of improvements on the fills. In addition, provisions should be made for potential delays in the construction schedule if a longer settlement waiting period is required.
3.6 Site Grading

We understand that the design finished grades of the redevelopment project have not been set at this time. As mentioned above, new fills placed over the soft compressible soils towards the southern portion of the project site may induce some ground settlements due to the weight of the new fills placed. Therefore, special attention should be given to the discussions and recommendations presented in the “Ground Settlements” section herein. In addition, we envision substantial fills may be required to raise the existing grades up to the design finished grades after demolition of the existing stadium structure. Items of earthwork that are addressed in the subsequent subsections include the following:

1. Site Preparation
2. Fills and Backfills
3. Fill Placement and Compaction Requirements

A Geolabs representative should monitor the grading operations to observe whether undesirable materials are encountered during the excavation and scarification process and to confirm whether the exposed soil and/or rock conditions are similar to those encountered in our field exploration.

3.6.1 Site Preparation

At the on-set of earthwork, areas within the contract grading limits should be cleared and grubbed thoroughly. Vegetation, debris, deleterious materials, and other unsuitable materials should be removed and disposed of properly to reduce the potential for contaminating the excavated materials to be used as embankment fill materials.

Foundations and slabs of the existing structures to be demolished should be removed. Over-excavations resulting from the demolition operations should be backfilled with compacted fill material. Existing underground utilities to be abandoned should be removed, and the resulting excavation should be properly backfilled with the excavated on-site materials. The on-site materials should be moisture-conditioned to above the optimum moisture content, placed in 6 to 8-inch level loose lifts, and compacted to a minimum of 90 percent relative compaction. Utilities to be abandoned in-place under the proposed structure should be backfilled by pumping lean concrete or Controlled Low Strength Material (CLSM) under low pressure.

After clearing, grubbing, and demolition, the area within the building limits and extending at least 3 feet laterally should be over-excavated, where necessary. Subgrades, including cut areas, areas at grade, or areas designated to receive fills, should be scarified to a minimum depth of about 12 inches, moisture-conditioned to above the optimum moisture content, and compacted to a minimum of 90 percent relative compaction. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same soil determined in accordance with ASTM D1557. Optimum moisture is the water content (percentage by dry weight) corresponding to the maximum dry density.

Soft and/or loose, weak, yielding areas, or cavities disclosed during site preparation operations should be over-excavated to expose firm ground, and the resulting excavation should be backfilled with general fill materials compacted to a minimum of 90 percent relative compaction. The material resulting from the over-excavation should be removed and disposed of properly or used in landscaping areas, where appropriate.
Where shrinkage cracks are observed after the subgrade compaction, we recommend preparing the subgrade soil again as recommended above. Saturation and subsequent yielding of the exposed subgrade due to inclement weather and poor drainage may require over-excavating the soft areas and replacing these areas with well-compact ed fill. The need for over-excavation due to soft subgrade soil conditions should be evaluated in the field by a Geolabs representative.

3.6.2 Fills and Backfills
In general, the excavated on-site materials may be reused as a source of general fill materials provided that deleterious materials such as vegetation and/or organic matter are removed, and over-sized materials greater than 6 inches in maximum dimension are screened. However, the soft clayey silts with organic matter encountered towards the southern portion of the project site should not be reused as a source of general fill material and should be disposed of off-site properly.

Imported general fill materials needed to fill the site may consist of materials with a low to moderate expansion potential. Imported general fill materials should consist of soil materials with a maximum particle size of 3 inches or less with sufficient fines (between 10 and 60 percent particles passing the No. 200 sieve) to prevent the occurrence of voids in the compacted mass. In addition, general fill materials should have a CBR value of 8 or greater and a swell of 2 percent or less when tested in accordance with ASTM D1883. It should be noted that the general fill requirements presented herein are intended as guidelines only and may be modified based on additional laboratory testing and field observations on the available fill materials during construction.

Select granular fill materials required for the project construction should consist of non-expansive select granular material, such as crushed basalt. The material should be well-graded from coarse to fine with particles no larger than 3 inches in largest dimension and should contain up to 30 percent particles passing the No. 200 sieve. The material should have a laboratory California Bearing Ratio (CBR) value of 20 or more and should have a maximum swell of 1 percent or less when tested in accordance with ASTM D1883.

Where required, imported fill materials should be tested for conformance with these recommendations prior to delivery to the project site for the intended use. An accredited testing laboratory should test the imported fill materials for conformance with these recommendations prior to delivery to the project site for the intended use.

Aggregate base course and aggregate subbase materials should meet the material requirements for Base Course and Subbase Course as specified in Subsections 703.06 and 703.17, respectively, of the Hawaii Standard Specifications for Road and Bridge Construction (2005). Imported fill materials should be tested for conformance with these recommendations prior to delivery to the project site for the intended use.

3.6.3 Fill Placement and Compaction Requirements
General fill materials should be moisture-conditioned to above the optimum moisture, placed in level lifts of about 8 inches in loose thickness, and compacted to at least 90 percent relative compaction. Select granular fill materials should be moisture-conditioned to above the optimum moisture, placed in level lifts of about 12 inches in loose thickness, and compacted to at least 95 percent relative compaction. Aggregate base course and subbase materials should be moisture-conditioned to above the optimum moisture content, placed in level lifts not exceeding 6 inches in loose thickness, and compacted to a minimum of 95 percent relative compaction.

Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same soil established in accordance with ASTM D1557. Optimum moisture is the water content (percentage by weight) corresponding to the maximum dry density. Compaction should be accomplished by sheepsfoot rollers, vibratory rollers, or other types of acceptable compaction equipment. Water tamping, jetting, or ponding should not be allowed to compact the fills.
3.7 **Excavation**

Based on our field exploration results, the available boring data, and geologic information, the project site is underlain by variable subsurface materials ranging from stiff older alluvium overlying hard volcanic tuff formation at the northern portion of the project site to soft recent alluvium overlying hard basalt formation towards the southern portion of the premises.

In general, the contractor should determine the method and equipment to be used for excavations, subject to practical limits and safety considerations. We envision that conventional excavation techniques using a backhoe excavator may be used for the planned excavations. However, some localized areas of hard materials and/or obstructions may be encountered at the site. Therefore, the contractor may encounter difficult excavation conditions at localized areas, which should be expected considering the urban nature of the project site.

The above discussions regarding the rippability of the subsurface materials are based on the available subsurface information and our experience in the project vicinity. Site work contractors should be encouraged to examine the site conditions and the subsurface data to make their own reasonable and prudent interpretation.

The excavated soils should be stockpiled no closer than a horizontal distance equal to the depth of the excavation measured from the outside edge of the excavation in order to reduce the potential for appreciable ground movement. In addition, the excavated soils should be stockpiled at least 15 feet away from underground utilities to reduce the potential for ground movement or subsidence, which may damage the underground utility lines.

3.8 **Excavation Support**

Detailed information on the excavation depths were not available at the time this report was prepared for the master planning of the redevelopment project. However, we envision that relatively deep excavations may be required for the construction of the new stadium structure. Where excavations greater than 5 feet in depth are planned, temporary shoring or sloping and benching should be used unless stable rock formation is encountered.

Based on our field exploration, the northern portion of the project site and the upper fill soils in the southern portion of the project site generally consist of very stiff to hard clayey soils. It is our opinion that the stiff clayey soils may be classified as a Type A Soil profile for excavation purpose. Where space is available, an open-cut excavation may be used for the project construction. A slope inclination of three-fourth horizontal to 1 vertical (0.75H:1V) may be used for temporary cut slopes into the very stiff to hard clayey soils.

One possible method of shoring would be to use interlocking sheet pile shoring, especially for excavations extending into the soft recent alluvium towards the southern portion of the site. The use of a sheet pile shoring system may also serve as a cut-off wall to aid in the dewatering operations, which is further discussed in the “Dewatering” section herein. The sheet piles should be driven with a suitable hammer to a sufficient depth to reduce the potential for areal ground subsidence and to reduce the amount of dewatering within the excavations. It should be noted that some of the excavations will likely encounter very soft/loose soil deposits at the bottom of the excavation. Therefore, there is potential for bottom heave in these very soft/loose soil conditions. The contractor should carefully evaluate the potential for bottom heave and design the shoring system accordingly.

It is important to install adequate sheeting prior to the excavation and to maintain it tightly against the excavation walls with proper bracing during excavation. The properly braced sheeting is essential to reduce appreciable lateral movements of the adjacent ground into the excavation, which may result in potential settlements or distress to adjacent structures or other improvements, such as roads or utilities.

The excavation support and shoring system used must comply with applicable safety requirements. The contractor should be solely responsible for trench excavation and the adequacy and safety of the shoring installation. The contractor’s representative, who should be required to be continuously present on-site during excavation and construction works, will have the best opportunity to promptly observe changing conditions during construction, such as unforeseen subsoils, unexpectedly high
SECTION 3. DISCUSSION AND RECOMMENDATIONS

Based on the shallow groundwater levels anticipated towards the southern portion of the site, dewatering will be required if the bottom of the planned excavations extended below the groundwater level in this area. Therefore, dewatering provisions will need to be included in the contract documents for the proposed construction. Because the excavation may involve discharge of groundwater, a National Pollutant Discharge Elimination System (NPDES) permit will be required for this discharge. The contractor should consult their independent consultant for the latest regulations and information for the permit application.

Because of the cohesive nature of the alluvial clays in the upper subsurface soils, we anticipate the clayey soils are relatively impermeable. Therefore, dewatering of the excavation may involve low to medium volumes of water. In general, we do not recommend dewatering by means of a well point system along the outside of the excavations. The resultant areal depression of the natural groundwater table could induce consolidation of the compressible subsurface soils resulting in potential ground settlements, which could affect the adjacent existing structures. The potential impact of the dewatering system selected on depressing the natural groundwater table must be carefully evaluated by the contractor prior to dewatering.

It is our opinion that a cut-off wall system, such as interlocking steel sheet piles, should be considered to aid in dewatering the excavation. However, sumps will be needed to collect water that percolates up into the base of the excavation or infiltrates through the sheet piles. The sheet piles should be driven to a sufficient depth to reduce the potential for areal ground subsidence and to reduce the amount of dewatering needed within the excavations. Use of an interlocking sheet pile shoring support system with jet-grouted soils (or tremie concrete plug) is relatively watertight, which should allow the groundwater levels outside the excavations to be maintained close to the original pre-construction levels. Therefore, some type of groundwater control requirement should be specified in the contract documents.

Depending on the excavation depths, it should be noted that installation of the sheet pile shoring to the desired depths at the site may require the predrilling of the sheet pile locations due to the potential presence of hard volcanic tuff and/or basalt rock

groundwater table, inappropriate construction sequence or techniques, etc., which may affect shoring stability.

It is important to install adequate shoring and to maintain it tight against the excavation walls with proper bracing during construction. The properly braced shoring is essential to reduce the potential for appreciable lateral movements of the adjacent ground into the excavation, which may result in potential settlement or distress to adjacent structures or other improvements.

However, it must be noted that some minor movements of the shoring system and the adjacent ground may still occur due to changes in earth stresses during excavation. Due to the complexity of the stress changes, it is difficult to accurately estimate the magnitude of movement. The magnitude also depends greatly upon workmanship, such as how quickly and tightly the shoring and bracing supports are installed, the subsoil conditions, the size of the excavation, and the rate of excavation. In addition, it should be noted that settlement of the existing ground may occur as a result of the vibrations generated during the extraction of the sheet pile shoring. Therefore, the contractor should give special attention during the sheet pile removal process to reduce the potential for appreciable ground settlement.

It is important to realize that the excavation shoring should be installed properly and as early as practical. The adjacent ground should be continuously monitored for cracks, dips and/or other indications of movements with instruments until the sewer line excavation is finally backfilled. It should be noted that during and after installation of the shoring system, minor settlements may be possible. Therefore, it is recommended that the contractor retains a qualified geotechnical engineer to design and evaluate the shoring system used.

3.9 Dewatering

Dewatering of excavations will be necessary where the existing groundwater level is above the bottom of the proposed excavation. We encountered groundwater in our drilled borings at depths of about 12.6 (southern portion of the site) to 46.4 feet (northern portion of the site) below the ground surface at the time of our field exploration.
SECTION 3. DISCUSSION AND RECOMMENDATIONS

formation. The presence of these predrilled holes directly adjacent to the sheet pile shoring may serve as conduits for groundwater to infiltrate the sheet pile shored excavation. This condition could result in large volumes of seepage water to infiltrate the shored excavation requiring additional dewatering efforts and disposal of the dewatered effluent. Therefore, the contractor should take precautionary measures to avoid these conditions, which could contribute significantly to the dewatering requirements for the project.

The contractor is responsible for dewatering for construction and disposal of the dewatered effluent. The selection of equipment and methods of dewatering should be left up to the contractor, and he/she should be aware that modifications to the dewatering system may be required during construction depending on the conditions encountered. The dewatering method selected should have minimal impact on the groundwater level surrounding the proposed excavation. The dewatering operations should be coordinated with the shoring support such that the stability of the excavations is not jeopardized. The operations should be carried-out without softening the bottom of the excavations.

It is our opinion that the definition of “Dewatering” in the contract documents should be written to include works or systems required to lower the natural groundwater table and/or to exclude water from the excavations to allow construction of the proposed structures under safe and dry conditions. These works or systems may include, but are not limited to, pumping, cut-off walls, tremie concrete plugs, etc.

3.9.1 Subsurface Soil Permeability

Based on our borings and available soil data, the upper subsoils at the site may be considered impermeable or with relatively low permeability based on the materials encountered. In general, the contractor should pay special attention to the site-specific dewatering plan for the proposed excavations.

3.9.2 Dewatering Considerations

We suggest considering the following three basic criteria in selection of a suitable method of dewatering:

a. The dewatering method should result in the least disturbance or damage to existing buildings, roads, and environment.
b. The dewatering method should maintain stability of, and also provide safe and dry working conditions in, the excavation.
c. The dewatering method should be sufficiently flexible to allow modifications to accommodate various ground conditions.

3.9.3 Dewatering Precaution and Monitoring

The contractor must carefully evaluate the potential impact of the dewatering system selected on depressing the natural groundwater table prior to dewatering. The contractor should retain a qualified geotechnical engineer to design and evaluate the dewatering system used.

The contractor should be solely responsible for the impact and safety of the dewatering operations. His/her qualified representative, who should be continuously present on-site during dewatering activities, will have the best opportunity to promptly observe the effects of dewatering during construction and to implement, as soon as possible, necessary precautionary or remedial measures including, but not limited to, slowing down or stopping the dewatering operations.

Where encountered at the bottom of excavations, permeable granular soils may be susceptible to piping and “quick” conditions. The dewatering operations should be carried-out without creating a “quick” condition or softening at the excavation bottoms. Therefore, the project dewatering operations should be performed without pumping out soil fines (pumping clear water only) and should be coordinated with the shoring installation such that the excavation stability is not adversely affected. Excessive pumping, which removes soil fines, may result in “blowing” or heaving of the excavation bottom or sides.

Groundwater drawdown outside the excavation will cause additional settlement resulting from consolidation of the soft and/or loose compressible soils. Therefore, the use of a deep well system outside the excavations to draw down the groundwater level should not be allowed.
SECTION 3. DISCUSSION AND RECOMMENDATIONS

Special caution should also be taken to avoid dewatering utility trenches connected to the excavations. If this occurs, the granular bedding and/or backfill in the utility trenches could act as subdrains and cause significant areal groundwater drawdown. Significant areal groundwater drawdown would result in appreciable ground settlements and potential damage to utility lines and/or other adjacent existing structures.

3.10 **Pavement Design**

We envision both flexible and rigid pavements are planned for the new stadium and site redevelopment project. In general, we anticipate the vehicle loading for the parking lots will consist of primarily passenger vehicles, light pick-up trucks, and handivans. Vehicle loading for the access driveways and loading zones generally will consist of some heavy vehicular traffic, such as delivery and container trucks. Based on the slight to moderately expansive soil conditions, we recommend placing the pavement structural sections on a minimum 6-inch thick layer of non-expansive, select granular fill in lieu of aggregate subbase course. Based on the above assumptions, we recommend using the following flexible and rigid pavement sections for preliminary design purposes:

**Flexible Pavements Subjected to Light Vehicular Traffic and Parking Areas**
- 2.0-Inch Asphalitic Concrete
- 6.0-Inch Aggregate Base Course (95 Percent Relative Compaction)
- 8.0-Inch Total Pavement Thickness over 6-Inch Non-Expansive, Select Granular Fill

**Flexible Pavements Subjected to Delivery/Container Trucks and Access Roads**
- 3.0-Inch Asphalt Concrete
- 6.0-Inch Aggregate Base Course (95 Percent Relative Compaction)
- 9.0-Inch Total Pavement Thickness over 6-Inch Non-Expansive, Select Granular Fill

**Rigid Pavements**
- 6.0-Inch Portland Cement Concrete
- 6.0-Inch Aggregate Subbase (95 Percent Relative Compaction)
- 12.0-Inch Total Pavement Thickness over 6-Inch Non-Expansive, Select Granular Fill

The pavement subgrade soils should be scarified to a depth of at least 8 inches, moisture-conditioned to above the optimum moisture content, and compacted to no less than 95 percent relative compaction. Where scarification of the subgrades is not practical, subgrade materials should be proof-rolled with a minimum 10-ton vibratory drum roller for a minimum of eight passes. California Bearing Ratio tests and/or field observations should be performed on the actual subgrade materials during construction to confirm that the above design sections are adequate.

The aggregate base and subbase courses should also be compacted to a minimum of 95 percent relative compaction. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same soil determined in accordance with ASTM D1557. Optimum moisture is the water content (percentage by dry weight) corresponding to the maximum dry density.

Paved areas should be sloped, and drainage gradients should be maintained to carry the surface water off-site. Surface water ponding should not be allowed on-site during or after construction. Where concrete curbs are used to isolate landscaping in or adjacent to the pavement areas, we recommend extending the curbs a minimum of 2 inches into the soils below the aggregate base or subbase course layers to reduce the potential for migration of landscape water into the pavement section. Alternatively, a subdrain system could be constructed to collect excess water from landscaping irrigation. For long-term performance, we recommend constructing a subdrain system adjacent to the paved/landscaped areas.

3.11 **Underground Utility Lines**

We envision new on-site utility lines (i.e., water, sewer, and drain lines) and utility line connections adjacent to the project site may be required for the development. We anticipate most of the utility line trenches will be excavated in the compacted fills and/or stiff on-site soils. In general, we recommend using granular bedding consisting of 6 inches of free-draining granular materials (ASTM C33, No. 67 gradation) below the pipes for uniform support. Free-draining granular materials, such as No. 3B Fine gravel (ASTM C33, No. 67 gradation), also should be used for the initial trench backfill up to about 12 inches above the pipes.

It is critical to use this free-draining material to reduce the potential for formation of voids below the haunches of the pipes and to provide adequate support for the sides of the pipes. Improper backfill material around the pipes and improper placement of the backfill could result in backfill settlement and pipe damage.
SECTION 3. DISCUSSION AND RECOMMENDATIONS

As mentioned above, the southern portion of the site may be underlain by compressible lagoonal deposits in the shallow subsurface. Where soft and/or loose compressible soils are encountered at or near the invert elevations, we recommend providing a subgrade stabilization layer consisting of 18 to 24 inches of No. 2 Rock (ASTM C33, No. 4 gradation) wrapped in a non-woven filter fabric (Mirafi 180N or equivalent) below the bedding layer for uniform support. The stabilization layer should extend beyond the sides of the pipe a minimum width of one-fourth the outside diameter of the pipe or 12 inches, whichever is greater. A typical trench detail is provided on Plate 6.

The upper portion of the trench backfill from a level of 12 inches above the pipes to the top of the subgrade or finished grade may consist of the excavated granular materials with a maximum particle size of 6 inches or select granular fill materials. The backfill material should be moisture-conditioned to above the optimum moisture content, placed in maximum 8-inch level loose lifts, and mechanically compacted to at least 90 percent relative compaction. In areas where trenches will be in paved areas, the upper 3 feet of the trench backfill below the pavement finished grade should be compacted to no less than 95 percent relative compaction.

3.12 Drainage

Finished grades outside the new structures should be sloped to shed water away from the slabs and foundations and to reduce the potential for ponding around the structures. In addition, it is advised to install roof gutter systems around the buildings and to divert the discharge away from the slab and foundation areas. Excessive landscape watering near the slabs and foundations also should be avoided. Planters next to foundations should be avoided or have concrete bottoms and drains to reduce the potential for excessive water infiltration into the subsurface.

These drainage requirements are essential for the proper performance of the above foundation recommendations because ponded water could cause subsurface soil saturation and subsequent heaving or loss of strength. The foundation excavations should be properly backfilled against the walls or slab edges immediately after setting of the concrete to reduce the potential for excessive water infiltration into the subsurface.

Drainage swales should be provided as soon as possible and should be maintained to drain surface water runoff away from the slabs and foundations.

3.13 Additional Field Exploration

This exploration was conducted on a preliminary basis to obtain an overview of the general subsurface conditions within the New Aloha Stadium Master Plan Development area. The information and preliminary recommendations presented herein are intended to be solely in support of the master planning process; and, as such, may not be sufficient nor be appropriate for detailed design of the individual structures and site elements of the development. Therefore, we recommend that additional field exploration be conducted as the design for the individual structures and site elements progresses to allow for the formulation of project-specific recommendations for each structure and element.

END OF DISCUSSION AND RECOMMENDATIONS
SECTION 4. LIMITATIONS

The analyses and recommendations submitted herein are based in part upon information obtained from the field borings. Variations of the subsurface conditions between and beyond the field borings may occur, and the nature and extent of these variations may not become evident until construction is underway. If variations then appear evident, it will be necessary to re-evaluate the recommendations presented herein.

The locations of the field borings indicated in this report were approximate, having been staked out in the field using a hand-held Global Positioning System (GPS). Elevations of the field borings were estimated by interpolation from the spot elevations and contour lines shown on the Topographic Survey Map transmitted by Crawford Architects LLC on January 2, 2020. The physical locations and elevations of the borings should be considered accurate only to the degree implied by the methods used.

The stratification breaks shown on the graphic representations of the borings depict the approximate boundaries between soil and/or rock types and, as such, may denote a gradual transition. Water level data from the borings were measured at the times shown on the graphic representations and/or presented in the text of this report. These data have been reviewed and interpretations made in the formulation of this report. However, it must be noted that fluctuation may occur due to variation in tides, rainfall, perched groundwater conditions, groundwater withdrawal, and other factors.

This report has been prepared for the exclusive use of Crawford Architects LLC and their project consultants for specific application to the Aloha Stadium – Planning for New Stadium & Site Redevelopment project as described herein in accordance with generally accepted geotechnical engineering principles and practices. No warranty is expressed or implied.

This report has been prepared solely for the purpose of assisting the engineers in the master planning and preparation of the EIS documents for the redevelopment project. Therefore, this report may not contain sufficient data, or the proper information, for use to form the basis for preparation of construction cost estimates.

SECTION 4. LIMITATIONS

The owner/client should be aware that unanticipated subsurface conditions are commonly encountered. Unforeseen subsurface conditions, such as perched groundwater, soft deposits, hard layers, or cavities, may occur in localized areas and may require additional probing or corrections in the field (which may result in construction delays) to attain a properly constructed project. Therefore, a sufficient contingency fund is recommended to accommodate these possible extra costs.

This geotechnical engineering exploration conducted at the project site was not intended to investigate the potential presence of hazardous materials existing at the project site. It should be noted that the equipment, techniques, and personnel used to conduct a geo-environmental exploration differ substantially from those applied in geotechnical engineering.

END OF LIMITATIONS
REFERENCES

Department of Transportation Services, City and County of Honolulu (November 1, 2006), Honolulu High-Capacity Transit Corridor Project, Alternatives Analysis Report

Geoabls, Inc. (July 2017), Geotechnical Engineering Exploration, Stadium Marketplace Redevelopment, 4561 Salt Lake Boulevard, Honolulu, Oahu, Hawaii

Geoabls, Inc. (June 2014), Geotechnical Data Report, Honolulu Rail Transit Project (HTRP), Kamehameha Highway Station Group, Aloha Stadium Station, Aiea, Oahu, Hawaii

Geoabls, Inc. (April 2013), Geotechnical Planning Report, Honolulu Rail Transit Project (HRTP), Kamehameha Highway Station Group, Ewa, Oahu, Hawaii

Geoabls, Inc. (April 2013), Geotechnical Investigation Work Plan, Honolulu Rail Transit Project (HRTP), Kamehameha Highway Station Group, Ewa, Oahu, Hawaii

Geoabls, Inc. (February 2010), Geotechnical Data Report, Honolulu High-Capacity Transit Corridor Project, Airport Segment, Aiea to Middle Street, Honolulu, Oahu, Hawaii

Geoabls, Inc. (March 2009), Geotechnical Data Report, Honolulu High-Capacity Transit Corridor Project, East Kapolei to Pearl City Highlands, Ewa, Oahu, Hawaii


Kiewit Design-Build Team (October 2012) and Addendum #1 (October 2012), Geotechnical Data Report Stage 1, Kamehameha Highway Guideway Design-Build Segment, Honolulu Rail Transit Project

Masa Fujoka and Associates (May 2010), Geotechnical Report, Geotechnical Investigation, Proposed Aloha Stadium Service Towers, Haliwa, Oahu, Hawaii

United States Department of Agriculture Soil Conservation Service and the University of Hawaii Agricultural Experiment Station (August 1972), Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii
APPENDIX A

Field Exploration

We explored the subsurface conditions at the project site by drilling and sampling six borings, designated as Boring Nos. 1 through 6, extending to depths of about 51.5 to 152.5 feet below the existing ground surface. The approximate boring locations are shown on the Site Plan, Plate 2. The borings were drilled using a truck-mounted drill rig equipped with continuous flight augers and coring tools.

Our geologists classified the materials encountered in the borings by visual and textural examination in the field in general accordance with ASTM D2488, Standard Practice for Description and Identification of Soils, and monitored the drilling operations on a near-continuous (full-time) basis. These classifications were further reviewed visually and by testing in the laboratory. Soils were classified in general accordance with ASTM D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), as shown on the Soil Log Legend, Plate A-0.1. Deviations made to the soil classification in accordance with ASTM D2487 are described on the Soil Classification Log Key, Plate A-0.2. Graphic representations of the materials encountered are presented on the Logs of Borings, Plates A-1 through A-6.

Relatively “undisturbed” soil samples were obtained in general accordance with ASTM D3550, Ring-Lined Barrel Sampling of Soils, by driving a 3-inch OD Modified California sampler with a 140-pound hammer falling 30 inches. In addition, some samples were obtained from the drilled borings in general accordance with ASTM D1586, Penetration Test and Split-Barrel Sampling of Soils, by driving a 2-inch OD standard penetration sampler using the same hammer and drop. The blow counts needed to drive the sampler the second and third 6 inches of an 18-inch drive are shown as the “Penetration Resistance” on the Logs of Borings at the appropriate sample depths. The penetration resistance shown on the logs of borings indicates the number of blows required for the specific sampler type used. The blow counts may need to be factored to obtain the Standard Penetration Test (SPT) blow counts.

Pocket penetrometer tests were performed on selected cohesive soil samples in the field. The pocket penetrometer test provides an indication of the unconfined compressive strength of the sample. Results of the pocket penetrometer tests are summarized on the Logs of Borings at the appropriate sample depths.

Core samples of the rock materials encountered at the project site were obtained by using diamond core drilling techniques in general accordance with ASTM D2113, Diamond Core Drilling for Site Investigation. Core drilling is a rotary drilling method that uses a hollow bit to cut into the rock formation. The rock material left in the hollow core of the bit is mechanically recovered for examination and description. Rock cores were described in general accordance with the Rock Description System, as shown on the Rock Log Legend, Plate A-0.3. The Rock Description System is based on the publication

Recovery (REC) may be used as a subjective guide to the interpretation of the relative quality of rock masses, where appropriate. Recovery is defined as the actual length of material recovered from a coring attempt versus the length of the core attempt. For example, if 3.7 feet of material is recovered from a 5.0-foot core run, the recovery would be 74 percent and would be shown on the Logs of Borings as REC = 74%.

The Rock Quality Designation (RQD) is also a subjective guide to the relative quality of rock masses. RQD is defined as the percentage of the core run in rock that is sound material in excess of 4 inches in length without any discontinuities, discounting any drilling, mechanical, and handling induced fractures or breaks. If 2.5 feet of sound material is recovered from a 5.0-foot core run in rock, the RQD would be 50 percent and would be shown on the Logs of Borings as RQD = 50%. Generally, the following is used to describe the relative quality of the rock based on the "Practical Handbook of Physical Properties of Rocks and Minerals" by Robert S. Carmichael (1989).

The excavation characteristic of a rock mass is a function of the relative hardness of the rock, its relative quality, brittleness, and fissile characteristics. A dense rock formation with a high RQD value would be very difficult to excavate and probably would require more arduous methods of excavation.

### Rock Quality RQD

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<th>Rock Quality</th>
<th>RQD (%)</th>
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<tr>
<td>Very Poor</td>
<td>0 – 25</td>
</tr>
<tr>
<td>Poor</td>
<td>25 – 50</td>
</tr>
<tr>
<td>Fair</td>
<td>50 – 75</td>
</tr>
<tr>
<td>Good</td>
<td>75 – 90</td>
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<tr>
<td>Excellent</td>
<td>90 – 100</td>
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</tbody>
</table>

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**Note:** Dual symbols are used to indicate borderline soil classifications.
Rock Log Legend

**ROCK DESCRIPTIONS**

<table>
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<tr>
<th>Rock Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>BASALT</td>
<td>Basalt</td>
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<tr>
<td>CONGLOMERATE</td>
<td>Conglomerate</td>
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<tr>
<td>BOULDER</td>
<td>Boulders</td>
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<td>Limestone</td>
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<tr>
<td>BRECCIA</td>
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<tr>
<td>CLinker</td>
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<tr>
<td>SILTSTONE</td>
<td>Siltstone</td>
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<td>COBBLELS</td>
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<tr>
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<tr>
<td>VOID/CAHITY</td>
<td>Void/Cahty</td>
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</table>

**ROCK FRACTURE CHARACTERISTICS**

- **Massive**: Greater than 24 inches apart
- **Slightly Fractured**: 12 to 24 inches apart
- **Moderately Fractured**: 6 to 12 inches apart
- **Closely Fractured**: 3 to 6 inches apart
- **Severely Fractured**: Less than 3 inches apart

**DEGREE OF WEATHERING**

- **Unweathered**: No visible weathering, rock shows no sign of discoloration or loss of strength.
- **Slightly Weathered**: Slight discoloration inwards from open fractures.
- **Moderately Weathered**: Discoloration throughout and noticeably weakened though not able to break by hand.
- **Highly Weathered**: Most minerals decomposed with some cements present in residual soil mass. Can be broken by hand.
- **Extremely Weathered**: Saprolite. Mineral residue completely decomposed to soil but fabric and structure preserved.

**HARDNESS**

The following terms describe the resistance of a rock to indentation or scratching:

- **Very Hard**: Specimen breaks with difficulty after several "pinging" hammer blows. Example: Dacite, fine grain volcanic rock
- **Hard**: Specimen breaks with some difficulty after several hammer blows. Example: Vesicular, vugular, coarse-grained rock
- **Medium Hard**: Specimen can be broken by one hammer blow. Cannot be scraped or indented by knife. Example: Porous rhyolite
- **Soft**: Can be indented by one hammer blow. Can be scraped or peeled by knife. Example: Severe, cherty rock
- **Very Soft**: Crumbles under hammer blow. Can be peeled and carved by knife. Example: Sotolite

Grain Size Definition

<table>
<thead>
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<th>Description</th>
<th>Sieve Number / Size</th>
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<tbody>
<tr>
<td>Boulders</td>
<td>&gt; 12 inches (305-mm)</td>
</tr>
<tr>
<td>Cobblels</td>
<td>3 to 12 inches (75-mm to 305-mm)</td>
</tr>
<tr>
<td>Gravel</td>
<td>3-inch to #4 (75-mm to 4.75-mm)</td>
</tr>
<tr>
<td>Coarse Gravel</td>
<td>3-inch to 3/4-inch (75-mm to 19-mm)</td>
</tr>
<tr>
<td>Fine Gravel</td>
<td>3/4-inch to #4 (19-mm to 4.75-mm)</td>
</tr>
<tr>
<td>Sand</td>
<td>#4 to #200 (4.75-mm to 0.075-mm)</td>
</tr>
<tr>
<td>Coarse Sand</td>
<td>#4 to #10 (4.75-mm to 2-mm)</td>
</tr>
<tr>
<td>Medium Sand</td>
<td>#10 to #40 (2-mm to 0.425-mm)</td>
</tr>
<tr>
<td>Fine Sand</td>
<td>#40 to #200 (0.425-mm to 0.075-mm)</td>
</tr>
</tbody>
</table>

Moisture Content Definitions

- **Dry**: Absence of moisture, dry to the touch
- **Wet**: Visible free water

Abbreviations

- **WOH**: Weight of Hammer
- **WOR**: Weight of Drill Rods
- **SPT**: Standard Penetration Test Split-Spoon Sampler
- **MCS**: Modified California Sampler
- **PP**: Pocket Penetrometer

Soil Classification Log Key (with deviations from ASTM D2488)

**ROCK DESCRIPTION SYSTEM**

**EXAMPLE:**

- **Primary Constituents** are based on plasticity. Primary constituents are capitalized and bold (i.e., CLAY, SILT)
- **Secondary Constituents** are composed of a percentage less than the primary constituent, but more than 20 percent of the soil mass. Secondary constituents are capitalized and bold (i.e., SANDY, CLAYEY, CLAY, SILT)
- **Accessory Descriptions** are lower cased and follow the Primary and Secondary Constituents (i.e., SILTY, GRAVELLY)
- **Accessory Descriptions** with some: >12%
- **Accessory Descriptions** with a little: 5 - 12%
- **Accessory Descriptions** with traces of: <5%

**SOIL CLASSIFICATION SYSTEM**

**GRANULAR SOIL (- #200 <50%)**

- **PRIMARY constituents are composed of the largest percent of the soil mass. Primary constituents are capitalized and bold (i.e., GRAVEL, SAND)**
- **SECONDARY constituents are composed of a percentage less than the primary constituent. If the soil mass consists of 12 percent or more fines content, a cohesive constituent is used (SILTY or CLAYEY); otherwise, a granular constituent is used (GRAVELLY or SANDY), provided that the secondary constituent consists of 20 percent or more of the soil mass. Secondary constituents are capitalized and bold (i.e., SANDY, CLAYEY, SANDY, CLAY, CLAYEY, SAND, GRAY)**

**COHESIVE SOIL (- #200 >50%)**

- **PRIMARY constituents are based on plasticity. Primary constituents are capitalized and bold (i.e., CLAY, SILT)**
- **SECONDARY constituents are composed of a percentage less than the primary constituent, but more than 20 percent of the soil mass. Secondary constituents are capitalized and bold (i.e., SANDY, CLAY, CLAYEY, CLAYEY, SILT)**

**ACCESSORY DESCRIPTIONS**

- **Accessory descriptions** compose of the following:
  - with some: >12%
  - with a little: 5 - 12%
  - with traces of: <5%

**MOISTURE CONTENT DEFINITIONS**

- **Dry**: Absence of moisture, dry to the touch
- **Wet**: Visible free water

**RELATIVE DENSITY / CONSISTENCY**

<table>
<thead>
<tr>
<th>Granular Soils</th>
<th>Cohesive Soils</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Value (Blows/Foot)</td>
<td>Relative Density</td>
</tr>
<tr>
<td>SPT</td>
<td>MOC</td>
</tr>
<tr>
<td>0 - 4</td>
<td>0 - 4</td>
</tr>
<tr>
<td>4 - 10</td>
<td>7 - 18</td>
</tr>
<tr>
<td>10 - 30</td>
<td>18 - 55</td>
</tr>
<tr>
<td>&gt; 50</td>
<td>&gt; 91</td>
</tr>
<tr>
<td>&gt; 30</td>
<td>&gt; 55</td>
</tr>
</tbody>
</table>

**GRAIN SIZE DEFINITION**

- **Boulders**: 3 to 12 inches (75-mm to 305-mm)
- **Cobblels**: 3-inch to #4 (75-mm to 4.75-mm)
- **Gravel**: 3/4-inch to #4 (19-mm to 4.75-mm)
- **Fine Gravel**: #4 to #200 (4.75-mm to 0.075-mm)
- **Coarse Sand**: #4 to #10 (4.75-mm to 2-mm)
- **Medium Sand**: #10 to #40 (2-mm to 0.425-mm)
- **Fine Sand**: #40 to #200 (0.425-mm to 0.075-mm)

**MOISTURE CONTENT DEFINITIONS**

- **Dry**: Absence of moisture, dry to the touch
- **Wet**: Visible free water

**APPENDIX**

- **Soil descriptions are based on ASTM D2488-09a, Visual-Manual Procedure, with the above modifications by Geolabs, Inc. to the Unified Soil Classification System (USCS).**
### Description

**2-inch ASPHALTIC CONCRETE**

- Grayish brown CLAYEY SILT with some gravel (basaltic), very stiff, moist (fill)
- Brown SILTY CLAY, very stiff, moist (older alluvium)

**SANDY SILT**

- Brown, hard, moist (older alluvium)
- Grades to grayish brown
- Grades with thin silty sand lenses locally
- Grades with subrounded gravel (basaltic) locally
- Grades to gray clayey silt with some sand locally
- Grades to brown
- Grades with thin silty sand lenses locally

**TUFF**

- Gray to brown TUFF, slightly to moderately weathered, medium hard to hard (volcanic tuff)

**CLAYEY SILT**

- Grades with gravel (basaltic)
- Gray SILTY SAND (BASALTIC) with a little gravel, medium dense, moist (older alluvium)

**SILTY CLAY**

- Gray to brown
- Grades with thin silty sand lenses locally

**SANDY SILT**

- Grades with thin silty sand lenses locally

**Laboratory Tests**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Moisture Content (%)</th>
<th>Dry Density (pcf)</th>
<th>USCS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM</td>
<td>4.037</td>
<td>152</td>
<td>SF</td>
<td>Laboratory</td>
</tr>
<tr>
<td>LL=65</td>
<td>50/3&quot;</td>
<td>52</td>
<td>ML</td>
<td>Field</td>
</tr>
<tr>
<td>TXUU</td>
<td>48</td>
<td>50/3&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Other Tests**

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Recovery (%)</td>
<td>100</td>
</tr>
<tr>
<td>RQD (%)</td>
<td>100</td>
</tr>
<tr>
<td>Pocket Pen. (tsf)</td>
<td>100</td>
</tr>
</tbody>
</table>

**Date Started:** September 30, 2019  
**Date Completed:** September 30, 2019  
**Logged By:** S. Latronic  
**Work Order:** 7963-00  
**Drilling Method:** 4" Solid Stem Auger  
**Driving Energy:** 140 lb. wt., 30 in. drop
### Description

<table>
<thead>
<tr>
<th>Laboratory</th>
<th>Field</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dry Density (pcf)</strong></td>
<td><strong>Sample Moisture Content (%)</strong></td>
</tr>
<tr>
<td>2.5-inch ASPHALTIC CONCRETE</td>
<td>30</td>
</tr>
<tr>
<td>2.5-inch ASPHALTIC CONCRETE</td>
<td>28</td>
</tr>
<tr>
<td>2.5-inch ASPHALTIC CONCRETE</td>
<td>22</td>
</tr>
<tr>
<td>2.5-inch ASPHALTIC CONCRETE</td>
<td>28</td>
</tr>
<tr>
<td>2.5-inch ASPHALTIC CONCRETE</td>
<td>89</td>
</tr>
<tr>
<td>2.5-inch ASPHALTIC CONCRETE</td>
<td>73</td>
</tr>
</tbody>
</table>

**Approximate Ground Surface**

- **Elevation (feet):** 31'

---

**Other Tests**

- **Pocket Pen. (tsf):**
- **Plate:**
- **Pocket Pen. (tsf):**

---

**Date Started:** October 10, 2019
**Date Completed:** October 10, 2019
**Logged By:** S. Latronic
**Work Order:** 7963-00
**Drilling Method:** 4'' Solid Stem Auger & PQ Coring
**Driving Energy:** 140 lb. wt., 30 in. drop

---

**Plate**: A - 3.1

---

**Date Started:** October 10, 2019
**Date Completed:** October 10, 2019
**Logged By:** S. Latronic
**Work Order:** 7963-00
**Drilling Method:** 4'' Solid Stem Auger & PQ Coring
**Driving Energy:** 140 lb. wt., 30 in. drop

---

**Plate**: A - 3.2
### Description

<table>
<thead>
<tr>
<th>Sample</th>
<th>Moisture Content (%)</th>
<th>Dry Density (pcf)</th>
<th>Depth (feet)</th>
<th>Field Tests</th>
<th>Laboratory Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>TXUU</td>
<td>S&lt;sub&gt;u&lt;/sub&gt;=5.2 ksf</td>
<td></td>
<td>24 101</td>
<td>88</td>
<td>15</td>
</tr>
<tr>
<td>LL=68</td>
<td>38</td>
<td>13</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Consol.</td>
<td>70 57</td>
<td>5 0.5</td>
<td></td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>284</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TXUU</td>
<td>Brown GRANITE (BASALTIC) with a little gravel (basaltic), very stiff, moist (fill)</td>
</tr>
<tr>
<td>LL=68</td>
<td>71</td>
</tr>
<tr>
<td>Consol.</td>
<td>70 57</td>
</tr>
<tr>
<td>284</td>
<td>3</td>
</tr>
</tbody>
</table>

**Notes:**
- **Approximate Ground Surface:** Elevation (feet): 35 ft
- **Date Started:** October 7, 2019
- **Date Completed:** October 11, 2019
- **Logged By:** S. Latronic
- **Drill Rig:** CME-75DG2
- **Work Order:** 7963-00
- **Driving Energy:** 140 lb wt., 30 in. drop
- **Drilling Method:** 4" Solid Stem Auger & PQ Coring
- **Water Level:** A - 4.1
- **Energy Transfer Ratio:** 81%
**ALOHA STADIUM PLANNING FOR NEW STADIUM & SITE REDEVELOPMENT**  
HALAWA, OAHU, HAWAII

**Laboratory**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grayish brown SANY SILT with some decomposed gravel and remnant rock structure, very stiff (saprolite)</td>
<td></td>
</tr>
<tr>
<td>Brownish gray to gray vugular BASALT, closely fractured, moderately to highly weathered, soft to medium hard (a'a basalt)</td>
<td></td>
</tr>
<tr>
<td>Gray and brown SANY SILT with some decomposed gravel and remnant rock structure, medium dense (saprolite)</td>
<td></td>
</tr>
<tr>
<td>Gray vugular BASALT, moderately to closely fractured, slightly to moderately weathered, medium hard to hard (a'a basalt)</td>
<td></td>
</tr>
</tbody>
</table>

**Field**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray with brown mottling BASALT, moderately to closely fractured, moderately to highly weathered, soft to medium hard (welded clinker)</td>
<td></td>
</tr>
<tr>
<td>Gray vugular BASALT, moderately fractured, slightly weathered, hard to very hard (a’a basalt)</td>
<td></td>
</tr>
<tr>
<td>Brown with multi-color mottling BASALT, closely fractured, moderately weathered, medium hard (welded clinker)</td>
<td></td>
</tr>
<tr>
<td>Boring terminated at 125 feet</td>
<td></td>
</tr>
</tbody>
</table>

**Other Tests**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>16</td>
</tr>
<tr>
<td>74</td>
<td>30</td>
</tr>
<tr>
<td>61</td>
<td>98</td>
</tr>
<tr>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**Dry Density (pcf)**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>16</td>
</tr>
<tr>
<td>74</td>
<td>30</td>
</tr>
<tr>
<td>61</td>
<td>98</td>
</tr>
<tr>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**Moisture Content (%)**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>16</td>
</tr>
<tr>
<td>74</td>
<td>30</td>
</tr>
<tr>
<td>61</td>
<td>98</td>
</tr>
<tr>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**RQD (%)**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>16</td>
</tr>
<tr>
<td>74</td>
<td>30</td>
</tr>
<tr>
<td>61</td>
<td>98</td>
</tr>
<tr>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**Core Recovery (%)**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>16</td>
</tr>
<tr>
<td>74</td>
<td>30</td>
</tr>
<tr>
<td>61</td>
<td>98</td>
</tr>
<tr>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**Date Started:** October 7, 2019  
**Date Completed:** October 11, 2019  
**Logged By:** S. Latronic  
**Work Order:** 7963-00  
**Drilling Method:** 4" Solid Stem Auger & PQ Coring  
**Driving Energy:** 140 lb. wt., 30 in. drop
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Moisture Content (%)</th>
<th>Core Recovery (%)</th>
<th>RQD (%)</th>
<th>Penetration Resistance (blows/foot)</th>
<th>Pocket Pen. (tsf)</th>
<th>USCS</th>
<th>Silt</th>
<th>CME-75DG2</th>
<th>4&quot; Solid Stem Auger &amp; PQ Coring 140 lb. wt., 30 in. drop</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>25</td>
<td>5</td>
<td>3.0</td>
<td>0.8</td>
<td>125</td>
<td>CH</td>
<td>0.3</td>
<td>175</td>
<td>4-inch ASPHALTIC CONCRETE</td>
</tr>
<tr>
<td>48</td>
<td>73</td>
<td>5</td>
<td>3.0</td>
<td>0.8</td>
<td>125</td>
<td>CH</td>
<td>0.3</td>
<td>175</td>
<td>Gray SANDY GRAVEL (BASALTIC) with a little silt, dense, moist (base course)</td>
</tr>
<tr>
<td>45</td>
<td>4</td>
<td>10</td>
<td>0.8</td>
<td>0.3</td>
<td>175</td>
<td>CH</td>
<td>0.3</td>
<td>175</td>
<td>Brown SILTY CLAY, stiff, moist (fill)</td>
</tr>
<tr>
<td>54</td>
<td>72</td>
<td>13</td>
<td>3.0</td>
<td>0.8</td>
<td>125</td>
<td>CH</td>
<td>0.3</td>
<td>175</td>
<td>Brown CLAYEY SILT with some sand, stiff to very stiff, moist (fill)</td>
</tr>
<tr>
<td>58</td>
<td>2</td>
<td>20</td>
<td>0.8</td>
<td>0.3</td>
<td>175</td>
<td>CH</td>
<td>0.3</td>
<td>175</td>
<td>TV 87 48 4 0.8</td>
</tr>
<tr>
<td>67</td>
<td>59</td>
<td>2</td>
<td>0.3</td>
<td>0.8</td>
<td>0.3</td>
<td>CH</td>
<td>0.3</td>
<td>175</td>
<td>grades to gray</td>
</tr>
<tr>
<td>84</td>
<td>2</td>
<td>30</td>
<td>0.3</td>
<td>0.8</td>
<td>0.3</td>
<td>CH</td>
<td>0.3</td>
<td>175</td>
<td>16.7 ft.</td>
</tr>
</tbody>
</table>

Approximate Ground Surface Elevation (feet): 21

*Continued from previous plate*
### Description

**74**
- **TV**
  - **Moisture Content (%)**: 2
  - **RQD (%)**: 5
  - **Site**: MH
  - **Description**: Grades with silty sand lenses locally

**62**
- **Direct Shear**
  - **Moisture Content (%)**: 1
  - **RQD (%)**: 5
  - **Site**: CH
  - **Description**: Dark gray **Silty Sand (BASALTIC)**, loose (recent alluvium)

**56**
- **Sieve #200 = 48.1%**
  - **Moisture Content (%)**: 17
  - **RQD (%)**: 3
  - **Site**: CH
  - **Description**: Grades with clayey silt seams locally

**16**
- **Moisture Content (%)**: 82
  - **RQD (%)**: 1
  - **Site**: GM
  - **Description**: Gray subrounded **Sandy Gravel (BASALTIC)** with a little silt, very dense (stream deposit)

**12**
- **Moisture Content (%)**: 54
  - **RQD (%)**: 20/0%
  - **Site**: GM
  - **Description**: Orangish brown **Clayey Silt** with a little sand, very stiff to hard (older alluvium)

**50**
- **TXUU**
  - **S = 1.3 ksf**
  - **RQD (%)**: 50
  - **Site**: CH
  - **Description**: Orangish brown **Silty Clay**, very stiff (older alluvium)

**43**
- **S = 1.3 ksf**
  - **RQD (%)**: 43
  - **Site**: CH
  - **Description**: Grades with clayey silt seams locally

**40**
- **S = 1.3 ksf**
  - **RQD (%)**: 40
  - **Site**: CH
  - **Description**: Reddish brown **Silty Clay** with some cobbles (basaltic), very stiff (older alluvium)

**36**
- **S = 1.3 ksf**
  - **RQD (%)**: 36
  - **Site**: CH
  - **Description**: Clayey **Silt** with some fine sand, very stiff (older alluvium)

**35**
- **S = 1.3 ksf**
  - **RQD (%)**: 35
  - **Site**: CH
  - **Description**: Gray **Sandy Silt** with some decomposed gravel, very stiff to hard (saprolite)
Brownish gray to gray vuggy BASALT, closely to severely fractured, moderately to highly weathered, soft to medium hard (‘a’a basalt) grades with weathered clinker locally.

Boring terminated at 152.5 feet.

4-inch ASPHALTIC CONCRETE
Grayish brown SILTY GRAVEL with some sand, medium dense, moist (fill)
Brown CLAYEY Silt with some sand and a little fine gravel, stiff, moist (fill)
Brown SILTY CLAY with some sand, soft to medium stiff, moist (fill)
Dark grayish brown CLAYEY Silt with a little sand, medium stiff, moist (recent alluvium)
Brown SILTY SAND (BASALTIC) with some clay and gravel (basaltic), loose (recent alluvium)
Gray CLAYEY Silt with a little fine gravel, soft (lagoonal deposit)

grades with a little shells, medium stiff
**ALOHA STADIUM**
**PLANNING FOR NEW STADIUM & SITE REDEVELOPMENT**
**HALAWA, OAHU, HAWAII**

**Log of Boring**

### Laboratory Results

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Lab Test</th>
<th>Moisture Content (%)</th>
<th>Dry Density (pcf)</th>
<th>Core Recovery (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3</td>
<td>TXUU</td>
<td>82</td>
<td>5</td>
<td>0.3</td>
</tr>
</tbody>
</table>

- **Description**: Slightly clayey gravel, stiff (older alluvium)

### Field Results

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Sample</th>
<th>Moisture Content (%)</th>
<th>Dry Density (pcf)</th>
<th>Penetration Resistance (blows/foot)</th>
<th>Core Recovery (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3</td>
<td>TXUU</td>
<td>67</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>

- **Description**: Slightly clayey gravel, stiff (older alluvium)

**Date Started**: September 23, 2019
**Date Completed**: September 24, 2019
**Logged By**: D. Gremminger
**Work Order**: 7963-00
**Drilling Method**: CME-75DG2 4" Solid-Stem Auger & PQ Coring

**Water Level**: 5.2 ft.
**Driving Energy**: 140 lb. wt., 30 in. drop
**ALOHA STADIUM**  
**PLANNING FOR NEW STADIUM & SITE REDEVELOPMENT**  
**HALAWA, OAHU, HAWAII**  

**Log of Boring**

<table>
<thead>
<tr>
<th>Laboratory</th>
<th>Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Tests</td>
<td>Moisture Content (%)</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>68 57 21 3.0</td>
<td>0</td>
</tr>
<tr>
<td>LL = 72 P1 = 42</td>
<td>74 6 0</td>
</tr>
<tr>
<td>TXUU S&lt;sub&gt;n&lt;/sub&gt; = 2.0 ksf</td>
<td>57 62 17 2.0</td>
</tr>
<tr>
<td>53 12 0</td>
<td>0</td>
</tr>
<tr>
<td>49 71 54</td>
<td>0</td>
</tr>
<tr>
<td>Sieve #200 = 23.4%</td>
<td>49 50 0</td>
</tr>
<tr>
<td>42 76 48</td>
<td>0</td>
</tr>
</tbody>
</table>

(Continued from previous plate)

**Date Started:** September 23, 2019  
**Date Completed:** September 24, 2019  
**Logged By:** D. Gremminger  
**Work Order:** 7963-00  
**Drilling Method:** 4" Solid-Stem Auger & PQ Coring  
**Driving Energy:** 140 lb. wt., 30 in. drop  
**Total Depth:** 152.5 feet  

**Description**

- **grades to medium stiff**
- **grades to stiff**
- **grades to medium stiff**
- **grades to stiff**
- **grades to very dense**
- **grades to medium dense**
- **grades with some highly weathered boulders (basaltic)**
- **Brown CLAYEY SILT with some fine sand, stiff (older alluvium)**

**Date Started:** September 23, 2019  
**Date Completed:** September 24, 2019  
**Logged By:** D. Gremminger  
**Work Order:** 7963-00  
**Drilling Method:** 4" Solid-Stem Auger & PQ Coring  
**Driving Energy:** 140 lb. wt., 30 in. drop  
**Total Depth:** 152.5 feet  

**Boring terminated at 152.5 feet**
APPENDIX B

Laboratory Tests

Moisture Content (ASTM D2216) and Unit Weight (ASTM D2937) determinations were performed on selected soil samples as an aid in the classification and evaluation of soil properties. The test results are presented on the Logs of Borings at the appropriate sample depths.

Twelve Atterberg Limits tests (ASTM D4318) were performed on selected soil samples to evaluate the liquid and plastic limits to aid in soil classifications. The test results are summarized on the Logs of Borings at the appropriate sample depths. Graphic presentations of the test results are provided on Plates B-1 and B-2.

Three Sieve Analysis tests (ASTM C117 & C136) were performed on selected soil samples to evaluate the gradation characteristics of the soils and to aid in soil classification. Graphic presentation of the grain size distribution is provided on Plate B-3.

Four one-inch Ring Swell tests were performed on relatively undisturbed or remolded samples to evaluate the swelling potential of the near-surface soils. The test results are summarized on Plate B-4.

Seven Uniaxial Compressive Strength tests (ASTM D7012, Method C) were performed on selected intact core runs to evaluate the unconfined compressive strength of the volcanic tuff and basalt formation encountered. The test results are presented on Plate B-5.

Thirteen Unconsolidated Undrained Triaxial Compression tests (ASTM D2850) were performed on selected soil samples to evaluate the undrained shear strength of the in-situ soils. The approximate in-situ effective overburden pressure was used as the applied confining pressure for the relatively “undisturbed” soil sample. The test results and the stress-strain curves are presented on Plates B-6 through B-18.

One Direct Shear test (ASTM D3080) was performed on a selected sample to evaluate the shear strength characteristics of the material tested. The test results are presented on Plate B-19.

Three Consolidation tests with time rates (ASTM D2435) were performed on samples of the potentially compressible soils to evaluate the compressibility characteristics of the materials encountered. Results of the consolidation tests are presented on Plates B-20 through B-22.

Two laboratory soaked California Bearing Ratio tests (ASTM D1883) were performed on selected bulk soil samples to evaluate the pavement support characteristics of the soils. The test results are presented on Plates B-23 and B-24.
Appendix B
Laboratory Tests

Two Modified Proctor compaction tests (ASTM D1557, Method B) were performed on selected bulk soil samples to evaluate the relationship between the moisture content and the dry density of the near-surface soils. The test results are presented on Plates B-25 and B-26.

Two Expansion Index of Soil tests were performed on selected bulk samples of the near-surface soils in general accordance with ASTM D4829. The test is a standardized test used to determine the expansive characteristics of the soil. The Expansion Index of Soil test is the same test (UBC Standard 18-2) described in the Uniform Building Code (UBC) to determine the expansive characteristics of soils. The test results are summarized on Plate B-27.

Three sets of Corrosivity tests, including pH (ASTM G51), Minimum Resistivity (ASTM G57), Chloride Content (EPA 300.0), and Sulfate Content (EPA 300.0), were performed by our office and TestAmerica Laboratories, Inc. on selected soil samples obtained from our field exploration. The test results are summarized on Plate B-28.

---

### Table: Atterberg Limits Test Results - ASTM D4318

<table>
<thead>
<tr>
<th>Sample</th>
<th>Depth (ft)</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1</td>
<td>20.0-22.0</td>
<td>98</td>
<td>38</td>
<td>60</td>
<td>Brown silty clay (CH) with a little fine sand</td>
</tr>
<tr>
<td>B-2</td>
<td>20.0-21.5</td>
<td>65</td>
<td>49</td>
<td>16</td>
<td>Gray clayey silt (MH) with some sand</td>
</tr>
<tr>
<td>B-3</td>
<td>30.0-32.0</td>
<td>91</td>
<td>49</td>
<td>42</td>
<td>Grayish brown clayey silt (MH) with a little fine sand</td>
</tr>
<tr>
<td>B-4</td>
<td>19.5-21.5</td>
<td>68</td>
<td>31</td>
<td>37</td>
<td>Dark brown silty clay (CH) with some sand and a little gravel</td>
</tr>
<tr>
<td>B-5</td>
<td>40.0-42.0</td>
<td>78</td>
<td>37</td>
<td>41</td>
<td>Dark gray clayey silt (MH)</td>
</tr>
<tr>
<td>B-4</td>
<td>70.0-72.0</td>
<td>41</td>
<td>38</td>
<td>3</td>
<td>Grayish brown sandy silt (ML) with some gravel</td>
</tr>
<tr>
<td>B-5</td>
<td>20.0-22.0</td>
<td>60</td>
<td>31</td>
<td>32</td>
<td>Dark gray silty clay (CH)</td>
</tr>
<tr>
<td>B-5</td>
<td>51.0-53.0</td>
<td>92</td>
<td>54</td>
<td>38</td>
<td>Dark gray clayey silt (MH)</td>
</tr>
<tr>
<td>B-6</td>
<td>31.0-32.5</td>
<td>71</td>
<td>36</td>
<td>35</td>
<td>Gray clayey silt (MH)</td>
</tr>
<tr>
<td>B-6</td>
<td>41.0-42.5</td>
<td>86</td>
<td>55</td>
<td>31</td>
<td>Gray clayey silt (MH)</td>
</tr>
</tbody>
</table>

NP = NON-PLASTIC

---

![Diagram of Atterberg Limits Test Results](image)
ATTERBERG LIMITS TEST RESULTS - ASTM D4318

<table>
<thead>
<tr>
<th>Sample</th>
<th>Depth (ft)</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-6</td>
<td>81.0-82.5</td>
<td>95</td>
<td>40</td>
<td>55</td>
<td>Brown with gray mottling silty clay (CH)</td>
</tr>
<tr>
<td>B-6</td>
<td>111.0-112.5</td>
<td>72</td>
<td>30</td>
<td>42</td>
<td>Brown silty clay (CH) with some fine sand</td>
</tr>
</tbody>
</table>

NP = NON-PLASTIC

GEOLABS, INC.
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PLANNING FOR NEW STADIUM & SITE REDEVELOPMENT
HALAWA, OAHU, HAWAII

W.O. 7963-00
Plate B - 2

GRAIN SIZE DISTRIBUTION - ASTM C117 & C136

<table>
<thead>
<tr>
<th>Sample</th>
<th>Depth (ft)</th>
<th>D100 (mm)</th>
<th>D60 (mm)</th>
<th>D30 (mm)</th>
<th>D10 (mm)</th>
<th>%Gravel</th>
<th>%Sand</th>
<th>%Fine</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-4</td>
<td>90.0-92.0</td>
<td>4.75</td>
<td>1.12</td>
<td>0.43</td>
<td>0.0</td>
<td>0.0</td>
<td>38.3</td>
<td>61.7</td>
</tr>
<tr>
<td>B-5</td>
<td>91.0-93.0</td>
<td>19.0</td>
<td>2.111</td>
<td>0.235</td>
<td>19.4</td>
<td>57.2</td>
<td>23.4</td>
<td></td>
</tr>
<tr>
<td>B-6</td>
<td>131.0-132.5</td>
<td>2.111</td>
<td>0.235</td>
<td>19.4</td>
<td>57.2</td>
<td>23.4</td>
<td>0.1</td>
<td>48.1</td>
</tr>
</tbody>
</table>

GEOLABS, INC.
GEOENGINEERING

ALOHA STADIUM
PLANNING FOR NEW STADIUM & SITE REDEVELOPMENT
HALAWA, OAHU, HAWAII

W.O. 7963-00
Plate B - 3
### SUMMARY OF RING SWELL TESTS

| Location | Depth (feet) | Soil Description                  | Dry Density (pcf) | Moisture Contents | Ring Swell (% | | | |
|----------|--------------|-----------------------------------|-------------------|-------------------|---------------| | | |
| B-2      | 2.0 - 3.5    | Brown silty clay                  | 91.4              | 30.9              | 23.6          | 32.6          | 3.8          |
| B-3      | 2.0 - 4.0    | Brown clayey silt with a little sand (basaltic) | 86.8              | 32.5              | 25.5          | 42.1          | 10.9         |
| B-6      | 1.0 - 2.5    | Brown clayey silt with some sand and a little fine gravel | 83.4              | 33.0              | 24.3          | 38.6          | 1.1          |
| B-6      | 5.0 - 6.5    | Brown silty clay with some sand    | 64.2              | 58.6              | 47.4          | 61.4          | 3.0          |

**NOTE:** Samples tested were either relatively undisturbed or remolded in 2.4-inch diameter by 1-inch high rings. They were air-dried overnight and then saturated for 24 hours under a surcharge pressure of 55 psf.

* Relatively Undisturbed
** Remolded

---

### UNIAXIAL COMPRESSIVE STRENGTH TEST

<table>
<thead>
<tr>
<th>Location</th>
<th>Depth (feet)</th>
<th>Length (inches)</th>
<th>Diameter (inches)</th>
<th>Length/Diameter Ratio</th>
<th>Density (pcf)</th>
<th>Load (lbs)</th>
<th>Compressive Strength (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-3</td>
<td>45.5 - 51</td>
<td>6.690</td>
<td>3.260</td>
<td>2.05</td>
<td>123.4</td>
<td>26,020</td>
<td>3,120</td>
</tr>
<tr>
<td>B-3</td>
<td>51 - 56</td>
<td>6.850</td>
<td>3.270</td>
<td>2.09</td>
<td>136.3</td>
<td>35,920</td>
<td>4,280</td>
</tr>
<tr>
<td>B-3</td>
<td>56 - 61</td>
<td>6.840</td>
<td>3.270</td>
<td>2.09</td>
<td>132.1</td>
<td>27,800</td>
<td>3,310</td>
</tr>
<tr>
<td>B-3</td>
<td>61 - 66</td>
<td>6.840</td>
<td>3.260</td>
<td>2.10</td>
<td>134.3</td>
<td>33,890</td>
<td>4,060</td>
</tr>
<tr>
<td>B-4</td>
<td>100 - 103.5</td>
<td>6.810</td>
<td>3.270</td>
<td>2.08</td>
<td>156.7</td>
<td>22,690</td>
<td>2,700</td>
</tr>
<tr>
<td>B-4</td>
<td>105 - 110</td>
<td>6.810</td>
<td>3.270</td>
<td>2.08</td>
<td>141.9</td>
<td>4,180</td>
<td>500</td>
</tr>
<tr>
<td>B-4</td>
<td>110 - 115</td>
<td>6.770</td>
<td>3.250</td>
<td>2.08</td>
<td>110.0</td>
<td>920</td>
<td>110</td>
</tr>
</tbody>
</table>

**ASTM D7012 (METHOD C)**
Location: B-1
Depth: 15.0 - 16.5 feet
Description: Brown silty clay with a little fine sand
Test Date: 10/22/2019

<table>
<thead>
<tr>
<th>Dry Density (pcf)</th>
<th>66.6</th>
<th>Sample Diameter (inches)</th>
<th>2.417</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture (%)</td>
<td>44.2</td>
<td>Sample Height (inches)</td>
<td>5.267</td>
</tr>
<tr>
<td>Axial Strain at Failure (%)</td>
<td>4.3</td>
<td>Strain Rate (% / minute)</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Max. Deviator Stress (ksf): 8.6
Confining Stress (ksf): 1.5

Location: B-1
Depth: 25.0 - 26.5 feet
Description: Brown silty clay with a little fine sand
Test Date: 10/22/2019

<table>
<thead>
<tr>
<th>Dry Density (pcf)</th>
<th>62.0</th>
<th>Sample Diameter (inches)</th>
<th>2.417</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture (%)</td>
<td>56.7</td>
<td>Sample Height (inches)</td>
<td>5.133</td>
</tr>
<tr>
<td>Axial Strain at Failure (%)</td>
<td>7.1</td>
<td>Strain Rate (% / minute)</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Max. Deviator Stress (ksf): 10.6
Confining Stress (ksf): 2.5
**TRIAXIAL UU COMPRESSION TEST - ASTM D2850**

**Location:** B-2  
**Depth:** 25.0 - 26.5 feet  
**Description:** Brown sandy silt  
**Test Date:** 10/23/2019

<table>
<thead>
<tr>
<th>Dry Density (pcf)</th>
<th>67.7</th>
<th>Sample Diameter (inches)</th>
<th>2.420</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture (%)</td>
<td>50.2</td>
<td>Sample Height (inches)</td>
<td>5.133</td>
</tr>
<tr>
<td>Axial Strain at Failure (%)</td>
<td>3.8</td>
<td>Strain Rate (% / minute)</td>
<td>1.00</td>
</tr>
</tbody>
</table>

| Max. Deviator Stress (ksf): | 10.1 |
| Confining Stress (ksf):    | 2.5  |

**Location:** B-3  
**Depth:** 15.0 - 16.5 feet  
**Description:** Brown silty clay  
**Test Date:** 10/23/2019

<table>
<thead>
<tr>
<th>Dry Density (pcf)</th>
<th>83.9</th>
<th>Sample Diameter (inches)</th>
<th>2.403</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture (%)</td>
<td>28.3</td>
<td>Sample Height (inches)</td>
<td>5.033</td>
</tr>
<tr>
<td>Axial Strain at Failure (%)</td>
<td>6.1</td>
<td>Strain Rate (% / minute)</td>
<td>1.00</td>
</tr>
</tbody>
</table>

| Max. Deviator Stress (ksf): | 13.1 |
| Confining Stress (ksf):    | 2.0  |
### Sample B-3
- **Location**: B-3
- **Depth**: 35.0 - 36.5 feet
- **Description**: Grayish brown clayey silt with a little fine sand
- **Test Date**: 10/23/2019

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Density (pcf)</td>
<td>44.3</td>
</tr>
<tr>
<td>Moisture (%)</td>
<td>105.4</td>
</tr>
<tr>
<td>Axial Strain at Failure (%)</td>
<td>15.0</td>
</tr>
<tr>
<td>Max. Deviator Stress (ksf)</td>
<td>1.1</td>
</tr>
<tr>
<td>Confining Stress (ksf)</td>
<td>3.0</td>
</tr>
</tbody>
</table>

### Sample B-4
- **Location**: B-4
- **Depth**: 14.5 - 16.0 feet
- **Description**: Dark brown to brownish gray silty clay with some sand and a little gravel
- **Test Date**: 10/23/2019

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Density (pcf)</td>
<td>101.4</td>
</tr>
<tr>
<td>Moisture (%)</td>
<td>23.7</td>
</tr>
<tr>
<td>Axial Strain at Failure (%)</td>
<td>5.0</td>
</tr>
<tr>
<td>Max. Deviator Stress (ksf)</td>
<td>10.4</td>
</tr>
<tr>
<td>Confining Stress (ksf)</td>
<td>1.5</td>
</tr>
</tbody>
</table>
**Triaxial UU Compression Test - ASTM D2850**

**Location:** B-6

**Depth:** 36.0 - 37.5 feet

**Description:** Gray clayey silt

**Test Date:** 11/5/2019

**Max. Deviator Stress (ksf):** 0.8

**Confining Stress (ksf):** 2.0

**Dry Density (pcf):** 53.2

**Moisture (%):** 81.6

**Axial Strain at Failure (%):** 15.0

**Strain Rate (% / minute):** 1.00

**Triaxial UU Compression Test - ASTM D2850**

**Location:** B-6

**Depth:** 76.0 - 77.5 feet

**Description:** Brown with gray mottling silty clay

**Test Date:** 11/5/2019

**Max. Deviator Stress (ksf):** 2.2

**Confining Stress (ksf):** 3.6

**Dry Density (pcf):** 57.5

**Moisture (%):** 67.5

**Axial Strain at Failure (%):** 15.0

**Strain Rate (% / minute):** 1.00
Max. Deviator Stress (ksf): 4.1
Confining Stress (ksf): 5.3

Location: B-6
Depth: 116.0 - 117.5 feet
Description: Brown silty clay with some fine sand
Test Date: 11/5/2019

Dry Density (pcf): 62.2
Moisture (%): 57.3
Axial Strain at Failure (%): 15.0

Triaxial UU Compression Test - ASTM D2850

Sample #1
Sample #2
Sample #3

Moisture Content, %: 46.6 51.1 51.1
Dry Density, pcf: 72.1 69.8 70.9
Height, inches: 1.00 1.00 1.00
Moisture Content, %: 50.5 47.3 46.7
Dry Density, pcf: 71.1 69.8 70.9
Height, inches: 1.015 1.000 1.000

Cohesion: 156 psf
Friction Angle: 35 degrees

Deformation Rate, inch/minute: 0.0025 0.0023 0.0023
Normal Stress, psf: 1000 2000 3000
Peak Shear Stress, psf: 847 1623 2273
Shear Displacement, inches: 0.43 0.41 0.41

Direct Shear Test - ASTM D3080
**Sample: B-4**
Depth: 24.5 - 26.0 feet
Description: Dark gray clayey silt with a little fine sand

<table>
<thead>
<tr>
<th>Water Content, %</th>
<th>Initial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Density,pcf</td>
<td>57.8</td>
<td>71.2</td>
</tr>
<tr>
<td>Void Ratio</td>
<td>0.790</td>
<td>0.452</td>
</tr>
<tr>
<td>Degree of Saturation, %</td>
<td>149.5</td>
<td>100.0</td>
</tr>
</tbody>
</table>

| Sample Height, inches | 1.0000 | 0.8072 |

**Liquid Limit = N/A  Plasticity Index = N/A**

**CONSOLIDATION TEST - ASTM D2435**

---

**Sample: B-5**
Depth: 26.0 - 27.5 feet
Description: Dark gray silty clay with a little fine sand

<table>
<thead>
<tr>
<th>Water Content, %</th>
<th>Initial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Density,pcf</td>
<td>58.6</td>
<td>69.6</td>
</tr>
<tr>
<td>Void Ratio</td>
<td>2.026</td>
<td>1.546</td>
</tr>
<tr>
<td>Degree of Saturation, %</td>
<td>97.7</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liquid Limit = N/A  Plasticity Index = N/A</th>
</tr>
</thead>
</table>

| Sample Height, inches | 1.0000 | 0.8376 |

---

**CONSOLIDATION TEST - ASTM D2435**
Sample: B-6
Depth: 26.0 - 27.5 feet
Description: Gray clayey silt with a little fine gravel

<table>
<thead>
<tr>
<th>Property</th>
<th>Initial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Content, %</td>
<td>56.3</td>
<td>44.5</td>
</tr>
<tr>
<td>Dry Density,pcf</td>
<td>67.8</td>
<td>79.9</td>
</tr>
<tr>
<td>Void Ratio</td>
<td>1.740</td>
<td>1.323</td>
</tr>
<tr>
<td>Degree of Saturation, %</td>
<td>96.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Sample Height, inches</td>
<td>1.0000</td>
<td>0.8404</td>
</tr>
</tbody>
</table>

Liquid Limit = N/A
Plasticity Index = N/A

Sample: Bulk-1
Depth: 0.0 - 5.0 feet
Description: Brownish gray sandy gravel with a little silt

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molding Dry Density (pcf)</td>
<td>97.9</td>
</tr>
<tr>
<td>Molding Moisture (%)</td>
<td>26.0</td>
</tr>
<tr>
<td>Days Soaked</td>
<td>5</td>
</tr>
<tr>
<td>Aggregate</td>
<td>3/4 inch minus</td>
</tr>
<tr>
<td>Corr. CBR @ 0.1&quot;</td>
<td>42.4</td>
</tr>
<tr>
<td>Corr. CBR @ 0.2&quot;</td>
<td>33.0</td>
</tr>
<tr>
<td>Swell (%)</td>
<td>0.94</td>
</tr>
<tr>
<td>Hammer Wt. (lbs)</td>
<td>10</td>
</tr>
<tr>
<td>Hammer Drop (inches)</td>
<td>18</td>
</tr>
<tr>
<td>No. of Blows</td>
<td>56</td>
</tr>
<tr>
<td>No. of Layers</td>
<td>5</td>
</tr>
</tbody>
</table>
Sample: Bulk-2
Depth: 0.0 - 5.0 feet
Description: Brownish gray sandy gravel with a little silt

TEST RESULTS
Maximum Dry Density: 101.0 pcf
Optimum Moisture Content: 22.0 %
Test Date: October 17, 2019

<table>
<thead>
<tr>
<th>Sample</th>
<th>Depth</th>
<th>Description</th>
<th>Optimum Moisture Content</th>
<th>Maximum Dry Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk-2</td>
<td>0.0 - 5.0 feet</td>
<td>Brownish gray sandy gravel with a little silt</td>
<td>22.0 %</td>
<td>101.0 pcf</td>
</tr>
</tbody>
</table>

Molding Dry Density (pcf) 99.4
Hammer Wt. (lbs) 10
Hammer Drop (inches) 18
Days Soaked 4
No. of Blows 56
Aggregate 3/4 inch minus
No. of Layers 5

Sample: Bulk-1
Depth: 0.0 - 5.0 feet
Description: Brown silty clay with some sand

TEST RESULTS
Maximum Dry Density: 101.0 pcf
Optimum Moisture Content: 22.0 %
Test Date: October 17, 2019

<table>
<thead>
<tr>
<th>Sample</th>
<th>Depth</th>
<th>Description</th>
<th>Optimum Moisture Content</th>
<th>Maximum Dry Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk-1</td>
<td>0.0 - 5.0 feet</td>
<td>Brown silty clay with some sand</td>
<td>22.0 %</td>
<td>101.0 pcf</td>
</tr>
</tbody>
</table>

Molding Dry Density (pcf) 99.4
Hammer Wt. (lbs) 10
Hammer Drop (inches) 18
Days Soaked 4
No. of Blows 56
Aggregate 3/4 inch minus
No. of Layers 5
Sample: Bulk-2
Depth: 0.0 - 5.0 feet
Description: Brown silty clay with some sand

TEST RESULTS
Maximum Dry Density: 104.0 pcf
Optimum Moisture Content: 23.0%
Test Date: October 18, 2019

Sample | Depth (feet) | Soil Description | Initial Dry Density (pcf) | Moisture Contents | Expansion Index | Potential Expansion |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk-1</td>
<td>0.0 - 5.0</td>
<td>Brownish gray sandy gravel with a little silt</td>
<td>83.2</td>
<td>19.8  42.1</td>
<td>52</td>
<td>24</td>
</tr>
<tr>
<td>Bulk-2</td>
<td>0.0 - 5.0</td>
<td>Brown silty clay with some sand</td>
<td>81.8</td>
<td>20.6  41.9</td>
<td>52</td>
<td>119</td>
</tr>
</tbody>
</table>

Classification of Expansive Soil (ASTM D4529)

<table>
<thead>
<tr>
<th>Expansion Index</th>
<th>Potential Expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 20</td>
<td>Very Low</td>
</tr>
<tr>
<td>21 - 50</td>
<td>Low</td>
</tr>
<tr>
<td>51 - 90</td>
<td>Medium</td>
</tr>
<tr>
<td>91 - 130</td>
<td>High</td>
</tr>
<tr>
<td>Above 130</td>
<td>Very High</td>
</tr>
</tbody>
</table>

SUMMARY OF EXPANSION INDEX OF SOILS
<table>
<thead>
<tr>
<th>Location</th>
<th>Depth (feet)</th>
<th>pH Value</th>
<th>Minimum Resistivity (ohm-cm)</th>
<th>Chloride Content (mg/kg)</th>
<th>Sulfate Content (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1</td>
<td>5.0 - 6.5</td>
<td>7.28°</td>
<td>450°</td>
<td>67</td>
<td>15</td>
</tr>
<tr>
<td>B-2</td>
<td>10.0 - 11.5</td>
<td>8.32°</td>
<td>700°</td>
<td>34</td>
<td>22</td>
</tr>
<tr>
<td>B-4</td>
<td>9.5 - 11.5</td>
<td>7.88°</td>
<td>590°</td>
<td>220</td>
<td>120</td>
</tr>
</tbody>
</table>

**SUMMARY OF CORROSIVITY TESTS**

**TEST METHODS (by TestAmerica Laboratories, Inc.)**
- pH Value: Method 9045C
- Minimum Resistivity: SM 2510B
- Chloride Content: EPA 300.0
- Sulfate Content: EPA 300.0

**TEST METHODS (by Geolabs, Inc.)*
- pH Value: ASTM G51
- Minimum Resistivity: ASTM G57
- Chloride Content: N/A
- Sulfate Content: N/A

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**APPENDIX C**
ALOHA STADIUM PLANNING FOR NEW STADIUM & SITE REDEVELOPMENT
HALAWA, OAHU, HAWAII

GEOLABS, INC.
Hawaii • California

PLATE 1

ALOHA STADIUM PLANNING FOR NEW STADIUM & SITE REDEVELOPMENT
HALAWA, OAHU, HAWAII

GEOLABS, INC.
Hawaii • California

PLATE 2
ALOHA STADIUM PLANNING FOR NEW STADIUM & SITE REDEVELOPMENT
HALAWA, OAHU, HAWAII

GEOLABS, INC.
Hawaii • California

PLATE C3

100.0' TO 125.0'
57.5' TO 151.0'

PLATE C4

W.O. 7963:00
Appendix C:
Natural Resources Assessment - NASED
Natural resources assessment for the Aloha Stadium site (TMKs 9-9-003: 055, 061, 069, 070, & 071) Halawa, Honolulu District, Island of O‘ahu

December 27, 2019   DRAFT   AECOS No. 1610

Eric B. Guinther and Bryson Luke
AECOS Inc.
Kamehameha Highway, Kane‘ohe, Hawai‘i 96744
Phone: (808) 234-7770  Fax: (808) 234-7775  Email: guinther@aecos.com

Introduction

Considerations and conceptual planning are underway for the Aloha Stadium site in Halawa, south O‘ahu (WOC 2019). The stadium property (TMK: 9-9-003: 061 & 069) and three near by parcels (TMK: 9-9-003: 055, 070, & 071) are intended to be incorporated into future plans for the construction of a new stadium facility and ancillary development to create an Aloha Stadium Entertainment District. The site is the grounds of the existing Aloha Stadium, which lies on the east side of Kamehameha Highway, south of H-201, and west of H-1. The site is bounded and bisected by Salt Lake Blvd. Halawa Stream cuts across a portion of the site (Figure 1).

This report presents results of a natural resources survey (flora and fauna) of the site requested by Wilson Okamoto Corp. for inclusion into a draft Environmental Impact Statement (DEIS) that firm is preparing for the Aloha Stadium Authority (WOC 2019).

General Site Description

The existing Aloha Stadium first opened in 1975. It is located on mostly level to gently sloping ground of approximately 98 ac (40 ha). The stadium facility itself and open parking lots occupy nearly all of the land (Figures 2 and 3). Parcels being considered in the planning process extend southwest along Kamehameha Highway and include the site of a Honolulu Authority for Rapid Transportation (HART) station (Figure 4).

Figure 1. Halawa, Honolulu showing f the survey areas (outlined in red) for the Aloha Stadium project.
Figure 2. Southeast face of the Aloha Stadium and surrounding parking lot.

Figure 3. Front entrance to Aloha Stadium showing areas of landscape plantings.

Figure 4. HART viaduct and station site under construction.

Figure 5. Hālawa Stream channel passing through the Aloha Stadium parking lot.
Hālawa Stream crosses the southeastern part of the stadium parking lot, where the stream is completely confined within a concrete channel below the general site elevation (Figure 5, above). Downstream of the stadium parcel and Salt Lake Blvd, Hālawa Stream turns westward before discharging into East Loch, Pearl Harbor.

Methods

Plant Survey

A survey area map was loaded on a Trimble 6000 Series GNSS unit (Trimble GeoXH) for use during the botanical survey conducted by Eric Guinther on December 2, 2019. The GNSS unit recorded the progress track of the botanist providing real time feedback on location and adequacy of coverage during a wandering (pedestrian) transect. Because all of the area is developed, and most is a paved parking lot, the pedestrian survey concentrated on areas of landscape plantings and less maintained bordering areas.


Bird and Mammal Survey

Bryson Lake conducted the birds and mammals survey during the morning of December 2, 2019. Five, roughly equidistant, avian point-count stations were established within the survey area: Sta. 1 - Hālawa Stream at Salt Lake Blvd; Sta. 2 - Hālawa Stream near H-1; Sta. 3 - north side of Stadium near H-201 pedestrian overpass; Sta. 4 - Salt Lake Blvd. near HART station; and Sta. 5 - Kam Shopping Center lot entrance. A single eight-minute avian point-count was made at each station. The avian counts were conducted in the morning hours between 0750 and 0850 with the aid of Leica 8 X 42 binoculars and by listening for vocalizations. A 30-min waterbird count was made at Hālawa Stream. Weather conditions were ideal, with unlimited visibility and winds between calm and 10 miles-per-hour; cloud cover between 80 and 100% with occasional, very light rainfall. Avian phylogenetic order and nomenclature used in this report follows the AOS Check-List of North and Middle American Birds 2018 and the Sixtieth Supplement to the American Ornithological Society's Check-List of North American Birds (Chesser et al., 2018, 2019).

Results

Vegetation

Vegetation across the developed site comprises landscape plantings and scattered weedy growth (Figs 2 and 3). Multiple concentric rings surrounding the stadium (conspicuous in the Fig. 1, satellite image) define paved parking between islands populated by lawn and monkeypod trees (Albizia samoan). The area of the rings slopes gently upwards to the stadium structure, which is set down into a bowl. A majority of the ornamental plantings surround this latter area just outside the stadium structure itself. Other areas of ornamental plantings are scattered about the large parking lot. Natural and in places weedy growth with or without trees occur within the Hālawa Stream channel and around the perimeter of the stadium property. The nearby lots are mostly developed (HART facilities, except for TMR: 9-9-003: 055, which is disturbed grassland bordered by residential lots on Onehaha Loop.

Flora

Table 1 is a listing of all the species of flowering plants observed during the survey of the Stadium site and adjacent parcels. A total of 95 taxa were identified from the survey area. Only two (2%) native species were found: *milo* (Thespesia populnea) and *‘haloa* (Waltheria indica). Another three species (3%) are thought to be early Polynesian introductions (“canoe plants”): *ki‘oi* or *ti* (Cordyline fruticos), *‘uala* or sweet potato (Ipomoea batatas), and ‘*hi‘ai* or yellow wood sorrel (Oxalis corniculata). All of these plants are very common in the Islands. The total number of ornamental species (ornamentals plus naturalized, indigenous, or Polynesian species planted as landscape plants) is 39 (41% of the recorded species).

Avian Survey

Results of the avian station-counts are shown in Table 2. A total of 28 species of birds was recorded at the count-stations or observed incidentally during the survey. Several different wading birds were observed within the stream.
### Table 1. Aloha Stadium plant survey listing.

<table>
<thead>
<tr>
<th>Species listed by family</th>
<th>Common name</th>
<th>Status</th>
<th>Abundance</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GYMNOSPERMS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Araucariaceae</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Araucaria columnaris</em> (G. Forst.) J.D. Hook.</td>
<td>Cook-pine</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Podocarpaceae</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Podocarpus sp.</em></td>
<td>podo-carpus</td>
<td>Orn</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><strong>ACANTHACEAE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Asystasia gangetica</em> (L.) T. Anderson</td>
<td>Chinese violet</td>
<td>Nat</td>
<td>U</td>
<td></td>
</tr>
<tr>
<td><em>Barleria repens</em> C. Nees</td>
<td>pink-ruellia</td>
<td>Nat</td>
<td>Uc</td>
<td></td>
</tr>
<tr>
<td><strong>AMARANTHACEAE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Alternanthera pungens</em> Kunth</td>
<td>khaki weed</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Amaranthus spinosus</em> L.</td>
<td>spiny amaranth</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Amaranthus viridis</em> L.</td>
<td>slender amaranth</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><strong>ASTERACEAE (COMPOSITAE)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Calyptocarpus viridis</em> Less.</td>
<td>---</td>
<td>Nat</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td><em>Emilia fosbergii</em> Nicolson</td>
<td>Floris’s paintbrush, pualele</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Sparganitoca triflora (L.) Pruski</td>
<td>we'della</td>
<td>Nat</td>
<td>Oc</td>
<td></td>
</tr>
<tr>
<td>Tridax procumbens L.</td>
<td>coat buttons</td>
<td>Nat</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td><strong>BIGNONIACEAE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Spathodea campanulata</em> P. Beauv.</td>
<td>African tulip tree</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Tabebuia donnell-smithi</em> Rose</td>
<td>gold tree</td>
<td>Orn</td>
<td>Uu</td>
<td></td>
</tr>
<tr>
<td><strong>BORAGINACEAE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Calonia retusa</em> (Vahl) Masamune</td>
<td>Fukien-tea</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Cordia sebestena</em> L.</td>
<td>geiger tree</td>
<td>Orn</td>
<td>U</td>
<td></td>
</tr>
<tr>
<td><strong>CONVOLVULACEAE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Ipomoea batatas</em> (L.) Lam.</td>
<td>‘uala</td>
<td>Pol</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Ipomoea obscura</em> (L.) Ker-Gawl</td>
<td>---</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Ipomoea triflora</em> L.</td>
<td>little bell</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><strong>CUCURBITACEAE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Coccinia grandis</em> (L.) Voigt</td>
<td>scarlet-fruitd gourd</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><strong>EUPHORBIEACAE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Codiaeum variegatum</em> (L.) Blume</td>
<td>croton</td>
<td>Orn</td>
<td>U</td>
<td></td>
</tr>
<tr>
<td><em>Euphorbia hypericifolia</em> L.</td>
<td>graceful spurge</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
</tbody>
</table>

### Table 1 (continued).

<table>
<thead>
<tr>
<th>Species listed by family</th>
<th>Common name</th>
<th>Status</th>
<th>Abundance</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EUPHORBIACEAE (cont.)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Euphorbia hirta</em> L.</td>
<td>garden spurge</td>
<td>Nat</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td><em>Euphorbia prostrata</em> Aiton</td>
<td>prostrate spurge</td>
<td>Nat</td>
<td>U</td>
<td></td>
</tr>
<tr>
<td><em>Eichinops communis</em> L.</td>
<td>castor bean</td>
<td>Nat</td>
<td>Uo</td>
<td>&lt;1&gt;</td>
</tr>
<tr>
<td><strong>PAPACEAE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Albizia lebebeck</em> (L.) Benth.</td>
<td>siris tree</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Albizia saman</em> (Jacq.) F. Muell.</td>
<td>monkeypod, rain tree</td>
<td>Nat</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td><em>Alysicarpus vaginalis</em> (L.) DC</td>
<td>alicy clover</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Chamaecrista nictitans</em> (L.) Moench</td>
<td>shower tree</td>
<td>Orn</td>
<td>R</td>
<td>&lt;2&gt;</td>
</tr>
<tr>
<td><em>Crotalaria incana</em> L.</td>
<td>partridge pea</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Desmanthus perambucanus</em> (L.) Thellung</td>
<td>fuzzy rattlepod</td>
<td>Nat</td>
<td>R</td>
<td>&lt;2&gt;</td>
</tr>
<tr>
<td><em>Indigofera wightii</em> (Wight &amp; Arnott) Lackey</td>
<td>virgate mimosa</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Leucaena leucocephala</em> (Lam.) deWit</td>
<td>hyacinth bean</td>
<td>Nat</td>
<td>R</td>
<td>&lt;1.2&gt;</td>
</tr>
<tr>
<td><em>Macroptilium atropurpureum</em> (DC) Urb.</td>
<td>koa haole</td>
<td>Nat</td>
<td>U</td>
<td></td>
</tr>
<tr>
<td><em>Neonotonia</em> sp.</td>
<td>glycinie vine</td>
<td>Nat</td>
<td>R</td>
<td>&lt;1.2&gt;</td>
</tr>
<tr>
<td><em>Pithecellobium dulce</em> (Roxb.) Benth.</td>
<td>'opiuma</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Prosopis pallida</em> (Humb. &amp; Bonpl. ex Willd.) Kunth</td>
<td>kiawe</td>
<td>Nat</td>
<td>U</td>
<td></td>
</tr>
<tr>
<td><em>Senna surattensis</em> (N.L. Burm.) H. Irwin &amp; Barneby</td>
<td>scrambled egg plant</td>
<td>Nat</td>
<td>U</td>
<td></td>
</tr>
<tr>
<td><strong>LYTHRACEAE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Lagerstomia sp.</em></td>
<td>crepe myrtle</td>
<td>Orn</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><strong>MALVACEAE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Hibiscus rosa-sinensis</em> L.</td>
<td>Chinese hibiscus cult</td>
<td>Orn</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td><em>Malvastrum coromandelianum</em> (L.) Garcke</td>
<td>false mallow</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Sida ciliaris</em> L.</td>
<td>---</td>
<td>Nat</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td><em>Sida rhombifolia</em> L.</td>
<td>---</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Sida spinosa</em> L.</td>
<td>prickly sida</td>
<td>Nat</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td><em>Thespesia populnea</em> (L.) Sol. ex Corrêa</td>
<td>milo</td>
<td>Ind</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td><em>Waltheria indica</em> L.</td>
<td>'uhala</td>
<td>Ind</td>
<td>U</td>
<td></td>
</tr>
</tbody>
</table>
### Natural Resources Surveys

#### Table 1 (continued).

<table>
<thead>
<tr>
<th>Family</th>
<th>Common name</th>
<th>Status</th>
<th>Abundance</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MORACEAE</strong></td>
<td><strong>Ficus microcarpa</strong> f.</td>
<td>Chinese banyan</td>
<td>Nat</td>
<td>R</td>
</tr>
<tr>
<td><strong>MORINGACEAE</strong></td>
<td><strong>Moringa oleifera</strong> Lam.</td>
<td>horseradish tree, malunggay</td>
<td>Nat</td>
<td>R</td>
</tr>
<tr>
<td><strong>MYRTACEAE</strong></td>
<td><strong>Eucalyptus citriodora</strong> Hook.</td>
<td>lemon gum</td>
<td>Nat</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td><strong>Passion fruit</strong></td>
<td>common guava</td>
<td>Nat</td>
<td>R</td>
</tr>
<tr>
<td><strong>NYCTAGINACEAE</strong></td>
<td><strong>Boerhavia coccinea</strong> Mill.</td>
<td>false alena</td>
<td>Nat</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td><strong>Bougainvillea</strong> cf. spectabilis** Wild.</td>
<td>bougainvillea</td>
<td>Orn</td>
<td>O</td>
</tr>
<tr>
<td><strong>OXALIDACEAE</strong></td>
<td><strong>Oxalis corniculata</strong> L.</td>
<td>'hi'i</td>
<td>Pol</td>
<td>U</td>
</tr>
<tr>
<td><strong>PORTULACEAE</strong></td>
<td><strong>Portulaca pilosa</strong> L.</td>
<td>---</td>
<td>Nat</td>
<td>R</td>
</tr>
<tr>
<td><strong>RUPIACEAE</strong></td>
<td><strong>Hedyotis corymbosa</strong> (L.) Lam.</td>
<td>---</td>
<td>Nat</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td><strong>Spermacoce asurgens</strong> Ruiz &amp; Pav.</td>
<td>buttonweed</td>
<td>Nat</td>
<td>R</td>
</tr>
<tr>
<td><strong>SAPINDACEAE</strong></td>
<td><strong>Harpapilia pendula</strong> F. Muell.</td>
<td>tulipwood</td>
<td>Orn</td>
<td>U</td>
</tr>
<tr>
<td><strong>Solanaceae</strong></td>
<td><strong>Solanum torvum</strong> Sw.</td>
<td>---</td>
<td>Nat</td>
<td>R &lt;2</td>
</tr>
<tr>
<td><strong>VERBENACEAE</strong></td>
<td><strong>Duranta erecta</strong> L.</td>
<td>golden dewdrop</td>
<td>Orn</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td><strong>Lantana camara</strong> L.</td>
<td>lantana cult.</td>
<td>Orn</td>
<td>Uu</td>
</tr>
<tr>
<td><strong>FLOWERING PLANTS</strong></td>
<td><strong>MONOCOTYLEDONES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AGAVACEAE</strong></td>
<td><strong>Cordyline fruticosa</strong> (L.) A. Chev.</td>
<td>kī</td>
<td>Pol</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><strong>Cordyline fruticosa</strong> (L.) A. Chev.</td>
<td>ti cultvar</td>
<td>Orn</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><strong>Dracaena fragrans</strong> (L.) Ker Gawl.</td>
<td>fragrant dracaena</td>
<td>Orn</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td><strong>Dracaena marginata</strong> Lam.</td>
<td>money tree</td>
<td>Orn</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td><strong>Dracaena sanderiana</strong> M.T. Masters</td>
<td>sanderriana</td>
<td>Orn</td>
<td>R</td>
</tr>
<tr>
<td><strong>ARECACEAE</strong></td>
<td><strong>Cocos nucifera</strong> L.</td>
<td>coconut palm</td>
<td>Nat</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><strong>Dypsis lutescens</strong> (H. Wendel.) Beentje &amp; J. Dransfield</td>
<td>areca palm</td>
<td>Orn</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><strong>Roystonea regia</strong> (Kunth) O.F. Cook</td>
<td>Royal palm</td>
<td>Orn</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td><strong>Veitchia milleri</strong> (Beccari) H. E. Moore</td>
<td>Manila palm</td>
<td>Orn</td>
<td>O</td>
</tr>
<tr>
<td><strong>GYPERACEAE</strong></td>
<td><strong>Cyperus gracilis</strong> R. Br.</td>
<td>McCoy grass</td>
<td>Nat</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><strong>Cyperus involucratus</strong> Rothr.</td>
<td>umbrella sedge</td>
<td>Nat</td>
<td>U &lt;1</td>
</tr>
<tr>
<td></td>
<td><strong>Cyperus rotundus</strong> L.</td>
<td>nut grass</td>
<td>Nat</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td><strong>Kyllinga brevifolia</strong> Rothr.</td>
<td>kill'o'opu</td>
<td>Nat</td>
<td>U</td>
</tr>
<tr>
<td><strong>LILIACEAE</strong></td>
<td><strong>Hymenocallis</strong> sp.</td>
<td>spider lily</td>
<td>Nat</td>
<td>R &lt;2</td>
</tr>
<tr>
<td><strong>POACEAE</strong></td>
<td><strong>Axonopus compressus</strong> (Swartz) P. Beauv.</td>
<td>brd-lvd. carpetgrass</td>
<td>Orn</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><strong>Bothriochloa</strong> pertusa (L.) A. Camus</td>
<td>pitted beardgrass</td>
<td>Nat</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td><strong>Cenchrus ciliaris</strong> L.</td>
<td>buffelgrass</td>
<td>Nat</td>
<td>Uc</td>
</tr>
<tr>
<td></td>
<td><strong>Cenchrus echinatus</strong> L.</td>
<td>common sand bur</td>
<td>Nat</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><strong>Chloris barbata</strong> (L.) Sw.</td>
<td>swollen fingergrass</td>
<td>Nat</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td><strong>Chloris virgata</strong> Sw.</td>
<td>feather fingergrass</td>
<td>Nat</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><strong>Cynodon dactylon</strong> (L.) Pers.</td>
<td>Bermuda grass</td>
<td>Nat</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td><strong>Cynodon x magennis</strong> Hurcombe</td>
<td>hybrid Bermuda</td>
<td>Orn</td>
<td>Oa</td>
</tr>
<tr>
<td></td>
<td><strong>Dactylolomium</strong> estigmaticum (L.) Wild.</td>
<td>beach wiregrass</td>
<td>Nat</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td><strong>Dichanthium</strong> aristatum (Poir.) Hubb.</td>
<td>Wilder grass</td>
<td>Nat</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td><strong>Eleusine indica</strong> (L.) Gaertn.</td>
<td>wiregrass</td>
<td>Nat</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td><strong>Eragrostis amabilis</strong> (L.) Wight &amp; Arnott</td>
<td>Japanese lovegrass</td>
<td>Nat</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td><strong>Eragrostis pectinacea</strong> (Michx.) Nees</td>
<td>Carolina lovegrass</td>
<td>Nat</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td><strong>Megathysus maximus</strong> (Jacq.) B.K. Simon &amp; W.L. Jacob</td>
<td>Guinea grass</td>
<td>Nat</td>
<td>C &lt;1</td>
</tr>
<tr>
<td></td>
<td><strong>Melinus repens</strong> (Wild.) Zizka</td>
<td>Natal redtop</td>
<td>Nat</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td><strong>Sporobolus elongatus</strong> R. Br.</td>
<td>bristly foxtail</td>
<td>Nat</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><strong>Urochloa mutica</strong> (Forssk.) T.Q. Nguyen</td>
<td>stuntgrass</td>
<td>Nat</td>
<td>U</td>
</tr>
<tr>
<td></td>
<td><strong>Urochloa distachya</strong> (L.) T.W. Nguyen</td>
<td>California grass</td>
<td>Nat</td>
<td>A &lt;1</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>---</td>
<td>Nat</td>
<td>Oa</td>
</tr>
<tr>
<td></td>
<td><strong>Zoysia matrella</strong> var. pacifica</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td><strong>Goudswaard</strong></td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Common name</td>
<td>Status</td>
<td>Abundance</td>
<td>Notes</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>STRELITZIACEAE</td>
<td>bird-of-paradise</td>
<td>Orn</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>ZINGIBERACEAE</td>
<td>red ginger</td>
<td>Orn</td>
<td>U</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2. Avian species detected on December 2, 2019 survey of the Aloha Stadium site.**

<table>
<thead>
<tr>
<th>ORDER</th>
<th>FAMILY</th>
<th>Species</th>
<th>Common Name</th>
<th>Status</th>
<th>Total Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSERIFORMES</td>
<td>NATIDAE</td>
<td><em>Anas wyvilliana</em> x <em>A. platyrhynchos</em></td>
<td>Hawaiian Duck x Mallard hybrid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COLUMBIFORMES</td>
<td>PHASIANIDAE</td>
<td><em>Gallus gallus</em></td>
<td>Domestic Chicken</td>
<td></td>
<td>6 / 1.2</td>
</tr>
<tr>
<td>COLUMBIFORMES</td>
<td>COLUMBIDAE</td>
<td><em>Columba livia</em></td>
<td>Rock Pigeon</td>
<td></td>
<td>9 / 1.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Streptopelia chinensis</em></td>
<td>Spotted Dove</td>
<td></td>
<td>21 / 4.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Geopelia striata</em></td>
<td>Zebra Dove</td>
<td></td>
<td>43 / 8.6</td>
</tr>
<tr>
<td>CHARADRIIFORMES</td>
<td>RECURVIROSTRIDAE</td>
<td><em>Himantopus mexicanus knudseni</em></td>
<td>Hawaiian Black-necked Stilt, <em>ae'o</em></td>
<td></td>
<td>1†</td>
</tr>
<tr>
<td>CHARADRIIDAE</td>
<td><em>Pluvialis fulva</em></td>
<td>Pacific Golden-Plover, <em>kōlea</em></td>
<td></td>
<td>IM / 3.0</td>
<td></td>
</tr>
<tr>
<td>SHELDUCKS</td>
<td><em>Scolopacidae</em></td>
<td><em>Arenaria interpres</em></td>
<td>Ruddy Turnstone, <em>ʻokeheke</em></td>
<td></td>
<td>IM / 4†</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Tringa incana</em></td>
<td>Wandering Tattler, <em>ʻūlī</em></td>
<td></td>
<td>IM / 1†</td>
</tr>
<tr>
<td>LARIDAE</td>
<td><em>Gygis alba</em></td>
<td>White Tern, <em>manu o Kū</em></td>
<td></td>
<td>I / -</td>
<td></td>
</tr>
<tr>
<td>PELECANIFORMES</td>
<td>ARIIDAE</td>
<td><em>Bubulcus ibis</em></td>
<td>Cattle Egret</td>
<td></td>
<td>11 / 2.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Nycticorax nycticorax</em></td>
<td>Black-crowned Night-Heron, <em>ʻaukuʻu</em></td>
<td></td>
<td>I / 1†</td>
</tr>
<tr>
<td>PSITTIIFORMES</td>
<td>PSITTACIDAE</td>
<td><em>Psittacula krameri</em></td>
<td>Rose-ringed Parakeet</td>
<td></td>
<td>2 / 0.4</td>
</tr>
<tr>
<td>PASSERIFORMES</td>
<td><em>Pycnonotidae</em></td>
<td><em>Pycnomonas cafer</em></td>
<td>Red-vented Bulbul</td>
<td></td>
<td>27 / 5.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Pycnomonas jocosus</em></td>
<td>Red-whiskered Bulbul</td>
<td></td>
<td>2 / 0.4</td>
</tr>
</tbody>
</table>

---

**Key to Table 1.**

**STATUS = distributional status for the Hawaiian Islands:**
- **Ind =** indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
- **Nrt =** naturalized, exotic plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.
- **Orn =** a cultivated plant; a species not thought to be naturalized (spreading on its own) in Hawaii.
- **Poi =** an early Polynesian introduction. Introduced before 1778.

**ABUNDANCE = occurrence ratings for plant species:**
- **R = Rare** seen in only one or perhaps two locations.
- **U = Uncommon** seen at most in several locations
- **O = Occasional** seen with some regularity
- **C = Common** observed numerous times during the survey
- **A = Abundant** found in large numbers; may be locally dominant.
- **AA = Very abundant** a dominant, vegetation-defining species.

Lower case letters (u, c, a) following qualitative rating of abundance indicate localized abundance is greater than occurrence rating. For example, Ra would be a plant encountered only once or twice, but very numerous where encountered.

---

**NOTES:***
- **<1** - Observed in Hālawa Stream channel and vegetated bank.
- **<2** - Plant lacking key diagnostic characteristics (flower, fruit); identification therefore, uncertain.

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channel: koloo x mallard duck (*Anas wyvilliana* x *A. platyrhynchos* cross), *ʻaeʻo* (*Himantopus mexicanus knudseni*), ʻokeheke (*Arenaria interpres*), and ʻūlī (*Tringa incana*) are attracted to open water areas in the stream. The water-obligate bird survey recorded only three *koloo* x mallard duck hybrids.

**Mammalian Surveys**

We recorded dog (*Canis familiaris*; heard barking from neighboring properties). Several small Indian mongooses (*Herpestes javanicus*) were seen in and around a green waste dump on site. No other mammals were recorded, though it is probable that one or more of the four alien Muridae species currently established on the Island of Oʻahu—the roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), Polynesian rat (*Rattus**
Table 2 (continued).

<table>
<thead>
<tr>
<th>ORDER</th>
<th>FAMILY</th>
<th>Species</th>
<th>Common Name</th>
<th>Status</th>
<th>Total Count / RA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zosterops japonicus</td>
<td>Zosterops japonicus</td>
<td>Japanese White-eye</td>
<td>NN</td>
<td>31 / 6.2</td>
<td></td>
</tr>
<tr>
<td>Leiothrix lutea</td>
<td>Leiothrix lutea</td>
<td>Red-billed Leiothrix</td>
<td>NN</td>
<td>3 / 0.6</td>
<td></td>
</tr>
<tr>
<td>Copsychus malabaricus</td>
<td>Copsychus malabaricus</td>
<td>White-rumped Shama</td>
<td>NN</td>
<td>1†</td>
<td></td>
</tr>
<tr>
<td>Acridotheres tristis</td>
<td>Acridotheres tristis</td>
<td>Common Myna</td>
<td>NN</td>
<td>75 / 15</td>
<td></td>
</tr>
<tr>
<td>Northern Cardinal</td>
<td>Northern Cardinal</td>
<td>Northern Cardinal</td>
<td>NN</td>
<td>2 / 0.4</td>
<td></td>
</tr>
<tr>
<td>Red-crested Cardinal</td>
<td>Prenoaria coronata</td>
<td>Red-crested Cardinal</td>
<td>NN</td>
<td>12 / 2.4</td>
<td></td>
</tr>
<tr>
<td>Saffron Finch</td>
<td>Stalis flavella</td>
<td>Saffron Finch</td>
<td>NN</td>
<td>2†</td>
<td></td>
</tr>
<tr>
<td>Yellow-fronted Canary</td>
<td>Critithagra mozambicus</td>
<td>Yellow-fronted Canary</td>
<td>NN</td>
<td>3†</td>
<td></td>
</tr>
<tr>
<td>House Sparrow</td>
<td>Passer domesticus</td>
<td>House Sparrow</td>
<td>NN</td>
<td>24 / 4.8</td>
<td></td>
</tr>
<tr>
<td>Common Waxbill</td>
<td>Estrilda astrild</td>
<td>Common Waxbill</td>
<td>NN</td>
<td>29 / 5.8</td>
<td></td>
</tr>
<tr>
<td>Java Sparrow</td>
<td>Lonchura oryzivora</td>
<td>Java Sparrow</td>
<td>NN</td>
<td>8 / 1.6</td>
<td></td>
</tr>
<tr>
<td>Scaly-breasted Munia</td>
<td>Lonchura punctulata</td>
<td>Scaly-breasted Munia</td>
<td>NN</td>
<td>1†</td>
<td></td>
</tr>
<tr>
<td>Chestnut Munia</td>
<td>Lonchura atricapilla</td>
<td>Chestnut Munia</td>
<td>NN</td>
<td>2 / 0.4</td>
<td></td>
</tr>
</tbody>
</table>

Status
- NN: Naturalized alien; introduced to the Hawaiian Islands by humans
- IM: Indigenous migrant; native, but not unique to the Hawaiian Islands and does not breed in the Islands
- RA: Relative Abundance - Number of birds detected divided by the number of point counts (5)

Key to table 2

- †: Incidental observation

Discussion

Botanical Resources

No plants of conservation concern or enjoying statutory protection (that is, listed as threatened or endangered; HDLNR, 1998; USFWS, 2015, nd) were noted in the survey. No trees listed by the City & County of Honolulu, Exceptional Tree Program occur on the subject parcels (C&C, 2017).

Hālawa Stream

Hālawa Stream arises from multiple branches draining the very crest of the Koʻolau mountain in an area unknown to most Oʻahu residents until the opening of the H-3 through the valley of North Hālawa Stream. A long, narrow valley to the east, opening on the south side of Red Hill, is drained by South Hālawa Stream. Their confluence is in the general vicinity of the highway interchange between Moanalua Freeway (H-201) and H-3. Downstream of the confluence, Hālawa Stream flows through the Aloha Stadium parking lot into an estuary that opens into East Loch of Pearl Harbor.

Hālawa Stream is classified by the Department of Land and Natural Resources, Division of Aquatic Resources (DAR) as a perennial stream (watershed code 34002) with a total stream length of 35.4 km or 22 mi (HDLNR-DAR, 2008). Seventy percent of Hālawa watershed is in conservation district and the lower thirty percent of the watershed is urban (HDLNR-DAR, 2008).

Where Hālawa Stream crosses the stadium parking lot, it is confined within a concrete-lined channel (see Fig. 5, above). Our flora survey included identifying plants growing within this channel and a water-obligate avian survey was conducted; however, no specific survey of the aquatic fauna was made for the reason that the stream is entirely confined by concrete sides and bottom and numerous previous surveys provide sufficient information on stream biota, both upstream and downstream of the stadium property. The most recent survey was made for repairs to the Salt Lake Blvd. bridge (AECOS, 2011b). Although the bridge is located just off the stadium property, that survey included the lower end of the channel within the stadium parking lot. The concrete bottom presumably ends a short distance downstream of the Salt Lake Blvd. bridge, although the terminus is buried under sediment (2011a).

Previous surveys of Hālawa Stream include: a habitat and biota survey as part of a statewide stream inventory (Timbol & Macielek, 1978); a survey in 1989 in preparation for maintenance dredging with bioassay/bioaccumulation testing.
of sediments collected in the project area (AECOS, 1989); in 1997 and 1998, the Hawai‘i Biological Survey looked at biodiversity of freshwater and estuarine communities in Lower Hālawa Stream as part of a larger study of introduced species in Pearl Harbor (Englund, et al., 2000); in 1999 and again in 2002, biological reconnaissance surveys were conducted in North Hālawa Stream for a Honolulu City & County base yard expansion project (AECOS, 1999a, 2002); in 1999, a biological reconnaissance survey was conducted in the estuary for a Kamehameha Highway bridge widening project (AECOS, 1999b); in 2000, a biological and habitat assessment was conducted for Hālawa Stream as part of a project to evaluate the health of streams in the “urban core” of metropolitan Honolulu (Kido, 2001); in 2007, the estuarine reach was examined for a wetlands inventory report (WCP & AECOS, 2007); in 2009, a biological reconnaissance and water quality survey was conducted in the channel between Kamehameha Highway and Salt Lake Boulevard (AECOS, 2009); in 2011 water quality monitoring was conducted for the Kamehameha Highway bridge project (AECOS, 2011a) and a survey of the stream was undertaken for planned improvements to Salt Lake Boulevard bridge (AECOS, 2011b). Most recently a brief reconnaissance of the estuary was made just upstream of the Kamehameha Highway bridge (AECOS, 2019). The US Geological Survey (USGS) maintains a gaging station on Hālawa Stream (USGS, 2009) and the Department of Land and Natural Resources, Division of Aquatic Resources (HDLNR-DAR) has conducted various studies and compiled their data in a Watershed Atlas covering biology samples collected in Hālawa Stream from 1961 through 2006 (HDLNR, 2008).

A listing of all the aquatic species encountered during previous surveys in Hālawa Stream and estuary is provided as Appendix A in AECOS (2011b). Many of the species on the comprehensive list are insects and other small or cryptic animals. Poor habitat diversity and shallow water (sheet flow over the concrete bed) limit the diversity of aquatic fauna expected to reside in the Stadium portion of the stream.

**Hālawa Estuary**

At the Kamehameha Highway bridge, Hālawa Stream is an estuary some 40 m (130 ft) across and subject to the tide. Red mangrove forms a grove or mangal that occupies most of the shoreline, with some pickelweed (Batis maritimus) covering the ground where mangroves are not present. The stream is incised some 10 m (30 ft) in natural in material, but likely represents fill. Tidal influence extends upstream to the concrete footings of the Salt Lake Boulevard bridge. Surface salinities near the Kamehameha Highway bridge range between 30 to 37 psu (seawater is 35-36 psu), whereas salinities near Salt Lake

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Boulevard range from 0 psu (freshwater) in the usually weak flowing channel to 26 to 32 psu a short distance into the estuary (Englund et al., 2000).

**Hālawa Stream Upstream**

Upstream of the Stadium, Hālawa Stream supports populations of native stream macrofauna (pers. observ.; Englund, et al., 2000; DLNR-DAR, 2009). Hawaiian endemic and indigenous freshwater fish and crustaceans have an amphidromous life cycle: eggs are laid in freshwater stream reaches, and hatched larvae drift downstream and out into the ocean where they develop for a time before migrating back into freshwater streams to grow to maturity (Ford and Kinzie, 1982; Kinzie, 1988). Consequently, while modifications to the stream segment through the Stadium property may not directly impact populations of these native aquatic animals, the stream must not be obstructed or structural barriers to migration constructed lest migrant animals be prevented from repopulating suitable habitats upstream. Maintaining good water quality in the local stream segment is also important.

**Hālawa Stream Water Quality**

Water quality measurements and samples for lower Hālawa Stream were collected downstream from the Salt Lake Boulevard bridge on 314 sampling events between January 2003 and February 2010 (AECOS, unpublished) as part of a construction monitoring program. Water temperatures and pH levels were generally in compliance with State of Hawai‘i water quality standards (HDOH, 2009). Dissolved Oxygen (DO) saturation was in compliance with the state criterion (80% saturation) about 60% of the time. Lower DO saturation may be associated with tidal fluxes in this upper estuarine reach of Hālawa Stream. The geometric means for turbidity and total suspended solids (TSS) exceeded both “wet” and “dry” season criteria. The relatively high particulate levels (turbidity and TSS) in the lower reach of Hālawa Stream likely result from erosion and surface runoff during episodic events, and tidal exchange with turbid water entering from Pearl Harbor.

Three water quality sampling stations were established for the Salt Lake Blvd. bridge project area and sampled on June 15, 2011. Sta. “Upstream” was located within the channel on the stadium site ( m upstream of the bridge). Sta. “Bridge” was located just downstream of the bridge off the right bank just downstream from end of the concrete streambed and Sta. “Downstream” another m downstream of the bridge downstream from the hardened channel where the streambed is natural. Results are shown in Table 3. Due to low water flow, sample locations were selected based on sufficient water level for filling sample bottles.
Water temperature was warmer at the Upstream and Bridge stations than the Downstream station. Conductivity was high at Sta. Downstream, evidence that this station is tidally influenced. The water was supersaturated with oxygen at each of the stations, the result of photosynthesis by algae in the water or growing on the bottom. Differences in pH were probably a function of this photosynthetic activity, and the slight salinity at Sta. Downstream. The highest pH (9.11 pH units) occurred along with the highest DO saturation (157%) at Sta. Upstream. Photosynthetic activity by algae results in an uptake of carbon dioxide (CO₂) from the water, raising the pH and increasing DO. Salinity was less than 1 ppt upstream from the bridge and at the bridge and 2 ppt at Sta. Downstream on June 15, 2011.

<table>
<thead>
<tr>
<th>Station</th>
<th>Time</th>
<th>Temp. (°C)</th>
<th>Conductivity (umhos/cm)</th>
<th>DO (mg/L)</th>
<th>DO sat. (%)</th>
<th>pH</th>
<th>Salinity (ppt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream</td>
<td>1035</td>
<td>29.5</td>
<td>596</td>
<td>11.90</td>
<td>157</td>
<td>9.11</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Bridge</td>
<td>1027</td>
<td>29.3</td>
<td>612</td>
<td>10.69</td>
<td>140</td>
<td>8.86</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Downstream</td>
<td>1015</td>
<td>26.5</td>
<td>3920</td>
<td>10.00</td>
<td>126</td>
<td>8.59</td>
<td>2</td>
</tr>
</tbody>
</table>

Particulate concentrations (turbidity and TSS) were low at each of the stations, (ranging from 3.0 to 3.6 NTU and 2.28 to 3.86 mg/L, respectively). TSS was highest at Sta. Upstream (3.6 NTU) and turbidity was highest at the Sta. Downstream (3.86 mg/L). Nitrogen concentrations (N₂O₃-N₂O₂ and TN) were elevated at all three stations, with the highest levels of each at Sta. Downstream. Total Phosphorus (TP) was low at all three stations.

Hālawa Stream is listed on the Hawai‘i Department of Health (HDOH) 2006 list of impaired waters in Hawai‘i, prepared under Clean Water Act §303d (HDOH, 2008). This listing indicates that the stream may not meet the Hawai‘i water quality standards for nitrate-nitrite (N₃+−N₂), total nitrogen (TN), total phosphorus (TP), turbidity, and total suspended solids (TSS). A Total Maximum Daily Load (TMDL) for listed streams in the Pearl Harbor Watershed on O‘ahu is in progress (HDOH, 2018).

- Water quality impacts generated by construction will depend upon the extent to which the existing concrete channel is modified. Conceptual plans presented in WOC (2019) suggest that each of the alternatives under consideration incorporates the creation of a more natural stream passage through the Stadium site. Impacts can be minimized by employing effective best management practices (BMPs) and improved water quality for the proposed Entertainment District, the Hālawa estuary, and East Loch of Pearl Harbor would benefit in the long term from a more natural stream environment and riparian zone.

### Avian Resources

#### Seabirds

White Tern or *Manu o Kū* (*Gygis alba*) is a state-listed species on O‘ahu with a population centered across downtown Honolulu and east through Waikiki (VanderWerf, 2003; AECOS, 2016; VanderWerf and Downs, 2016). White Terns in Honolulu nest year round, but with a marked peak between January and April, with March having the greatest nesting activity. A species pair lays and tends one egg, not in a nest, but rather setting the egg in a tree limb crotch, depression, or other location where it will not easily be dislodged. The concentration of monkeypod trees surrounding the Stadium might provide suitable nesting habitat for this seabird, although none was recorded in our survey. White Terns nest during all months of the year, but most eggs are laid between January and April, and the peak of egg laying is in March (VanderWerf, 2003).

- Prior to removal or trimming, a tree should be inspected by a qualified biologist to determine if White Tern nesting or brooding activity is underway within the tree. If a pair of terns, an egg, or a chick is found, the tree (branch) should be left in place until the chicks fledge and the birds leave the tree, or the nesting attempt fails. HDLNR-DOFAW has developed protocols to be followed by arborists when trimming trees that may be used by white terns (VanderWerf, 2017; Liu et al., 2019).

It is also possible that the endangered Hawaiian Petrel (*Pterodroma sandwichensis*) and the threatened Newell’s Shearwater (*Puffinus newelli*) may overfly the Stadium site during their nesting season. These two species have recently been detected on the Island of O‘ahu (Young et al 2019). The primary cause of mortality in both Hawaiian Petrels and Newell’s Shearwaters is thought to be predation by alien mammalian species at the nesting colonies (USFWS,
1983; Simons and Hodges, 1998; Ainley et al., 2001). Collision with man-made structures is considered to be the second most significant cause of mortality of these seabird species in Hawai‘i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds can collide with man-made structures, and if they are not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Hadley, 1961; Teller, 1979; Sincock, 1981; Reed et al., 1985; Teller et al., 1987; Cooper and Day, 1998; Podobsky et al., 1998; Ainley et al., 2001; Hue et al., 2001; Day et al., 2003). Additionally, Wedge-tailed Shearwaters (Ardenna pacifica), a coastal nesting indigenous seabird, could also overfly the site on a seasonal basis. No suitable nesting habitat for any of these three seabird species occurs on the Stadium site.

- It is recommended that the all lights installed or set-up as part of the construction be shielded to reduce the potential for interactions of nocturnally flying seabirds with external lights and other man-made structures (Reed et al., 1985; Telfer et al., 1987).

**Owls**

There are two resident owl species on O‘ahu: the introduced Barn Owl (*Tyto alba*) and the endemic sub-species of the Short-eared Owl (*Asio flammeus sandwichensis*) or *pue‘o*. This latter species has become increasingly scarce on O‘ahu, and the O‘ahu population is listed as endangered by the State of Hawai‘i (not listed under federal statute). No suitable habitat for this species to forage or nest occurs on the Stadium site.

**Mammalian Resources**

**Hawaiian Hoary Bat**

It is possible that Hawaiian hoary bat overfly the project area on a seasonal basis. The principal potential impact that redevelopment of the Stadium site poses to bats is during clearing and grubbing when vegetation is removed. Removal of trees within the project site may temporarily displace individual bats using a tree as a roosting location. However, this species of bat uses multiple roosts within a home territory, so the disturbance associated with removal of vegetation would be minimal. An exception might be during pupping season because females carrying pups may be less able to rapidly vacate a roost as a tree is removed. Further, adult female bats sometimes leave their pups in the roost tree when they forage. Very small pups may be unable to flee a tree that is being felled. Potential adverse effects from such disturbance can be avoided or minimized by not clearing woody vegetation taller than 4.6 m (15 ft) between June 1 and September 15, the bat pupping season.

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To avoid potential deleterious impacts to roosting bats it is recommended that no woody vegetation taller than 4.6 m (15 ft), be removed between June 1 and September 15, the period in which roosting bats are potentially at risk from vegetation clearing.

**Other Resources of Concern**

**Critical Habitat / Jurisdictional Waters**

No federally designated Critical Habitat occurs in the project area; no equivalent statute exists under state law. No natural resources of preservation or conservation concern beyond those described above, occur in the Stadium project area. However, Hālawa Stream is a “Waters of the U.S.” (comes under Clean Water Act, federal jurisdiction [USACE & USEPA, 2019]). No other aquatic environments (streams, wetlands, tidal waters) occur on any of the surveyed properties.

- Construction activities within the channel structure of Hālawa Stream will require a Department of Army permit from the U.S. Army Corps of Engineers.

**References Cited**


Telfer, T. C. 1979. Successful Newell’s Shearwater Salvage on Kaua‘i. *Elepaio* 39: 71


Appendix D:
Archeological Literature Review and Field Inspection Survey
Draft

Archaeological Literature Review and Field Inspection Report for the New Aloha Stadium Entertainment District (NASED) Project, Hālawa Ahupuaʻa, ʻEwa District, Oʻahu

TMKs: [1] 9-9-003:055, 061, 070, and 071

Prepared for
Wilson Okamoto Corporation on behalf of the
Department of Accounting and General Services (DAGS)

Prepared by
Tyler Turran, B.A.,
David W. Shideler, M.A.,
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawaiʻi, Inc.
Kailua, Hawaiʻi
(Job Code: HALAWA 28)

April 2020

Reference

Date
April 2020

Project Number(s)
Cultural Surveys Hawaiʻi, Inc. (CSH) Job Code: HALAWA 28

Investigation Permit Number
CSH completed the fieldwork for this study under archaeological fieldwork permit number 19-07, issued by the Hawaiʻi State Historic Preservation Division (SHPD) per Hawaiʻi Administrative Rules (HAR) §13-13-282.

Agencies
SHPD; Department of Accounting and General Services (DAGS)

Land Jurisdiction
State of Hawaiʻi

Project Proponent
It is understood that DAGS is the NASED project proponent.

Project Funding
DAGS

Project Location
The project area is located in coastal Hālawa Ahupuaʻa, ʻEwa District, central south shore of Oʻahu. The NASED project involves four parcels separated by Salt Lake Boulevard. The larger northeastern parcel is located at Tax Map Key (TMK): [1] 9-9-003:061 at 99-500 Salt Lake Boulevard (approximately 87.59 acres) which includes the existing Aloha Stadium and an adjacent parking area to the southeast generally bounded by Kamehameha Highway on the west, Moanalua Freeway on the north, the H-1 Freeway to the east, and Salt Lake Boulevard to the south. A smaller southwest parcel, TMK: [1] 9-9-003:071 at 99-232 Kamehameha Highway (approximately 7.29 acres) is generally bounded by Kamehameha Highway to the northwest, and legs of Salt Lake Boulevard on the northeast, southeast, and southwest sides. The two other smaller discrete parcels include TMK: [1] 9-9-003:055 (2.57 acres) bounded by Salt Lake Boulevard to the northwest and northeast and a small linear parcel (0.87 acre) at TMK: [1] 9-9-003:070 bounded by Kamehameha Highway on the northwest and Salt Lake Boulevard on the northeast.

The project areas are depicted on a portion of the Pearl Harbor (1999) and Waipahu (1998) U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles.
Project Description
The proposed project includes redeveloping all four portions of the project area. Proposed work involves construction of the new Honolulu Rail Transit Project (HRTP) Hālawa Station, commercial buildings with parking and retail, residential buildings with parking and retail, retail entertainment oriented “Main Street” and plazas, Aloha Stadium gateway, grand entrance to stadium plaza, Aloha Stadium plaza, entertainment district, residential neighborhood, existing surface parking, hotel and conference center with parking deck, pedestrian bridges over Hālawa Stream with local road access on both sides, expanding access to/from the Interstate H-3 Freeway and Moanalua Freeway (H-201), expanding Salt Lake Boulevard, garden forecourt, service access on south side of the stadium, a surface parking lot, and a multi-use recreational field and neighborhood park.

Project Acreage
The larger northeastern parcel (TMK: [1] 9-9-003-061) is approximately 87.59 acres and the smaller southwest parcels are TMK: [1] 9-9-003-055 (2.57 acres), TMK: [1] 9-9-003-070 (0.87 acres), and TMK: [1] 9-9-003-071 (7.29 acres) for a total project area of approximately 98.32 acres (39.79 hectares).

Scope
This archaeological literature review and field inspection (LRFI) report is focused on efforts at identification of archaeological historic properties and burial sites based on a review of historical records and prior archaeological reports and a field inspection. The identification, documentation, and evaluation of in-use, potential architectural historic properties, such as historic buildings and structures, was outside the scope of this LRFI. Throughout this report the term “historic properties” is used and should be generally understood to refer to archaeological historic properties, unless otherwise stated.

The vicinity of the former Land Commission Awards (LCAs) and the margins of Hālawa Stream that pass through the largest of the project areas were more intensively inspected. This is due to burials documented in LCAs near the project area and a heightened probability of subsurface historic properties in these areas. The rest of the project areas have been greatly modified by agriculture followed by development of the stadium and other urban infrastructure.

Study Area Acreage
For the purposes of this LRFI, the project area for archaeological historic properties is defined as the entire total approximately 98.32-acre project construction footprint.

The surrounding built environment is urban (paved streets, highway on and off ramps, and low-rise commercial buildings) and the proposed project construction is unlikely to impose additional auditory, visual, or other environmental impacts to any surrounding potential archaeological historic properties outside the project construction footprint. Preliminary consultation with the SHPD did raise a need to confirm with the U.S.

Historic Preservation Regulatory Context
Navy the assessment that the NASED project will have no adverse effect on the Pearl Harbor Naval Base National Historic Landmark, State Inventory of Historic Places (SIHP) # 50-80-13-9902.

Historic Preservation
William Barrera (1971) carried out an archaeological reconnaissance survey for the then proposed Honolulu Stadium. No historic properties were identified.

CSH (Sroat et al. 2012) produced an archaeological inventory survey for Construction Phase 2 of the Honolulu High-Capacity Transit Corridor project (now termed HRTP) that extended along Kanehameha Highway on the makai (seaward, west) side of the stadium parcel (TMK: [1] 9-9-003-061) and included the entirety of TMK: [1] 9-9-003-071 (proposed as the Aloha Stadium Station and a “Park and Ride” lot for the HRTP).

The study identified no historic properties in the vicinity. The Sroat et al. (2012) study was accepted in an SHPD National Historic Preservation Act (NHPA) Section 106 Consultation review dated 23 May 2012 (Log No.: 2012.1449. Doc. No.: 1205NN23).

At this time, it is understood that there is no federal nexus to this project that would trigger Section 106 consultation under the NHPA as amended. Should this change, DADS should inform the SHPD promptly.

Fieldwork Effort
Surface survey fieldwork was accomplished between 20 and 21 May and 5 October 2019 by Alexandra Bennicas, B.A., Brittany Enanoria, B.A., and Tyler Turran, B.A., under the general supervision of Principal Investigator Hallett Hammatt, Ph.D. This work required approximately 2.5 person-days to complete.

Consultation
Preliminary consultation with SHPD (Dr. Susan Lebo) was conducted on 9 July 2019.

Summary of Findings
No historic properties have been previously identified in the project area and none were identified in this LRFI’s field inspection.

This study presents a summary of potential historic properties related to traditional Hawaiian occupation, the rice-cultivation era in the late 1800s, the Honolulu Plantation Company independent homestead program, and World War II. The possibility of burials relating to areas of plantation housing within the project area is explored.

Historic Preservation Recommendations
The results of this LRFI indicate there is potential for archaeological historic properties in the project area. This LRFI supports the completion of an archaeological inventory survey (AIS) for historic property identification purposes as the next step in the project’s historic preservation review process.

The AIS should have a subsurface testing component that targets the areas of the LCAs and plantation-era homesteads along Hālawa Stream within the project area. The SHPD has indicated a need for some geographically representative testing.
Table of Contents

Management Summary ........................................................................................................... i
Section 1 Introduction ............................................................................................................ 1
  1.1 Project Background ..................................................................................................... 1
  1.2 Historic Preservation Regulatory Context and Document Purpose ....................... 1
      1.2.1 Natural Environment ......................................................................................... 5
      1.2.2 Built Environment ............................................................................................. 7
Section 2 Methods .................................................................................................................. 8
      2.1 Field Methods ....................................................................................................... 8
      2.2 Research Methods ................................................................................................. 8
Section 3 Background Research ............................................................................................ 10
      3.1 Mythological and Traditional Accounts ............................................................... 10
      3.1.1 A Note on the Cliff (1970)-reported Heiiau ...................................................... 15
      3.1.2 Early Historic Period ......................................................................................... 15
      3.1.3 The Måhele ....................................................................................................... 17
      3.1.4 Land Disputes of the 1800s ............................................................................... 20
      3.1.5 Mid- to Late 1800s ............................................................................................. 22
      3.1.6 The Early Twentieth Century and the Rise of the Honolulu Plantation Company .... 27
      3.1.7 A Note About ‘Aiaea Cemetery ........................................................................ 31
      3.1.8 Mid-Twentieth Century ..................................................................................... 39
      3.1.9 Aiona Stadium .................................................................................................. 42
      3.2 Previous Archaeological Research ....................................................................... 48
      3.2.1 Early Archaeological Research at Hålawa ......................................................... 48
      3.2.2 Recent Archaeological Research in the Vicinity of the Project Area .......... 56
      3.2.3 Previous Archaeological Work in the Project Area ......................................... 62
Section 4 Results of Fieldwork ............................................................................................. 65
Section 5 Summary and Interpretation .................................................................................. 73
      5.1 Review of Potential Historic Properties Related to Traditional Hawaiian Occupation . 73
      5.2 Review of Potential Historic Properties Related to the Rice Era in the Late 1800s ........ 73
      5.3 Review of Potential Historic Properties Related to the Honolulu Plantation Company Independent Homestead Program ................................................................. 73
      5.4 Review of Potential Historic Properties Related to World War II ......................... 76
      5.5 Possible Architectural Concerns ......................................................................... 76
Section 6 Historic Preservation Recommendations .............................................................. 77
Section 7 References Cited .................................................................................................... 78
Appendix A LCA Data .......................................................................................................... 84
Appendix B Data on Excavations in the Immediate Vicinity adapted from the Sroot et al. 2012 AHS study ................................................................. 94

List of Figures

Figure 1. Portion of the 1998 Waipahu and 1999 Pearl Harbor USGS 7.5-minute topographic quadrangle maps showing the location of the project area ......................... 2
Figure 2. TMK: [1] 9-9-003 showing the project area (Hawai‘i TMK Service 2019) ........... 3
Figure 3. Aerial photograph showing the project area (Google Earth 2017) .................... 4
Figure 4. 2017 Google Earth Aerial Imagery with overlay of Soil Survey of the State of Hawaii (Foose et al. 1972; USDA SSURGO 2001), indicating soil types within and surrounding the project area ............................................................................ 6
Figure 5. 2017 Google Earth aerial imagery depicting the project area and archaeological field inspection track log ................................................................. 9
Figure 6. USGS Orthomage aerial photograph (2011) with place names of Hålawa Ahupua‘a’a ................................................................................................................. 11
Figure 7. Portion of Rockwood map of trails of Leeward O‘ahu, ca. 1810 (T‘i 1959:96) showing the project area .................................................................................. 12
Figure 8. Portion of 1817 Kotzebue map of the South Coast of O‘ahu showing the location of the project area and indicating the rich agricultural (ponded taro) lands on the margins of Pearl Harbor ................................................................. 16
Figure 9. Google Earth aerial photograph (2017) showing LCAs in the vicinity of the project area ........................................................................................................... 18
Figure 10. Composite 1848-1970s map of Hålawa Kuleana Land Commission Awards (Klieger 1995:61) with location of project area .................................................. 19
Figure 11. Summary of land disputés in Hålawa Ahupua‘a (Klieger 1995:50) ................. 21
Figure 12. Portion of an 1873 Lyons map of Pearl Lochs and Pauloa Entrance (RM 1639) showing the overlay of the project area in relation to the agricultural fields .......... 24
Figure 13. Portion of a 1874 Lyons map of Aiea (RM 323) showing the overlay of the project area in relation to the agricultural fields ................................................. 25
Figure 14. Portion of 1888 Monsarrat map of Hålawa (RM 1687) showing the overlay of the project area in relation to the agricultural fields ......................................... 26
Figure 15. Portion of a 1899 Beasley Hawaiian Government Survey map of O‘ahu showing the project area ................................................................. 28
Figure 16. Portion of a 1900–1925 map of the property of Honolulu Sugar Company (RM 2643) showing the project area ................................................................. 29
Figure 17. Portion of 1906 Donn Hawaii Territory Survey map of Oahu with land use (RM 2374) showing an overlay of the project area location ......................................... 30
Figure 18. Map of the Honolulu Plantation Company (Conde and Best 1973:331) showing an overlay of the project area location ......................................................... 32
Figure 19. Portion of 1919 Pearl Harbor U.S. Army War Department fire control map showing an overlay of the project area location showing branching roads and railroads and numerous houses in the central east side of the large stadium parcel believed to relate to an “independent homestead program” of the Honolulu Plantation Company established in a former Hawaiian LCA cluster ................. 33
Figure 20. Portion of the 1921 Newton and Chaney Aiea Makai map (RM 2677) showing the 'Aiea Cemetery on a pronounced bluff—the makai (southwest) portion of which is eventually removed by a military activity; Kamehameha Highway construction (from Sroat et al. 2012:227) ................................................................. 34

Figure 21. Portion of 1933 Land Court Application 966, Map 2 showing south portion of the project areas with approximately 16 buildings south of Hālāwai Stream on the southeast side of the large stadium parcel (there was almost certainly another grouping of houses within the large stadium parcel near the north edge of this map that is not shown) .......................................................................................................................... 35

Figure 22. Close-up of 1933 HDOH engineering plan map of the development of Kamehameha Highway, showing what appears to be the area of 'Aiea Cemetery, the existence of approximately 414 graves in the highway right-of-way, and the grading profile of the highway relative to the previous land; note the significant difference between the “Finished Grade” and “Profile Ground” (1933 Hawai‘i Department of Transportation engineering plans for the development of Kamehameha Highway, Map 4300.10) (from Sroat et al. 2012:228) .............................................................. 36

Figure 23. Portion of the 1935 Waipahu U.S. Army War Department terrain map showing the project areas with branching roads and railroads and approximately 18 buildings on the central east side of the large stadium parcel .................................................................................................................. 37

Figure 24. 1939 U.S. Army Air Corps aerial photograph with the project area overlay (Hawai‘i State Archives) .................................................................................................................................................. 38

Figure 25. Portion of a 1943 Aiea U.S. Army War Department terrain map showing project area .................................................................................................................................................. 40

Figure 26. 1952 USGS aerial photograph (UHI MAGIS) showing project area .................................................................................................................................................. 41

Figure 27. Portion of a 1953 Puuola and 1954 Waipahu USGS topographic quadrangles showing project area .................................................................................................................................................. 43

Figure 28. Portion of a 1968 Puuola and Waipahu USGS topographic quadrangles showing project area .................................................................................................................................................. 44

Figure 29. 1968 USGS aerial photograph (UHI MAGIS) showing project area overlay .................................................................................................................................................. 45

Figure 30. Photograph of the original development of the Aloha Stadium (Aloha Stadium 2019) .................................................................................................................................................. 46

Figure 31. Photograph of the original development of the Aloha Stadium (Aloha Stadium 2019) .................................................................................................................................................. 46

Figure 32. Photograph of the original development of the Aloha Stadium (Aloha Stadium 2019) .................................................................................................................................................. 47

Figure 33. Portion of a 1998 Waipahu and 1999 Pearl Harbor USGS topographic quadrangles with overlay of previous archaeological studies in the vicinity of the project area .................................................................................................................................................. 49

Figure 34. Portion of a 1998 Waipahu and 1999 Pearl Harbor USGS topographic quadrangles with overlay of previously identified historic properties in the vicinity (within approximately 1 km) of the project area .................................................................................................................................................. 53

Figure 35. Survey area and SHIP # 50-80-09-5306 feature location map from Cluff (1970: 22) (the large stadium project area is immediately to the west (left) side ......... 57

Figure 36. Tombstones of SHIP # 50-80-09-5306 Feature 7 from (Cluff 1970:22), five of the death dates are between 1934 and 1940 and one is significantly earlier (1906); four appear to have been Hawaiian and two to have been Portuguese .................................................. 58

Figure 37. Barrera (1971) Archaeological Site Survey of the Proposed Honolulu Stadium Site at Hālāwai, ‘O‘ahu .................................................................................................................................................. 63

Figure 38. Overview of the property with Aloha Stadium in the background; view to northwest .................................................................................................................................................. 66

Figure 39. Overview of the south end of the Aloha Stadium parking lot; view to southeast ................................................................. 66

Figure 40. Overview of the west corner of the parking lot with the HRTP rail line; view to north .................................................................................................................................................. 67

Figure 41. Overview of the east portion of the Aloha Stadium parking lot; view to east .................................................................................................................................................. 67

Figure 42. Overview of the portion of the Hālāwai Stadium that is in the project area; view to north .................................................................................................................................................. 68

Figure 43. Overview of the portion of the Hālāwai Stadium that is in the project area; view to southwest .................................................................................................................................................. 68

Figure 44. Monument at front entrance of the Aloha Stadium, view to east .................................................................................................................................................. 69

Figure 45. Statue on display at the front entrance of Aloha Stadium; view to northwest .................................................................................................................................................. 69

Figure 46. Close-up of a plaque on the monument fronting Aloha Stadium with 1980 date; view to northeast .................................................................................................................................................. 70

Figure 47. Close-up of a metal plaque on the statue with a date of 1981; view to northwest .................................................................................................................................................. 70

Figure 48. Northwestern portion of the project area showing construction activities for the HRTP Hālāwai Station; view to southwest .................................................................................................................................................. 71

Figure 49. Southern portion of the project area showing current Kiewit construction mobile office and parking lot; view to northwest .................................................................................................................................................. 71

Figure 50. Southern portion of the project area showing swale, residential areas to the left, and a portion of Salt Lake Boulevard to the right; view to southwest .................................................................................................................................................. 72

Figure 51. Southwestern portion of the project area showing ongoing construction activities of the HRTC Hālāwai rail line; view to southwest .................................................................................................................................................. 72

Figure 52. Close-up of a portion of the 1919 U.S. Army War Department fire control map; Pearl Harbor Quadrangle showing plantation homes on the large stadium project area with a superimposition of the Cluff (1970) designated historic property with seven features (SHIP # 5306 including four burial features) .................................................................................................................................................. 75

Figure 53. Photograph of the southeast wall profile of Trench E24, view to the northwest .................................................................................................................................................. 95

Figure 54. Photograph of the southwest wall profile of Trench E24, view to the northwest .................................................................................................................................................. 95

Figure 55. Photograph of the location of Trench E25, view to the northwest .................................................................................................................................................. 98

Figure 56. Photograph of the west wall profile of Trench E25, view to the northwest .................................................................................................................................................. 98

Figure 57. Profile of the west wall of Trench E25 .................................................................................................................................................. 99

Figure 58. Test trench locations for the Aloha Stadium Station and Park and Ride project area .................................................................................................................................................. 102

Figure 59. Photograph of Trench AS1, located in the northeastern region of the proposed Park and Ride facility, showing general overview, view to the southeast .................................................................................................................................................. 103

Figure 60. Photograph of the location of Trench AS1, view facing southeast .................................................................................................................................................. 103

Figure 61. Profile of the southeast wall of Trench AS1 .................................................................................................................................................. 104

Figure 62. Photograph of Trench AS2, showing general overview, view to the northeast .................................................................................................................................................. 105

Figure 63. Photograph of Trench AS2, showing the profile wall, view facing northeast .................................................................................................................................................. 106
### Section 1 Introduction

#### 1.1 Project Background

At the request of Wilson Okamoto Corporation and on behalf of the State of Hawai‘i Department of Accounting and General Services (DAGS), Cultural Surveys Hawai‘i, Inc. (CSH) has prepared this archaeological literature review and field inspection report (LRFI) for the New Aloha Stadium Entertainment District (NASED) Project, Hālawa Ahupua‘a, ‘Ewa District, O‘ahu. Tax Map Key (TMK): [1] 9-9-003:055, 061, 070, and 071. The project area is located in coastal Hālawa Ahupua‘a, ‘Ewa District, central south shore of O‘ahu. The NASED project involves four parcels separated by Salt Lake Boulevard. The larger northeastern parcel is located at TMK: [1] 9-9-003:061 at 99-500 Salt Lake Boulevard (approximately 87.59 acres) which includes the existing Aloha Stadium and an adjacent parking area to the southeast generally bounded by Kamehameha Highway on the west, Moanalua Freeway on the north, the H-1 Freeway to the east, and Salt Lake Boulevard to the south. A smaller southwest parcel (TMK: [1] 9-9-003:071) at 99-232 Kamehameha Highway (approximately 7.29 acres) is generally bounded by Kamehameha Highway to the northwest, and legs of Salt Lake Boulevard on the northeast, southeast, and southwest sides. The two other smaller parcels include TMK: [1] 9-9-003:055 (approximately 2.57 acres) bounded by Salt Lake Boulevard to the northwest and northeast and TMK: [1] 9-9-003:070 (approximately 0.87 acres) bounded by Kamehameha Highway on the northwest and Salt Lake Boulevard on the southeast. The total project area is approximately 98.32 acres (39.79 hectares). The project area is depicted on a portion of the 1998 Waipahu and 1999 Pearl Harbor U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles (Figure 1), TMK: [1] 9-9-003 plat map (Figure 2), and a 2017 aerial photograph (Figure 3).

The proposed project includes redeveloping the four portions of the project area. Proposed work involves construction of the new Honolulu Rail Transit Project (HRTP) Hālawa Station, commercial buildings with parking and retail, residential buildings with parking and retail, entertainment oriented “Main Street” and plazas, Aloha Stadium gateway, grand entrance to stadium plaza, Aloha Stadium plaza, entertainment district, residential neighborhood, existing surface parking, hotel and conference center with parking deck, pedestrian bridges over Hālawa Stream with local road access on both sides, expanding access to/from the Interstate H-3 Freeway and Moanalua Freeway (H-201), expanding Salt Lake Boulevard, garden forecourt, service access on the south side of the stadium, a surface parking lot, and a multi-use recreational field and neighborhood park.

#### 1.2 Historic Preservation Regulatory Context and Document Purpose

This LRFI study is intended to support the proposed project’s historic preservation review under Hawai‘i Revised Statutes (HRS) §6E-8 and Hawai‘i Administrative Rules (HAR) §13-275 as well as the project’s environmental review under HRS §343. It is also intended to support any project-related historic preservation consultation with stakeholders, such as state and county agencies and interested Native Hawaiian Organizations (NHOs) and community groups.

At this time, it is understood that there is no federal nexus to this project that would trigger Section 106 consultation under the National Historic Preservation Act (NHPA), as amended. Should this change, DAGS should inform the State Historic Preservation Division (SHPD) promptly.
Figure 1. Portion of the 1998 Waipahu and 1999 Pearl Harbor USGS 7.5-minute topographic quadrangle maps showing the location of the project area.
1.3 Environmental Setting
1.3.1 Natural Environment

The NASED project area is situated east of the East Loch of Pearl Harbor on the central south shore of O`ahu on a coastal plain straddling Hālawa Stream approximately 220 m from the shoreline. Elevations in the study area range from approximately 1 to 18 m above mean sea level. The study area receives an average of approximately 953 mm (37.5 inches) of annual rainfall (at “Area Field 84” gage; Giambelluca et al. 2013). This is suggested to be marginal for non-irrigated agriculture. The vegetation in the study area and immediate vicinity consists primarily of introduced landscaping trees, shrubs, and ground cover plants.

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Foote et al. (1972), the project area’s soils consist of Hanalei Silty Clay, 2 to 6% slopes (HnB), Honouliuli Clay, 0 to 2% slopes (HxA), Kawaihapa Clay Loam, 0 to 2% slopes (KIA), Makalapa Clay, 2 to 6% slopes (MfB), and Wapahu Silty Clay, 2 to 6% slopes (WzA) (Figure 4).

Soils of the Hanalei Series (HnB) are described as follows:

This series consists of somewhat poorly drained to poorly drained soils on bottom lands on the islands of Kauai and O`ahu. These soils developed from fine grained rock. They are level to gently sloping. Elevations range from nearly sea level to 300 feet. […]

These soils are used for taro, pasture, sugarcane, and vegetables. The natural vegetation consists of paragrass, sensitiveplant, homohonohono, Java plum, and guava. [Foote et al. 1972:38]

Hanalei Silty Clay, 2 to 6% slopes (HnB) soils are further described as soils where “runoff is slow and the erosion hazard is slight” (Foote et al. 1972:38).

Soils of Honouliuli Series (HxA) are described as follows:

This series consists of well-drained soils on coastal plains on the island of O`ahu in the ‘Ewa area. These soils developed in alluvium derived from basic igneous material. They are nearly level and gently sloping. Elevations range from 15 to 125 feet […]

These soils are used for sugarcane, truck crops, orchards, and pasture. The natural vegetation consists of kiawe, koa haole, fingergrass, bristly foxtail, and bermudagrass. [Foote et al. 1972:43]

Honouliuli Clay, 0 to 2% slopes (HxA) soils are further described as follows:

occurs in the 1owlands along the coastal plains. Included in mapping were small areas of fine-textured alluvial soils that have a stony subsoil. Also included were small areas of shallow, red, friable soils, that are underlain by reef limestone […]

Permeability is moderately slow. Runoff is slow, and the erosion hazard is no more than slight. [Foote et al. 1972:43]
Soils of the Kawaihapai Series are described as follows:
This series consists of well-drained soils in drainage ways and on alluvial fans on the coastal plains on the islands of O‘ahu and Moloka‘i. These soils formed in alluvium derived from basic igneous rock in humid uplands.

They are nearly level to moderately sloping. Elevations range from nearly sea level to 300 feet […]

These soils are used for sugar cane, truck crops, and pasture. The natural vegetation consists of kiawe, koa haole, lantana, and bermudagrass. [Foote et al. 1972:63-64]

Kawaihapai Clay Loam, 0 to 2% slopes (KIA) soils are further described as follows:
This soil occupies smooth slopes. Included in mapping were small areas where the slope is 3 to 7 percent and the texture is silty clay. Also included were small areas of poorly drained soils and small areas of Jauca soils […] Permeability is moderate. Runoff is slow, and the erosion hazard is no more than slight. [Foote et al. 1972:64]

Soils of the Makalapa Series are described as follows:
This series consists of well-drained soils on uplands on the island of Oahu, near Salt Lake Crater, Diamond Head, and the Mokapu Peninsula. These soils formed in volcanic tuff. They are gently sloping to moderately steep. Elevations range from 20 to 200 feet […]

These soils are used for urban development and pasture. The natural vegetation consists of kiawe, koa haole, lantana, bermudagrass, and fingergrass. [Foote et al. 1972:87]

Makalapa Clay, 2 to 6% slopes (MDB) soils are further described as follows:
This soil is gently sloping. Included in mapping were small areas of Mamala soils and small areas of saline soils within Salt Lake Crater and Diamond Head […] Permeability is slow. Runoff is slow, and the erosion hazard is slight. [Foote et al. 1972:87]

Soils of the Waipahu Series are described as follows:
This series consists of well-drained soils on marine terraces on the island of O‘ahu. These soils developed in old alluvium derived from basic igneous rock. They are nearly level to moderately sloping. Elevations range from nearly sea level to 125 feet. [Foote et al. 1972:134]

Waipahu Silty Clay, 2 to 6% slopes (WzA) soils are further described as follows: “On this soil, runoff is slow and the erosion hazard is slight” (Foote et al. 1972:134).

1.3.2 Built Environment
The study area is within a predominantly urban landscape, including the current Aloha Stadium, parking for the stadium, and development associated with the stadium. The portion of the Hālawa Stream that crosses the project area is channelized.
Section 2 Methods

2.1 Field Methods

CSH completed the fieldwork component of this AIS under archaeological fieldwork permit number 19-07, issued by the SHPD pursuant to HAR §13-282. Fieldwork was conducted between 20 and 21 May and 5 October 2019 by Alexandra Bennicas, B.A., Brittany Emannora, B.A., and Tyler Turran, B.A., under the general supervision of Principal Investigator Hallett Hammatt, Ph.D. This work required approximately 2.5 person-days to complete.

In general, fieldwork included 100% pedestrian inspection of the project area and GPS data collection (Figure 5). The field inspection of the project area was undertaken for the purpose of recording the general characteristics of the project area, and to determine the potential for historic properties to be present within the project area. The pedestrian survey was accomplished through systematic surveying along both sides of the roadways within the project area.

A handheld Garmin GPSMAP 64 was used to record the archaeologist’s track log. This handheld unit provided horizontal accuracy between 3 and 5 m. GPS field data was post-processed, yielding horizontal accuracy between 0.5 and 0.1 m. GPS location information was converted into GIS shape files using Trimble’s Pathfinder Office software, version 5.85, and graphically displayed using ESRI’s ArcGIS 10.5. CSH utilizes the NAD 83 HARN datum and UTM Zone 4N.

2.2 Research Methods

Background research included a review of previous archaeological studies on file at the SHPD; review of documents at Hamilton Library of the University of Hawai‘i, the Hawai‘i State Archives, the Mission Houses Museum Library, the Hawai‘i Public Library, and the Bishop Museum Archives; study of historic photographs at the Hawai‘i State Archives and the Bishop Museum Archives; and study of historic maps at the Survey Office of the Department of Land and Natural Resources. Historic maps and photographs from the CSH library were also consulted. In addition, Mihele records were examined from the Waihona ‘Aina database (Waihona ‘Aina 2020).

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

Figure 5. 2017 Google Earth aerial imagery depicting the project area and archaeological field inspection track log
Section 3  Background Research

In 1873, S.K. Kuhano wrote about ancient O‘ahu land divisions. O‘ahu was divided into six moku or districts: Kona, ‘Ewa, Wai‘anae, Waialua, Ko‘olaau, and Ko‘olaupoko. These moku were further divided into 86 ahupua‘a (land divisions typically running from the mountains to the sea). Within ‘Ewa, there were 12 ahupua‘a. They were listed as Hālawa, ‘Aiea, Kaluaau, Waimānu, Waiāu, Waimano, Mānana, Waiawa, Wai‘pio, Waikēle, Hō‘ae‘ae, and Honouliuli (Kame‘elehiwa 1992:330). Modern maps and land divisions still follow the ancient system and use the same land divisions, with the exception that a distinction is made between North and South Hālawa. This division in the case of Hālawa is due to a land court decision that occurred in 1888 (Bureau of Conveyances 1888, Liber 113:14,17 in Klieger 1995:50). Hālawa is the easternmost ahupua‘a of ‘Ewa District, bounded by the ‘Ewa ahupua‘a of ‘Aiea and Kalaaau to the northwest and by Moanalua Ahupua‘a of Honolulu (Kona) District to the southeast (Figure 6).

3.1 Mythological and Traditional Accounts

Considering its rich and varied environment of coastal and stream resources, central plains for lo‘i (taro pond fields), and upland forest regions, information regarding pre-Contact and early post-Contact life in Hālawa is limited, especially for the upland sections. The majority of the early historic references speak of the fishponds at Pu‘ula (the Hawaiian name for Pearl Harbor), the coastal resources, and excursions by early visitors to the Pearl River (known variously in Hawaiian as “Wai mōno” “Awalau” and “Pu‘ula”; see Sterling and Summers 1978:46). Most early references in the traditional literature are one-line passages that merely mention Hālawa in passing with little attention to detail. People traveled through Hālawa from ‘Ewa to Honolulu or vice versa, but most of these travels seem to have taken place inland of the ‘Ailămānau and Salt Lake (‘Ailiap‘aka) craters and well inland of the current study area (Figure 7). Once the trail left the northeast margin of the East Loch of Pearl Harbor, it could have been traversed quickly across the 1.6-km (1-mile) width of Hālawa Ahupua‘a by a traveler heading to Kona District. Perhaps this explains the ‘i‘eōle no‘eau (Hawaiian proverb) ‘Ike ‘ele ‘e ‘a aku Hālawa lā; Āna i ka mole o ‘Ewa lā. (Hālawa is not to be seen; ‘tis a land at the end of ‘Ewa; Fornander 1917:606). This may be a reference to the location of Hālawa on the fringes of ‘Ewa District in relation to Waipi‘o in central ‘Ewa, which was the center of politics during pre-Contact times.

A fourteenth account speaks of the reign of Mō‘ili‘ikākahī, an ali‘i kapu (sacred chief) who was born at Kīkaniloko in Wahiawā around the fourteenth century AD (Pukui et al. 1974:113). After consenting to become mō‘ili‘ikākahī at the age of 29, Mō‘ili‘ikākahī was taken by the chiefs to live at Waiikīkī. The story tells us that he was probably one of the first chiefs to live there. Up until this time, the chiefs had always lived at Waialua and ‘Ewa. Under his reign, the land divisions were reorganized and redefined. In reference to the productivity of the land and the population (including at Hālawa) during Mō‘ili‘ikākahī’s reign, Kamakau writes,

In the time of Mō‘ili‘ikākahī, the land was full of people. From the brow, lae, of Kahului to the brow of Mauna‘ena in ‘Ewa, from the brow of Mauna‘ena to the brow of Pu‘u‘kea [Pu‘u Ku‘u‘a] the land was full of chiefs and people. From Kāne‘ewai to Halemāno in Wai‘alua, from Halemāno to Paupali, from Paupali to Hālawa in ‘Ewa the land was filled with chiefs and people. [Kamakau 1991:55]
Oral tradition tells us that Hālawa was the home of Papa, where she lived in the uplands with her parents, Kahakauakoko and Kākālani’eahu. Papa is known for her generative role as the “earth mother.” Together with her husband, Wākea, they were the progenitors of the Hawaiian race. The Hale o Papa heiau (pre-Christian place of worship) and ritual, which is the female component of the ancient hauikini (large heiau where ruling chiefs prayed and human sacrifices were offered) ritual, probably takes its name from her. The Hale o Papa was the heiau for the female deities. Only chieftesses of the highest ranks were allowed to enter and partake of the specially dedicated foods (ʻĪo 1959:39; Kamakau 1961:179, 380; Valeri 1985:245).

Mention is made of the travels of Kamapua’a (the famous pig-god) through Hālawa and of the cave, Keanapua’a (see place name on Figure 6), where he slept (Kame‘elehiwa 1996:131).

In the name chant for Kaumuali‘i, reference is made to “ka ea nō mai Hālawa a Honouliuli” (the whirlwind which blows from Hālawa to Honouliuli) (Fornander 1919:5:475).

In traditional lore, Hālawa was one of several places noted and remembered for its ‘awa (Piper methysticum, the source of a narcotic drink) (Fornander 1919:5:610). One account tells us that the first ‘awa plant was brought to Hawai’i by Olikīkakehana from Kahī (Tahiti) and planted on Kaua‘i. He brought it to Hawai‘i for use in fishing. The use of ‘awa as an offering to a shark guardian by fishermen is noted in Handy and Handy 1972:192. Mōʻikehā brought some ‘awa plants with him to O‘ahu and planted them at Hālawa. When they grew, he mentioned it to Olikīkakehana, who told him the name of these ‘awa plants was Paholei. Mōʻikehā forgot the name and later, when the plants were much larger, he went to ‘Ewa and told her about the plants. ‘Ewa sent Mōʻikehā to get some plants. ‘Ewa said,

‘Let me first eat of this plant, and should I die, do not plant it for it would be valueless; but should I not die, then we will be rich.’ When ‘Ewa ate it she became drunk and was intoxicated all day. When she awoke she called the plant ‘awa’; from thence forward this plant was called ‘awa, the awa of Kaumaka’eha, the chief.’

[Fornander 1919:5:608]

On 12 December 1794, the decisive battle of Kūki‘i’ahu took place at Kaluauo (ʻī. the multitude of clouds). It was there that the O‘ahu ruling chief Kalanikūpule defeated and killed the invader Ka‘eokilani. It is said that the dead bodies were gathered up and taken to Pa‘aiwa where they were piled in a great heap. Among the piled-up bodies was Kahulumuka’aumoku, daughter of Ki‘ōhu, a Kaui‘i kahuna (priest) who had been slain with Ka‘eokilani. Late at night, an owl woke her up by flying over and beating its wings on her head. The owl flew makai (seaward) and she crawled after it until reaching the sea. She then swam to the other side at ‘Aiea, where the owl appeared once more and led her up to the mountains in Hālawa valley. There, she took shelter in a cave and fell into an unconscious sleep. The owl flew to a former kahu (caretaker) of hers who “knew the country well around Hālawa.” This kahu brought her food and nursed her back to health (Kamakau 1961:169–70).

During the construction of the H-3 freeway, Mālama o Hālawa protesters used this story as basis for claiming Hālawa’s importance to women. They maintained that Hālawa was an important and special healing site for women in times past and that it was also home of the protective ʻaumakua (guardian), the pueo (owl) (Omandam 1997).
The following *mo’olelo* (stories) are accounts regarding people and events that took place in or near Hālawa. These accounts have been preserved through the oral and written record of times long past.

**Leilono** (see Figure 7)—a supernatural breadfruit tree (‘Ulu o Leilono) whose branches appeared through a hole in the ground. This hole was said to be the entrance whereby wandering spirits could enter the afterworld of Milu (pō pau ‘ole), the ao *kuewa* or realm of wandering spirits, or the ao *‘amakaua* (ancestral spirit realm). The tree’s two branches were deceiving to look at, one on the east side of the tree and one on the west side. If a spirit climbed onto the west branch, it would wither and break off and he would plunge into the realm of Milu. If a spirit climbed onto the branch on the east, he would be able to see the ‘*amakaua* realm and receive help from his ancestors. This hole is described as being round and about 2 feet (ft) wide, on a piece of *pahoehe* lava. Leilono is in the neighboring district of Moanalua. However, very specific boundaries are given and Kamakau says it was close to the rock Kapūkākā and easterly of it […] directly in line with the burial mound of Aliamanu and facing toward the right side of the North Star […] The boundaries of Leilono were Kapapōkōlea on the east, [with] a huge caterpillar (pe‘elua nui) called Koleana as its eastern watchman, and the pool Napeha on the west, with a mo‘o the watchman there. If the soul was afraid of these watchmen and retreated, it was urged on by the ‘*amakaua* spirits, then it would go forward again and be guided to the ‘*amakaua* realm. If a soul coming from the Alia (Aliapa’akai) side was afraid of the caterpillar, whose head peered over the hill Kapapōkolea, and who blocked the way, it would wander about close to the stream by the harness shop. This was not the government road (alanui aupuni) of former times, but was a trail customarily used by ‘those of Kauihia‘ele’ (figuratively, the common people; the la‘ele, old taro leaves, as contrasted with the liko, the new and chooser leaves—that is, the chiefs). It was said that if a wandering soul entered within these boundaries it would die by leaping into the pō pau ‘ole; but if they were found by helpful ‘*amakāku* souls, some wandering souls were saved. Those who had no such help perished in the pō pau ‘ole of Milu. [Kamakau 1964:48-49]

The Napeha pool referred to above as a boundary of Leilono was about 2 km east of the NASED project areas (see Figure 6 and Figure 7). We know of no subsequent reference to the “burial mound of Aliamanu” but Aliamanu Crater lies about 2.5 km to the east.

**Nīpēhā** (see Figure 7)—a pool and resting place where people went diving. So named because Kūhī stopped and bent over the pool to take a drink. The name means “bend over breath” (‘*Tī* 1959-95). Sterling and Summers (1978:10) give the literal meaning as “out of breath.” Also, see Pukui et al. (1974:163) and Pukui and Elbert (1986:262) for variations in diacritical markings.

**Kauwamaoa** (see Figure 7)—a diving place where people liked to gather. It was said that Pe‘ape’a (son of Kamehamehania of Maui) liked to dive from a favorite spot five to ten fathoms above the pool (‘*Tī* 1959-95).

**Waikahi Heiau** (see Figure 6)—Site 105. The location was described by McAllister (1933:103) as being “on the flat area on the mountain side of the road where the two gulches of Hālawa meet.” According to *ThrUM* (1906:36), the size was about 80 square (sq) ft, it was a *po‘okanaha*

(sacrificial heiau), and Manuuoakao was the *kahuna*. In 1933, McAllister reported the area was entirely planted in cane and no remains whatsoever could be seen (McAllister 1933:103).

**Waipao Heiau** (see Figure 6)—Site 106. McAllister lists the location as being “near the mouth of Kamananui Gulch, Hālawa.” He goes on to say,

The structure was on a narrow flat at the entrance of a small ravine running into the north wall of the gulch. The heiau was destroyed a few years ago when there was an attempt to plant cane on this land, and the lines of stones which follow the old furrows are all that remain. My Hawaiian informant told me that the surrounding caves were formerly used as places of burial. [McAllister 1933:103]

**Loko Kūnānā (Kūnānā Pond)** (see Figure 6 and Figure 34)—said to be at the base of Hālawa Stream and was at one time connected with Kūhū Island. It was named after Kūnānā (child of Nānā) who liked to fish there. She was the mother of Ka‘ahupahu, the shark guardian of Pu’uloa (Sterling and Summers 1978:10).

**Ke'anaapua‘a Point** (see Figure 6)—(lit. the pig’s cave) so named because Ke’anaapua‘a, the legendary pig-god slept in the cave overnight. It is near the beach in Hālawa opposite Waipio Peninsula (Sterling and Summers 1978:10).

**Ke‘anaapua‘a (Story of)—**Upon awakening, after spending the night at Ke‘anaapua‘a, Ke‘anaapua‘a urninated in the ocean. This is the reason the fish at Pu’uloa have such a strong smell (Sterling and Summers 1978:10).

**Kahuwaiwai (Kahuwaiwai)** (see Figure 7)—a small waterfall on Kalauao Stream which was a favorite resting place exclusively for chiefs. It was also called Kahuwaiwai (the water gourd) (Pukui et al. 1974:66). It was also referred to by ‘*Tī* (1959:20) as “a land with two points” because the fish they were carrying (as food) were stiff and bent like hog tasks by the time they reached this resting spot.

### 3.1 A Note on the Cluff (1970)-reported Heiau

Deborah Cluff (1970-2) of the Department of Land and Natural Resources (DLNR) reported on an archaeological survey for a neighboring project area to the east of the large stadium parcel (see Section 4.2.1) in which she reports “Halawa residents and members of the Highways Division expressed concern over the location of numerous graves and the remains of a heiau.” The majority of the archaeological effort, including substantial excavation) was expended investigating the possible heiau site identified by Cluff as “Feature 1” (of subsequently assigned State Inventory of Historic Places [SHIP] # 50-80-09-5306) but the result was “it cannot be ascertained that Feature 1 is the site of the former temple” (Cluff 1970:6). A variety of post-Contact artifacts are reported from the feature (including glass and porcelain fragments, bits of red brick, a clay bead and a bullet) but a piece of worked mammal bone and “a chip from the cutting edge of a finely polished adze” and *fukui* nut shell are also reported (Cluff 1970:12, 14) indicating a traditional Hawaiian component to the feature. We know of no other account of a heiau in the vicinity.

### 3.1.2 Early Historic Period

Our first details about Hawaiian settlement in Hālawa come from explorers’ accounts and maps such as Otto von Kotzebue’s 1817 map of O‘ahu (Figure 8). While this early survey map should
be understood as rather schematic, it indicates the general pattern of coastal residence and agriculture. A quilt of ponded fields of taro (lo‘i kala) and fairly dense associated habitations are shown in the vicinity of the project area and mukai and extending west. This dense pattern of occupation began in the immediate vicinity of the mouth of Hālawa Stream and extended inland and westward along the margins of Pearl Harbor with its abundant marine resources, relatively fertile soils, and numerous streams. In contrast is the relative lack of habitation and agriculture to the east. The post-erosional volcanic land forms of Makalapa, Áliamanu Crater, and Salt Lake (Áliapa’akai) Crater effectively pushed Hālawa Stream to the northwest and Moanalua Stream to the southeast creating dryland in the rain shadow of a rain shadow.

The missionaries are credited with taking the first census in 1831–1832. However, there was no uniformity among the different stations and the census totals cover fairly large geographical areas. In addition, information was not necessarily broken down into smaller ahupua‘a and no distinctions were made among sex, age, birth, and death rates (Schmitt 1973:1).

The 1831–1832 census for O‘ahu was 29,755, with Honolulu being the most heavily concentrated area with 13,344 people. The ‘Ewa district was the third largest with a count of 4,015 (Schmitt 1977:8–9). In this census, Hālawa was combined with ‘Aiea. The census shows there were 163 males, 134 females, 72 male children, and 35 female children with a total count of 404 for the two ahupua‘a (Schmitt 1977:19). The reasonable inference is that these ahupua‘a were well-populated but not densely populated in comparison to the other ahupua‘a of ‘Ewa at the time.

There are no separate population figures given for Hālawa until the 1835–1836 census. At that time, there were 104 males, 102 females, 48 male children, 29 female children with a total count of 283 for the ahupua‘a. The total for ‘Ewa was 3,423, a decrease of 592 (seemingly a decline of 14.7% over 4 years) from the first census figures.

In 1839, for the purposes of tax assessment, a law was passed to take an official government census which was to be carried out by the tax officers in the various districts. This was intended to be completed in 1840 but was not carried out at the time. In 1846, a new law was enacted giving the responsibility of the computations to school officials. A count was undertaken in 1849, however, the results are suspected to be under reported. It was not until 1850 that a more systematic and accurate census was conducted (Schmitt 1977:3)

3.1.3 The Māhele

The Organic Acts of 1845 and 1846 initiated the process of the Māhele—the division of Hawaiian lands—which introduced private property into Hawaiian society. In 1848, the crown and the ali‘i (royalty) received their land titles. Kuleana awards for individual parcels within the ahupua‘a were subsequently granted beginning in 1850. These awards were presented to tenants—Native Hawaiians, naturalized foreigners, non-Hawaiians born in the Islands, or long-term resident foreigners who could prove occupancy on the parcels before 1845.

It is clear that ca. 1850 there was a relatively tight focus of Hālawa Ahupua‘a’s settlement and agriculture a little more than a kilometer upstream (Figure 9 and Figure 10). This likely was a general pattern extending back in time for centuries with Hālawa habitation focused well inland. There were no kuleana Land Commission Award (LCA) claims on the coastal plains of Hālawa Ahupua‘a except in the immediate vicinity of Hālawa Stream.
Figure 9. Google Earth aerial photograph (2017) showing LCAs in the vicinity of the project area

Figure 10. Composite 1844-1970s map of Hālawa Land Commission Awards (Kluger 1995:61) with location of project area
Table 1 (below) lists the LCAs within the present project area (all were within the large northeastern TMK. [1] 9-9-003.061 present day stadium parcel) which were all arrayed relatively close to Hālawa Stream (see Figure 9). Logically most of these were for ponded taro cultivation (lo’i or loko kalo) and must have had irrigation channels ('unwai) bringing in water off the stream. A large rectangular lot (LCA 2156.3 to Opunui) in the southwestern portion of the stadium parcel was a house (pāhale) lot.

The Klieger map (see Figure 10) provides additional detail on the project area in the mid-1800s. Klieger indicates there were several small fishponds developed off Hālawa Stream including two on the south side of the stream in the large stadium parcel (named Wa Kuho and Wai Kai)—but no detail is supplied. The route of one ‘unwai is indicated seemingly watering Opunui’s LCA 2156.1 lo’i off Hālawa Stream from well to the northeast.

Table 1. LCAs within the present project area

<table>
<thead>
<tr>
<th>LCA #</th>
<th>Claimant</th>
<th>Stated Location</th>
<th>Land use</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
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<td>1996</td>
<td>Naea</td>
<td>Kulina, Hālawa</td>
<td>“Mo o’aīna” (narrow strip of land)</td>
<td>Minimal data on land use</td>
</tr>
<tr>
<td>2047:1</td>
<td>Kekio</td>
<td>Kulina, Hālawa</td>
<td>Lo’i me kula</td>
<td>Taro patch and field</td>
</tr>
<tr>
<td>2047:2</td>
<td>Kekio</td>
<td>Kulina, Hālawa</td>
<td>Kula</td>
<td>Field</td>
</tr>
<tr>
<td>2139</td>
<td>Kimilau</td>
<td>Kulina, Hālawa</td>
<td>“Mo o’aīna” (narrow strip of land)</td>
<td>Minimal data on land use</td>
</tr>
<tr>
<td>2156:1</td>
<td>Opunui</td>
<td>Kalō’iiki, Hālawa</td>
<td>Lo’i</td>
<td>Taro patch, NW side borders a ditch ('unwai)</td>
</tr>
<tr>
<td>2156:2</td>
<td>Opunui</td>
<td>Kalō’iiki, Hālawa</td>
<td>Lo’i me ke kula</td>
<td>Taro patch and field</td>
</tr>
<tr>
<td>2156:3</td>
<td>Opunui</td>
<td>Kalō’iiki, Hālawa</td>
<td>Pāhale</td>
<td>House lot, SE side borders the stream (Kahawai)</td>
</tr>
<tr>
<td>2157</td>
<td>Not Awarded</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>9332:1</td>
<td>Kabaena</td>
<td>Kulina, Hālawa</td>
<td>Loko kalo</td>
<td>Taro patch</td>
</tr>
<tr>
<td>9332:2</td>
<td>Kabaena</td>
<td>Kulina, Hālawa</td>
<td>Lo’i</td>
<td>Ponged taro patch</td>
</tr>
</tbody>
</table>

3.1.4 Land Disputes of the 1800s

During the 1800s, the control of Hālawa Ahupua’ā was under dispute and ever-changing (Figure 11). The following discussion attempts to summarize this period of land disputes. Sometime after Kamehameha conquered O‘ahu in the battle of Nu‘uanu in 1795, he gave his most trusted foreign advisors, Isaac Davis and John Young, lands as a reward for their loyal service to him. As part of this award, each one received half of the ahupua’ā of Hālawa. As was the usual custom at the time, the king divided the land among his chiefs who supported him throughout his conquests of the islands (Klieger 1995:31, 36).

The lesser chiefs Isaac Davis and John Young were allowed to work the land as long as they lived. But, as was the traditional custom, upon their death the land reverted back to the ali`i nui or paramount chief. This rule held true even for these two most faithful advisors.

Figure 11. Summary of land disputes in Hālawa Ahupua’a (Klieger 1995:50)

Klieger (1995:38-44) notes that when Isaac Davis died in 1810, the lands under his supervision appear to have been transferred back to Kamehameha I, who likely transferred them to Oliver Holmes. Upon Oliver Holmes’ death in 1825, they were probably returned to Lilolihio (Kamehameha II) who redistributed them after Holmes’ death. Holmes’ children did not claim any Hālawa lands in the Mīhele, although his son, George Holmes, was awarded a piece of land in Honolulu (LCA 1045). It is this period from 1825 to 1848 that is most unclear.

In 1848, Hālawa Ahupua’a was awarded jointly to Grace Kama‘iku‘i Young Rooke and Kekāka‘anāo (LCA 8516B and 7712) (Klieger 1995:41). Kekāka‘anāo ended up with Davis’ Hālawa portion and Grace Kama‘iku‘i Young Rooke (John Young’s daughter) retained the John Young portion. Isaac Davis’ portion of Hālawa passed from Kekāka‘anāo to Ruth Ke‘elekolani and on to Bernice Pauahi Bishop. Upon Ruth’s death, her lands became part of the Bishop Estate Trust (Klieger 1995:38–40, 44, 46).

John Young tried to make his lands inheritable by requesting that his children, and those of Isaac Davis whom he had adopted, be allowed to retain the lands given to him by the king upon his death. Specifically, he attempted to will Hālawa to his daughter, Grace Kama‘iku‘i. His will states,

[…] in behalf of my deceased friend Isaac Davis and for his children as he died without will, the King Kamehameha gave me all the said Isaac Davises [Davis’] lands to take care of them and his children until the children came of age, and now they are come of age so I think it right to leave my last wishes and will that the King, Ka‘ahumanu, Adams and Rooke and all the Chiefs will let Isaac Davises children keep their father’s lands that King Kamehameha gave to him as a reward for assisting the King in his wars in conquering the islands of Hawai‘i, Mau, Molokai, and O‘ahu, and which we have an undoubted right to leave to our children, which I hope in God our young king will fulfill the wishes of his honored father. My own lands, I wish my children to enjoy as I have done, likewise my wife […]

[Claim 5: #595 F.R. 67–72 V2]
Kamehameha III refused to honor Young’s request upon his death (Kame‘eleeahiwa 1992:59–60). However, in the Māhele, John Young’s children were allowed to keep lands as ‘āina ho ‘ōlima or inherited lands. Likilikā Kame‘eleeahiwa (1992:59–60) notes that in all of the Bake Māhele, these were the only lands given under this designation.

In 1852, Kekānānā’a wrote a letter to the Minister of Interior requesting that a list of the kapu (forbidden) fish for Victoria Kamānālua’s lands on O‘ahu be published in the newspaper. The kapu fish for Hālawa was the ‘ūnae or full-sized mullet (Kekānānā’a 1852: August 12).

In 1862 the Mataio Kekānānā’a and Kama‘iku‘i Rooke (John Young’s daughter) leased a portion of the ahupua’a of Hālawa to a Manuel Paiko of Honolulu for the purpose of cattle ranching (Bureaus of Land Conveyance 1862, Liber 9:174–179).

In 1866, Kama‘iku‘i willed to her sister, Fanny Na‘ea, her interest in her portion of Hālawa (Klieger 1995:40).

In 1879, Fanny gave her interest of Hālawa to her daughter, Emma Kaleleonalani Na‘ea Rooke, Queen of Kamehameha IV, by way of a deed (Klieger 1995:48), which stated, […] the undivided ½ interest of and in to the Ahupua‘a of Hālawa situate in ‘Ewa, Island of O‘ahu, and more fully described in Royal Patent 6717 to Grace Kamaikui and being the same premises devised to me the said Fanny Young Kaleleonolani by the said Grace Kamekameka. [Bureau of Land Conveyance 1879, Liber 59:283]

Fanny died one year later in 1880. A listing of konohiki (“Headman of an ahupua‘a land division under the chief”), Pakui and Elbert 1886:153) lands on the island of O‘ahu reflects the joint tenancy of Hālawa. Both Ruth Ke‘elikolani and Queen Emma are listed as owners. The document also lists the lands on O‘ahu that abut the ocean, including the length and whether the land is a lagoon, reef or open sea. The length of the land abutting the sea at Hālawa is 8.52 miles and listed as being a reef or lagoon (Interior Department Letters 1878–1879). Five years later, Queen Emma died in 1885, leaving no heirs. All of her lands became part of the Queen Emma Trust (Klieger 1995:48–49).

Between 1848 and 1888 there seems to have been dispute over the joint tenancy of Hālawa between the families of Kekānānā’a and Young (Klieger 1995:43). In 1888, after a new survey was completed, The Supreme Court of the Kingdom of Hawaii under Sanford B. Dole settled the matter by giving the northern portion of Hālawa to the Bernice Pauahi Bishop Estate and the southern portion to the Queen Emma Trust (see “Queen Emma Estate” on Figure 10) (Klieger 1995:50). From this time on, the boundaries have been distinct, and the two portions recognized independently of each other.

3.1.5 Mid- to Late 1800s

From early visitor descriptions of Hālawa and ‘Ewa, one can already begin to see that by the 1820s the demographics and landscape had changed considerably. Where once the area was heavily populated and highly productive, by the 1820s the population had dwindled and there were fewer villages and areas under cultivation.

By 1850, three years after the Māhele, the census for O‘ahu was 25,440, a decline of 14.5% over 18 years. This population decline has been attributed to several factors including disease, high infant mortality, and low fertility rates due to sexually transmitted diseases (Schmitt 1973:15). The decline also is probably due to people moving away from rural areas and closer to Honolulu, which was the center of trade and economic activity. On the island of O‘ahu, a decrease in the population statistics is seen almost yearly until 1884, when the figures show an increase from then on into the twentieth century (Schmitt 1977:11). The increase is probably related in part to the growth of the sugar industry and the imported labor that was needed to work the plantations.

The first Chinese laborers arrived in Hawaii in 1852 under contract to work on sugar plantations. As the demand for kalo declined and importation of Chinese laborers to the west coast of California and Hawaii increased, a market for rice developed. Lo‘i lands were ideal for growing rice, and as these lands lay in disuse and became more available, the Chinese farmers snatched them up. Most of the land was “near sea level—undrained areas at the mouths of streams: lowlands, which could be reclaimed without great expense” (Coulter and Chum 1937:11). The Royal Hawaiian Agricultural Society encouraged rice as a new crop. The first rice harvest occurred in 1862. By the mid-1860s, much of the lo‘i on O‘ahu had been transformed into rice fields. By 1892, there were about 117 acres of land planted in rice in the lowlands of Hālawa (Coulter and Chunn 1937:21).

In many ahupua‘a, the lands not claimed by kuleana claimants were leased out to entrepreneurs who started ranching and sugar plantations on a large scale (Klieger 1995:71). Such was the case with Hālawa. In 1862, Kama‘iku‘i Rooke and Mataio Kekānānā‘a leased much of Hālawa to a Manuel Paiko, a Portuguese rancher (Klieger 1995:76). The lease document reads that the boundaries begin at “a small brook which forms the boundary between Hālawa and Moanalua” and continue “along the ridge of the mountain bordered on the north by ‘Asea and Kalauloa, and on the west by Ko‘olau, to the top of a peak called Alohoe; which forms the boundary between Moanalua and Hālawa.” The leased area consisted of about 10,000 acres. However, excluded from the lease was the “sea, the lagoons, the fish and all ponds, the enclosed kalo lands, all kuleana awarded by the Land Commission, and so much of the kula lands adjoining the pond Ka Waiako.” The lease was taken out for 15 years with a rent of $500 per year (Bureau of Land Conveyance, Liber 9:174–179). Manuel Paiko took on a business partner, James Dowsett of ‘Uulaulaka‘u Ranch farm By 1870, their herd consisted of 1,400 head (Bureau of Land Conveyance, Liber 9:293).

James Dowsett and another partner, J.R. Williams also attempted to raise sugar in the Hālawa area. Due to lack of a railroad to haul cane and the mill burning down three times, they gave up trying to raise sugar in 1875. Altogether, about 100 acres had been planted in cane (Condé and Best 1973:327).

Maps from the late 1800s (Figure 12 through Figure 14) indicate the current study area was relatively undeveloped with portions of the lands used for rice and sugarcane cultivation. An 1873 Lyons map of Pearl Lochs (see Figure 12) shows a road connecting the short-lived Dowsett and Williams “Hālawa Mill” with a boat landing that was presumably used for the exporting of sugar prior to the railroad connection. That main “road” crossed the southern portion of the large stadium parcel on the south side of Hālawa Stream. The project area is primarily in an area described as rice fields and shows some other agricultural fields. There is no evidence of an active fishpond or cultivation in this immediate area at that time. Active cultivation is shown on both sides of Hālawa Stream within the south portion of the large stadium parcel. A comparison of the 1873 map (see Figure 12) with the 1888 map (see Figure 14) helps us understand how extensive these 1888 rice lands were (a maka‘u extension of the “Kalo Land” is shown downstream on the 1888 map).
Figure 12. Portion of an 1873 Lyons map of Pearl Lochs and Puuola Entrance (RM 1639) showing the overlay of the project area in relation to the agricultural fields.

Figure 13. Portion of a 1874 Lyons map of Aiea (RM 323) showing the overlay of the project area in relation to the agricultural fields.
Notably several fishponds in the general vicinity are clearly indicated on the 1873 (see Figure 12) and 1888 maps (see Figure 14) in a manner suggesting they were still active but the locations of the former Pu‘u‘ene Kalokoloa Fishpond and Pu‘u‘ene Kaualao Fishpond, previously bracketing the mouth of Hālawa Stream are identified as “mudflats” (see Figure 12). The 1873 map (see Figure 12), 1874 map (see Figure 13), and 1888 map (see Figure 14) all show fishponds but it seems clear they are actively being silted in or are otherwise going out of production in this timeframe.

Both the 1873 map (see Figure 12) and the 1874 map (see Figure 13) show the main cross-island “Road to Honolulu” trail as well mauka (inland) of the project area but they both show a less formal coastal trail arcing through three of the project areas. The development of the Oahu Railway along the coast of Hālawa (Figure 15) in the 1890s opened up the Hālawa lands to commercial sugarcane production and the organization of the Honolulu Sugar Company, soon the Honolulu Plantation Company in 1899 by San Francisco investors (Dorrance and Morgan 2000:50). The Beasley map of 1899 shows no development in the vicinity of the project area other than the Oahu Railway. The “Hālawa Station” is indicated by a small circle on the rail line just north of the mouth of Hālawa Stream, immediately north of which the railway splits with the main route clinging to the coast and another route arcing more to the east through the project areas and then splitting again in the large stadium parcel. The main road, labeled as the “Government Road” is now shown as skirting the north edge of the large stadium parcel.

Klieger indicates two of the LCA parcels (LCA 2156:1 and LCA 2156:2) in the large stadium parcel previously belonging to Opanui became part of the Hālawa Camp of the Honolulu Plantation Company (labeled “Honolulu Plant Co” on Figure 10). While not completely clear, these appear to have been areas developed where,

To help secure a stable labor pool, the Honolulu Plantation Company established an independent homestead program in 1902, whereby individual laborers could receive personal use of land on company property in exchange for their continued employment commitment.” [Klieger 1995:82]

Following the Spanish-American war was a time of shifts in labor supply and the indication is these Honolulu Plantation Company resident workers were more likely to be from the Azores, Madeira or Puerto Rico (Klieger 1995:82). A look forward to the 1919 U.S. Army map (see Figure 19) suggests that quite a number of plantation worker households were established along Hālawa Stream in the project area and also along a roughly parallel road to the north in this 1898–1919 period.

3.1.6 The Early Twentieth Century and the Rise of the Honolulu Plantation Company

At the end of the nineteenth century, the Honolulu Sugar Company (organized in 1899, renamed the Honolulu Plantation Company by 1906; compare Figure 16 and Figure 17) began leasing 6,500 acres around Pearl Harbor for sugarcane cultivation (Dorrance and Morgan 2000:50). By the mid-1930s, the company had more than 23,000 acres of land leased, having expanded significantly up the coastal plain to the north inland of the East Loch of Pearl Harbor (Figure 18). Sugarcane planting extended quite far seaward, but the Donn map indicates the small coastal floodplain of Hālawa Stream was in rice production ca. 1906 (see Figure 17).

Figure 14. Portion of 1888 Monsarrat map of Hālawa (RM 1687) showing the overlay of the project area in relation to the agricultural fields.
Figure 15. Portion of a 1899 Beasley Hawaiian Government Survey map of O‘ahu showing the project area.

Figure 16. Portion of a 1900–1925 map of the property of Honolulu Sugar Company (RM 2643) showing the project area.
The 1900–1925 map of the property of Honolulu Sugar Company (see Figure 16) shows much of the west portion of the project areas as within “Field 2” and much of the east portion of the large stadium parcel as within seed cane plantings (on both sides of Hālawa Stream).

Historic maps show the development of Honolulu Plantation in the vicinity of the project area. The Donn 1906 map of Oahu (see Figure 17) appears to show the Honolulu Plantation fields encompassing the entire project area. To the west of the southern portion of the project area is an area marked as “wet lands (rice and taro).” No other development is indicated in the vicinity, other than the Oahu Rail & Land (OR&L) railroad, which runs very close to the eastern margin of Pearl Harbor, and the main government road skirting Pearl Harbor further inland.

A map of the Honolulu Plantation Company (Figure 18; no date) shows the layout of the plantation fields and infrastructure. The low assigned field numbering within the project area (Fields 1, 10, and 13) and the proximity to the mill, 600 m northeast of the project area (see Figure 12) suggests the project areas may have been within some of the earliest developed sugarcane fields (ca. 1900).

The 1919 U.S. War Department map (Figure 19) shows (faintly) sugarcane symbols throughout the project areas with a somewhat complicated layout of roads and railroads crossing the large stadium parcel. Of particular note are the numerous houses in the central east side of the large stadium parcel believed to relate to an “independent homestead program” of the Honolulu Plantation Company established in a former Hawaiian LCA cluster. There is an array of houses along Hālawa Stream (and a parallel road) within the large stadium parcel with another array of houses just to the north near a railroad and road crossing within the large stadium parcel. Approximately 19 houses are indicated within the project areas on this 1919 map.

The Honolulu Plantation Company operated from 1899-1947 with peak production achieved in 1928 and with the refinery (sold to the California & Hawaiian Sugar Company in 1947) continuing operation until 1996 (Dorrance and Morgan 2000:41, 50). A 1933 Land Court Application (see Figure 21) provides detail regarding the south portion of the large stadium parcel showing approximately 16 rectangular buildings south of Hālawa Stream within the parcel. These are understood as plantation workers’ homes. About half of this camp was adjacent (outside) to the project area to the east.

3.1.7 A Note About ‘Aiea Cemetery

The northwest edge of the large stadium parcel lies quite close to the ‘Aiea Cemetery, established ca. 1900 by the Honolulu Plantation Company as a burial ground for the plantation community in the area. A former caretaker “estimated that as many as 3,000 people were buried at Aiea Cemetery” (Pang 2002). The graveyard was originally approximately 2.5 acres located on a bluff overlooking Pearl Harbor (Figure 20). However, in order to make way for Kamehameha Highway, graves within this mauka section “were reinterred on the makua side” (Pang 2002). As testified by a long-time area resident of ‘Aiea, during the construction of the highway “all those who were being affected by the road, we had to go and get our bones or whatever was buried” (Higuchi 2003:11). An HDOT 1933 engineering plan map of the development of Kamehameha Highway appears to outline the former extent of the cemetery and also notes that 414 graves within ‘Aiea Cemetery were located within the right-of-way of the highway (Figure 22). Presumably these graves within the right-of-way were among those relocated to the makua section.

Figure 17. Portion of 1906 Donn Hawaii Territory Survey map of Oahu with land use (RM 2374) showing an overlay of the project area location
Figure 18. Map of the Honolulu Plantation Company (Condé and Best 1973:331) showing an overlay of the project area location

Figure 19. Portion of 1919 Pearl Harbor U.S. Army War Department fire control map showing an overlay of the project area location showing branching roads and railroads and numerous houses in the central east side of the large stadium parcel believed to relate to an “independent homestead program” of the Honolulu Plantation Company established in a former Hawaiian LCA cluster
Figure 20. Portion of the 1921 Newton and Chaney Aina Makai map (RM 2677) showing the 'Aina Cemetery on a pronounced bluff—the makai (southwest) portion of which is eventually removed by a military activity and Kamehameha Highway construction (from Sroat et al. 2012:227)

Figure 21. Portion of 1933 Land Court Application 966, Map 2 showing south portion of the project areas with approximately 16 buildings south of Hālawa Stream on the southeast side of the large stadium parcel (there was almost certainly another grouping of houses within the large stadium parcel near the north edge of this map that is not shown)
Figure 22. Close-up of 1933 HDOT engineering plan map of the development of Kamehameha Highway, showing what appears to be the area of ‘Aiea Cemetery, the existence of approximately 414 graves in the highway right-of-way, and the grading profile of the highway relative to the previous land; note the significant difference between the “Finished Grade” and “Profile Ground” (1933 Hawai‘i Department of Transportation engineering plans for the development of Kamehameha Highway, Map 4300.10) (from Sroat et al., 2012:228)

Figure 23. Portion of the 1935 Waipahu U.S. Army War Department terrain map showing the project areas with branching roads and railroads and approximately 18 buildings on the central east side of the large stadium parcel
The construction of Kamehameha Highway in the 1930s bisected the bluff on which ‘Aiea Cemetery was located, creating a severe road cut which allowed the new highway to remain on relatively level ground (see Figure 22 and Figure 23). As shown in the 1933 HDOF engineering plan map (see Figure 22), the road cut consisted of an approximately 7.3-m (24-ft) deep slice through the bluff. A 1939 aerial photograph (see Figure 24), shows Kamehameha Highway cutting through the coastal bluff on which ‘Aiea Cemetery was located. The 1935 U.S. Army map (see Figure 23) captures the situation at that time with the new highway effectively cutting through the cross symbol denoting the cemetery. The makai section of the bluff was later leveled with the roadway.

Given the substantial disturbance to the area, the continued existence of any ‘Aiea Cemetery burials outside of the presently established cemetery appears low.

3.1.8 Mid-Twentieth Century

The 1935 U.S. Army map (see Figure 23) shows the project areas with branching roads and railroads and approximately 18 buildings on the central east side of the large stadium parcel. This is very similar to the depiction of 26 years earlier (see Figure 19) with an array of houses along Hālawa Stream (and a parallel road) on the central east side of the large stadium parcel with another array of houses just to the north near a railroad and road crossing within the large stadium parcel. Approximately 18 houses are indicated within the project areas on this 1935 map.

A 1939 aerial photograph (see Figure 24) confirms the situation thought to have existed since ca. 1900 where almost all of the four parcels appear to be under sugarcane cultivation. Two residential communities are shown along the central east side of the large stadium parcel along two roughly parallel roads.

The 1943 U.S. Army War Department map (Figure 25) depicts a much different world understood as resulting from U.S. military activity during World War II. Comments below address the area by project area parcel:

- Parcel 055, the small crescent-shaped parcel south of the curve of Salt Lake Boulevard appears to be unaffected by World War II developments to that time but the bounding roads on the northwest and southeast sides are in place (see Figure 25).
- Parcel 061, the large stadium parcel, is largely unchanged in the southern 2/3, but the northern 1/3 is covered with approximately 39 new (on average, quite large) buildings and new roads (see Figure 25).
- Parcel 070, the narrow strip parcel on the southeast side of Kamehameha Highway, appears to have two new large buildings parallel to Kamehameha Highway (see Figure 25).
- Parcel 071, the trapezoidal parcel bound by Kamehameha Highway to the northwest, and legs of Salt Lake Boulevard, appears to be covered with approximately 19 new, large buildings (see Figure 25).

The nature of these new military buildings shown on the 1943 U.S. Army War map (see Figure 25) is unclear but they are assumed to include warehouses and office space. Many of these World War II buildings were very quickly erected and also very quickly demolished following the war. The 1952 aerial photograph (Figure 26) provides a clear image of the military constructions and shows a layout very similar to that of the 1943 map (see Figure 25) with seemingly a few additional
Figure 25. Portion of a 1943 Aiea U.S. Army War Department terrain map showing project area.

Figure 26. 1952 USGS aerial photograph (UH MAGIS) showing project area.
buildings likely constructed in the last years of the war. The majority of the large stadium parcel is still in sugarcane cultivation. The area of plantation housing along Hālawa Stream appears to be done or diminished while the strip of plantation housing to the north seems to still be in place. The depiction in the 1953/1954 USGS map (Figure 27) suggests that almost all of the plantation and World War II structures had been swept away but this appears to be just a case of the USGS now using a pink shading to indicate urban areas and only selectively showing some buildings. The 1953/1954 USGS map (see Figure 27) depicts a very large World War II building with nine wings in the north central portion of the large stadium parcel and a smaller, probable World War II-era structure remains near the west corner of the large stadium parcel. A fire station is depicted in the north central portion of the large stadium parcel and this may have been a holdover from World War II constructions as well. Many roads are shown in the northwest portion of the project areas. There appear to be two new small structures in the large stadium parcel just northwest of Hālawa Stream.

The 1968 USGS map (Figure 28) shows only four buildings in the project areas but again this appears to be a misleading result from the USGS using a pink shading to indicate urban areas and only selectively showing some buildings. The large World War II building with nine wings in the north central portion of the large stadium parcel is now the “Hālawa Kai School” located on the north side of “Hale Street.” Hale Street, effectively forming a shortcut between Kanehameha Highway and Moanalua Road, is first depicted on the 1943 map (see Figure 25) and ran through the middle of the future stadium for 45+ years until the creation of the present Aloha Stadium. The 1968 USGS aerial (Figure 29) shows that in fact, the majority of the World War II buildings within the project areas were still intact at that time.

3.1.9 Aloha Stadium

Aloha Stadium officially opened on 12 September 1975. A selection of photographs (Figure 30 through Figure 32) of the ongoing construction indicates huge cuts to level the site and massive ground disturbance over much of the parcel. The land and the stadium are owned and managed by the State of Hawai‘i. The stadium has the current capacity to hold a maximum of 50,000 people and includes an 8,000-car parking lot. A variety of events including football, baseball, soccer, boxing, religious and music festivals, swap meets, auto shows, motocross, mud races, tractor pulls, concerts, and carnivals have taken place there over the years.
Figure 30. Photograph of the original development of the Aloha Stadium (Aloha Stadium 2019)

Figure 31. Photograph of the original development of the Aloha Stadium (Aloha Stadium 2019)

Figure 32. Photograph of the original development of the Aloha Stadium (Aloha Stadium 2019)
3.2 Previous Archaeological Research

Previous archaeological studies in the vicinity of the project area are depicted in Figure 33, summarized in Table 2, and discussed in detail below. Previously identified historic properties in the vicinity of the project area are depicted in Figure 34 and are summarized in Table 3.

3.2.1 Early Archaeological Research at Hālāwa

The first recorded sites at Hālāwa were documented during the pioneering attempt at a comprehensive survey of archaeological sites on the island of O‘ahu by J. Gilbert McAllister of the Bishop Museum in 1930. McAllister (1933:101–102) recorded ten historic properties (nine coastal fishponds and Ford Island—known to the Hawaiians as Moku‘ume‘ume) within Hālāwa Ahupua‘a, giving their approximate locations and describing their conditions at the time of the survey. The historic properties in the vicinity of the project area include the following:

Site 101. Makalapa Crater

Makalapa Crater, now being used for a freshwater pond. Believed to be recent. [McAllister 1933:102]

Makalapa Crater lies just south of Hālāwa Stream (the crater rim is about 300 m east of the Kamehameha Highway alignment).

Site 102. Loko Kunana and Loko Mulawai, between Hālāwa and Kuahua Island.

Kunana has been partly filled in but was formerly 25 acres in extent. Kuahua island forms one side and the opposing wall is formed Hālāwa. The two walls running between the land and the island are 1800 feet and 1950 feet long, about 5 feet wide, and 3 feet high. Loko mulawai is only 4 acres in extent, a portion of which has been filled. Its wall is 500 feet long with one outlet (mākahā). [McAllister 1933:102]

Loko Kunana and Loko Mulawai lie adjacent to the east side of the East Loch of Pearl Harbor, just south of Hālāwa Stream.

Site 104. Kahakupohaku pond, near the Aiea Railroad Station.

A small pond of 3 acres with a semicircular wall of evenly spaced basalt 1050 feet long, 5 feet wide, 3.5 feet high, without outlet gates (mākahā). The name is also spelled ‘Kahakapohaku’ and ‘Kakupohaku.’ [McAllister 1933:102]

Loko Kahakupohaku, the nearest of the McAllister sites to the current project area, was located 150 m west of the project area on the coast.

Site 108. Loko Piaiau, fishpond at Kalauao.

Rectangular in shape, roughly 190 by 600 feet, surrounded by land on three sides. The wall on the harbor side is 3 to 4 feet wide, 2 feet high with one mākahā. The three sides toward the land have been evenly faced with water worn basalt to a height of about 2 feet. The pond was evidently fed by the water from the surrounding taro patches. Tradition credits its construction to Kalaimanuia.

Loko Piaiau was located 1 km northwest of the project area on the coast.
<table>
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<th>General Location</th>
<th>Results</th>
</tr>
</thead>
<tbody>
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<td>McAllister 1933</td>
<td>Island-wide survey</td>
<td>O‘ahu Island</td>
<td>Site 101 Makalapa Crater, Site 102 Loko Kanna and Loko Mulwai, and Site 104 Loko Kahakulono, Site 108 Paiau, and Site 109 Loko Opu; Survey focused around vicinity of Saratoga Dr; surface survey identified one possible heiau, one historic house platform, a stone wall, and several burial structures (two family plots, three mounds, one concrete enclosure); subsurface excavations of possible heiau structure inconclusive; finds subsequently designated SHP # 50-80-09-5306</td>
</tr>
<tr>
<td>Cluff 1970</td>
<td>Archaeological survey</td>
<td>Hilawa Interchange with H-1 Freeway</td>
<td>Possible heiau structure identified; notes disturbance to entire Hilawa portion of study area</td>
</tr>
<tr>
<td>Barrera 1971</td>
<td>Archaeological</td>
<td>Proposed Honolulu Stadium</td>
<td>Proposed Honolulu Stadium</td>
</tr>
<tr>
<td>Yett and Ota 1981</td>
<td>Archaeological</td>
<td>31.0-acre area around margins of Aiea (&quot;Rainbow&quot;) Bay</td>
<td>No historic properties identified; notes presence of abandoned piers, pilings, trash, and LST (Landing Ship Tank) site at tip of McGrew Point</td>
</tr>
<tr>
<td>Sinoto 1986</td>
<td>Archaeological</td>
<td>Proposed Pearl Promenade, TMKs: 1] 9-8-014:003, 9-8-001:007, 9-8-015:044, 045</td>
<td>Surface survey identified no historic properties; noted area was former marshlands with modern bulldozer-related disturbance</td>
</tr>
<tr>
<td>Davis 1990</td>
<td>Literature review</td>
<td>Proposed terminus for Ford Island Causeway and Ford Island</td>
<td>No historic properties identified</td>
</tr>
<tr>
<td>Avery et al. 1994</td>
<td>Archaeological</td>
<td>Kamehameha Hwy from Aloha Stadium to Makalapa Gate</td>
<td>No historic properties identified; data developed about environmental change in vicinity of mouth of Hālawa Stream, including changes in vegetation and course of stream</td>
</tr>
<tr>
<td>Hammat and Wineski 1994</td>
<td>Archaeological</td>
<td>SE of Aloha Stadium</td>
<td>No historic properties identified; notes major impact of commercial sugar cultivation</td>
</tr>
<tr>
<td>Source</td>
<td>Type of Investigation</td>
<td>General Location</td>
<td>Results</td>
</tr>
<tr>
<td>Napoka 1994</td>
<td>SHPD determination of historic significance</td>
<td>Pōhaku O Kī’i Nalopaka Place, 'Aiea</td>
<td>Storied boulder designated SHP # 50-80-09-4892, traditional cultural property</td>
</tr>
<tr>
<td>Williams 1994</td>
<td>Archaeological</td>
<td>Pearl Harbor NAVBASE, Kūkana and Wailolowi Fishponds</td>
<td>No additional historic properties identified; conducted within Kūkana Fishpond, core indicated fishpond sediments and radiocarbon analysis dated pond construction between AD 1200 and AD 1400</td>
</tr>
<tr>
<td>Erkelens 1995</td>
<td>Archaeological</td>
<td>Ford Island Golf Park and Rainbow Marina, East Loch of Pearl Harbor</td>
<td>No historic properties identified</td>
</tr>
<tr>
<td>Dye 1999</td>
<td>Archaeological</td>
<td>Kamehameha Hwy at Hālawa Bridge</td>
<td>No historic properties identified; major twentieth century landscape modifications to vicinity noted</td>
</tr>
<tr>
<td>Athens et al. 2000</td>
<td>Archaeological</td>
<td>Ancient Hawaiian fishponds of Pearl Harbor on U.S. Navy Land</td>
<td>No additional historic properties identified; includes dating analysis for several fishponds in vicinity: Loko Pōhaku, Loko Wailoliokoi, Loko Wailohowai, Loko Muliwai, Loko Kunana</td>
</tr>
<tr>
<td>Cochrane and Athens 2000</td>
<td>Archaeological</td>
<td>Pearl Harbor, near Magazine Loch between Hurt Ave and Kaahua Ave</td>
<td>No historic properties identified</td>
</tr>
<tr>
<td>Hunkin and Hammat 2008</td>
<td>Archaeological</td>
<td>4380 Lawehana St</td>
<td>No historic properties identified</td>
</tr>
<tr>
<td>Altizer et al. 2009</td>
<td>Archaeological</td>
<td>'Aiea Intermediate School erosion control project, TMK: 1] 9-8-005:001, 30.8-acre campus including a 150-ft portion of 'Aiea Stream corridor</td>
<td>No historic properties identified within project area and no further archaeological work recommended</td>
</tr>
<tr>
<td>Source</td>
<td>Type of Investigation</td>
<td>General Location</td>
<td>Results</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------</td>
<td>----------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sroat et al. 2012</td>
<td>Archaeological inventory survey</td>
<td>Phase 2 of Honolulu High-Capacity Transit Corridor Project extending along Kamehameha Hwy</td>
<td>Identified one historic property, SIHP # 50-80-09-7150, lo ‘i deposits (not in vicinity of current project area); southernmost AHS test excavation “E-26” near current project area documented current road surface and base course overlying natural deposits with no evidence of past land utilization or modification</td>
</tr>
<tr>
<td>Hammatt et al. 2013</td>
<td>Archaeological inventory survey</td>
<td>Kamehameha Hwy from Kalaloa Dr to Middle St</td>
<td>Documented two newly identified historic properties: SIHP # 50-80-13-7420 (buried asphalt roadway sections, possibly early Kamehameha Hwy alignment) and SIHP # 50-80-13-7421 (buried concrete slabs, prepared coral pavement, and underlying associated base course, likely remnants of military infrastructure ca. 1942-1943)</td>
</tr>
<tr>
<td>Murabayashi et al. 2013</td>
<td>Literature review and field inspection</td>
<td>Proposed VZW HON Red Hill Telecom Facility at 99-611 Uluene St in Hālawa</td>
<td>No historic properties identified; noted area heavily disturbed and modified over time</td>
</tr>
</tbody>
</table>

Figure 34. Portion of a 1998 Waipahu and 1999 Pearl Harbor USGS topographic quadrangles with overlay of previously identified historic properties in the vicinity (within approximately 1 km) of the project area.
Table 3. Previously identified historic properties in the vicinity (within approximately 1 km) of the project area

<table>
<thead>
<tr>
<th>SHIP #</th>
<th>Type</th>
<th>Reference</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>McAllister Site 101</td>
<td>Fishpond, Makalapa Crater</td>
<td>McAllister (1933:102)</td>
<td>Lake within crater</td>
</tr>
<tr>
<td>McAllister Site 102</td>
<td>Fishpods, Loko Kunana and Loko Muliwai</td>
<td>McAllister (1933:102)</td>
<td>Loko Kunana: Kuahua Island forms one side, walls from shore to island are 1,800 ft and 1,950 ft long, approx. 5 ft wide and 3 ft high. Loko Muliwai: Wall 500 ft long with one mākahā.</td>
</tr>
<tr>
<td>McAllister Site 104</td>
<td>Fishpond, Loko Kahakupono</td>
<td>McAllister (1933:102)</td>
<td>Small pond of 3 acres with a semicircular wall of evenly spaced basalt 1.050 ft long, 5 ft wide, 3.5 ft high, without outlet gates (mākahā); name also spelled “Kahakupohaku” and “Kakupohaku”</td>
</tr>
<tr>
<td>McAllister Site 108</td>
<td>Fishpond, Loko Paiau</td>
<td>McAllister (1933:103)</td>
<td>Rectangular in shape, roughly 190 by 600 feet, surrounded by land on three sides. The wall on the harbor side is 3 to 4 feet wide, 2 feet high with one mākahā. The three sides toward the land have been evenly faced with water worn basalt to a height of about 2 feet. The pond was evidently fed by the water from the surrounding taro patches. Tradition credits its construction to Kalaimanua.</td>
</tr>
<tr>
<td>McAllister Site 109</td>
<td>Fishpond, Loko Opu</td>
<td>McAllister (1933:103)</td>
<td>Has not been completely filled in. It was 10.5 acres in size and apparently completely surrounded by a wall 2700 feet in extent. It was built by Kalaimanua.</td>
</tr>
<tr>
<td>1356</td>
<td>USS Bowfin (SS-287)</td>
<td>National Register</td>
<td>Submarine used during World War II at Pearl Harbor.</td>
</tr>
<tr>
<td>1384</td>
<td>Commander-in-Chief of the Pacific Fleet (CINCPAC FLT) Headquarters</td>
<td>National Register</td>
<td>–</td>
</tr>
<tr>
<td>4892</td>
<td>Pōhaku O Ko’i Naupaka Place, Aiea</td>
<td>Napoka 1994</td>
<td>A storied boulder with a legend related to <em>luau hula</em> John Kaimikaua.</td>
</tr>
</tbody>
</table>
Site 109. Loko Opu, fishpond at Kalauao.

Has not been completely filled in. It was 10.5 acres in size and apparently completely surrounded by a wall 2700 feet in extent. It was built by Kalaimaua.

Loko Opu was located approximately 1.1 km northwest of the project area on the coast.

3.2.2 Recent Archaeological Research in the Vicinity of the Project Area

3.2.2.1 Cluff 1970

Deborah Cluff (1970) of the Department of Land and Natural Resources (DLNR) reported on an archaeological survey for the proposed Hālawa Interchange with the H-1 Freeway. The archaeological survey arose from concerns of community members who described numerous graves within the area, including family graves. As the majority of the area encompassed previous cane field lands, the survey concentrated along the immediate vicinity of the southeast side of a road called out as “Saratoga Drive” (see Figure 35 for the Cluff 1970 survey area and SHIP # 50-80-09-5306 feature location map, Figure 33 to see how the Cluff project area relates to the present project areas, and Figure 34 to see how the designated historic property SHIP # 5306 relates to the present project areas). Eight historic properties were identified, including historic grave structures and one stone house platform. Residents of the area also noted a heiau known to have been in the vicinity. Cluff identified a possible heiau structure (Designated Feature 1) and conducted subsurface excavations; however, the function of the structure remained indeterminate. Feature 2 was “a composite of several historic remains” (Cluff 1970:16) including a concrete slab overlying a stone paving, understood as a former road used as a plantation worker’s house platform. Feature 3 was a stone wall in two sections. Feature 4 comprised of three irregular stone mounds posted as a former grave. Feature 5 was a concrete enclosure posted as a possible burial. Feature 6 was “a burial plot belonging to a family presently [1970] living nearby” (Cluff 1970:19). Feature 7 was “a family burial plot belonging to the family occupying the adjacent house—the same owners of Feature.” (Cluff 1970:19). Hence four of the seven designated features of SHIP # 5306 were posted to be burials. Six tombstones from within SHIP # 5306 Feature 7 are depicted in the Cluff study (see present Figure 36). Five of the death dates are between 1934 and 1940 and one is significantly earlier (1906). Four of the burials appear to have been Hawaiian and two to have been Portuguese. The death dates and the two Portuguese names fit the understanding that the houses on the south side of the designated “Saratoga Drive” that were the focus of Cluff’s study, and that continued into the east side of the large stadium parcel, relate to an “independent homestead program” of the Honolulu Plantation Company. The graves designated as SHIP # 5306 were only about 80 m east of the present project area (see Figure 34, Figure 35 and Figure 36).

3.2.2.2 Yent and Ota 1981

Martha Yent and Jason Ota (1981) examined an approximately 31-acre area around the margins of ‘Aiea (“Rainbow”) Bay extending from the (then) Ford Island ferry to the tip of McGrew Point for the proposed Rainbow Bay State Park project. They noted the prior presence of Kahakupahaku fishpond (McAllister Site 104) that was filled in and developed for a Navy firefighting school. It was noted that “The three areas under investigation underwent intensive modification by the Navy prior to and during World War II” (Yent and Ota 1981:12). The field survey noted the presence of abandoned piers, pilings, trash, and the Landing Ship Tank (LST) site at the tip of McGrew Point.
Point. The study did indicate the likely presence of subsurface cultural deposits associated with pre-Contact land use, specifically associated with aquaculture (i.e., fishponds). However, no historic properties were identified during the survey.

3.2.2.3 Sinoto 1986

In 1986, Aki Sinoto, then of the Bernice Pauahi Bishop Museum Department of Anthropology conducted an archaeological surface survey for a proposed Pearl Promenade development at the mouth of Kaluaau Stream and a portion of the former Loko Opa (McAllister Site 109; SIHP # 50-80-09-0109). It was noted that the fishpond was filled sometime prior to 1928. This infilling changed the topography of the land near Kaluaau Stream into marshlands with areas of fill, previous drainage alignments and dike construction. No historic properties were identified during the surface survey, and modern disturbance such as bulldozer push piles and modern trash were observed.

3.2.2.4 Davis 1990

The International Archaeological Research Institute, Inc. (IARI) (Davis 1990) reported on an archaeological literature review and field inspection of proposed developments at the U.S. Naval Base, Pearl Harbor that focused on a proposed terminus for a Ford Island causeway (that became the terminus for the Admiral Carey Bridge to Ford Island) and the southeast side of Ford Island. No historic properties were identified by the study.

3.2.2.5 Avery et al. 1994

Archaeological Consultants of Hawaii, Inc. (Avery et al. 1994) produced a study entitled "Paleoenvironmental Reconstruction Adjacent to the Mouth of Halawa Stream: Monitoring Report of the Waiau-Makalapa No. 2 138 kV Overhead Lines (Phase II). A series of 26 bore holes of varying depth were completed along the makai portion of Kamehameha Highway across approximately 800 m. No historic properties were encountered during the subsurface excavations of the bore holes, and the majority of the stratigraphy was culturally sterile. The properties within five boreholes P29 to P33 were in the vicinity of the present project area. For reasons that are not clear, "No information" was available for the two bore holes (Bore Hole 29 and Bore Hole 30) closest to Aloha Stadium (Avery et al. 199425). The results for the next closest three bore holes are described briefly below.

Bore Hole 31, located just south of the intersection of Salt Lake Boulevard and Kamehameha Highway, had a loam matrix with basalt rocks, angular gravel, and sub-rounded cobbles from the surface to a depth of 1.8 m below surface (mbs) and is referred to as a historic fill layer. From 1.8 mbs to 2.1 mbs was a clay loam layer and from 2.1 m to 3.3 m was a silty clay loam layer.

Bore Hole 32, located across Kamehameha Highway from the middle of the TMK: [1] 9-9-003:071 parcel, had the same loam matrix with basalt rocks, angular gravel, and sub-rounded cobbles from the surface to a depth of 2.1 mbs and is referred to as a historic fill layer. Tuff bedrock was encountered at 2.1 mbs.

Bore Hole 33, located west of the south end of TMK: [1] 9-9-003:071, had the same loam matrix with basalt rocks, angular gravel, and sub-rounded cobbles from the surface to a depth of 2.4 mbs and is referred to as a historic fill layer. Tuff bedrock was encountered at 2.4 mbs.

Figure 36. Tombstones of SIHP # 50-80-09-5306 Feature 7 (from Cluff 1970:22); five of the death dates are between 1934 and 1940 and one is significantly earlier (1906); four appear to have been Hawaiian and two to have been Portuguese.
The study explains that the upper layer in the stratigraphic column was historic fill (Layer I). This anthropomorphic deposit is of little interest (Avery et al. 1994:35).

Polln analysis from Avery et al. (1994) allowed for a recreation of the native ecosystem for the area at Bore Hole 39, located a kilometer southwest of the Stadium. According to the report, “The assemblage was dominated by *loula* (Pritchardia sp.) pollen” (Avery et al. 1994:50). The report concluded with the following:

Layer II, pollen zone B, represented a landscape significantly altered by human settlement inland. Pollen zone B reflected the vegetation communities which became established after more intensive use of the land in the lowland portion of Halawa watershed. The shell sample which dated to AD 890-1294 from this layer was collected near the base of this sediment. The land use changes inferred from the pollen record were most likely more recent than this date. [Avery et al. 1994:51]

3.2.2.6 Hammatt and Winieski 1994

In 1994, CSH conducted a reconnaissance survey for a proposed Hālawa Well just southeast of the Aloha Stadium (Hammatt and Winieski 1994). No historic properties were identified, and the study noted that all evidence of earlier activity was likely eroded by commercial sugarcane cultivation.

3.2.2.7 Napoka 1994

Nathan Napoka (1994) of the SHPD prepared a *Determination of Historic Significance of Pōhaku O Kiʻi State Site No. 50-80-09-489: A Traditional Cultural Property of Nalopaka Place, Aiea*. Napoka relates a legend, told to him by hula instructor John Kaimikaua, of a commoner named Kiʻi who loved a beautiful woman of chiefly rank and was given a task to make a lei of rare white lehua blossoms. He failed to return in the allotted time and was turned to stone. The story is associated with a boulder located near the ‘Aiea Post Office.

3.2.2.8 Williams 1994

Williams completed an end-of-fieldwork report (1993) and a final report (1994) on coring results of Kunana and Wainiowai ponds on the Pearl Harbor Naval Base. The cores in Wainiowai Pond were too shallow to expose fishpond sediments, and only one core in the Kunana fishpond area indicated fishpond sediments. Pollen and radiocarbon analysis of the Wainiowai Pond core indicated the pond was constructed sometime between AD 1200 and 1400. Seven sediment layers were analyzed using a Bayesian statistical approach to the integration of archaeological models and radiocarbon dates. The pollen data indicated contrasting indications of healthy or poor maintenance of the pond over time.

3.2.2.9 Erkelens 1995

Erkelens (1995) of IARI completed an archaeological study of the proposed Ford Island Golf Park and Saratoga Boulevard relocation for the Ford Island Bridge project. This was considered an addendum report for the Davis (1990) report on the Ford Island Causeway. Eight test excavations were completed for the study, documenting six stratigraphic layers. Layer VI consists of the coral reef over basal bedrock, while Layer V consists of a terrigenous sediment, the result of the slow silting of the Pearl Harbor Basin. Layer IV represented a re-deposition of marine material, possibly during a time of a short-term rise in sea level or a catastrophic storm.

Terrigenous sediments were again found in Layers I and II, during the infilling of the basin. Layer I was formed when the island was exposed above the water level. No historic properties were identified, and no artifacts were recovered from the test excavations.

3.2.2.10 Dye 1999

Thomas Dye (1999) completed a literature search for the Hālawa Bridge replacement project, which is near the former location of Kunana Pond. The archaeologists also conducted a pedestrian survey of the banks of the Hālawa Stream near the bridge. No historic properties were identified. Marine shell could be seen in the deposits, but Dye attributed the shell to tidal deposits rather than to cultural deposits.

3.2.2.11 Athens et al. 2000

In 2000, Steve Athens edited a report with several contributing authors for coring projects for 21 Pearl Harbor fishponds, including Loko Kunana and Loko Muliwai (collectively SHIP # 50-80-13-0102) a kilometer southwest of the current project area, Loko Kahakupōhaku immediately west of the present project area, and Loko Paiaiau, a kilometer northwest of the present project area.

It was concluded that Loko Muliwai, the more inland portion of the double fishpond designated by McAllister as Site 102, likely dates to AD 1540-1791 (Athens et al. 2000:25). Unfortunately, no field investigations were conducted at the fishpond closest to the present project, Loko Kahakupōhaku. “Due to possible hazardous waste contamination of the overlying fill” (Athens et al. 2000:31). A photo caption notes, “The lawn entirely covers the fishpond. Hazardous material is said to be in the fill” (Athens et al. 2000:32).

The study noted that Loko Paiaiau:

[... ] is one of the few in the Pearl Harbor area that is not covered by fill. There is about 1 m of standing water in the pond. The outer pond wall, except for its northeast section, appears mostly intact although overgrown with mangroves. [Athens et al. 2000:31]

The dating for this fishpond was problematic and the reason for error was unknown (Athens et al. 2000:42).

3.2.2.12 Cochrane and Athens 2000

IARI (Cochrane and Athens 2000) conducted archaeological monitoring for bilge and oily wastewater collection facilities near Magazine Loch, approximately 700 m southwest of the Hālawa View Apartments II project area. Limited trenching was undertaken in proximity to the former Loko Kunana fishpond (SHIP # 50-80-13-0102). Trenching did not exceed the depth of fill material, which extended to the base of excavation at 1.8 mbs.

3.2.2.13 Hankin and Hammatt 2008

CSH (Hunkin and Hammatt 2008) conducted archaeological monitoring for the Target/Bougainville redevelopment project at 4380 Lawehana Street. No archaeological deposits or historic properties were identified.
3.2.2.14 Altizer et al. 2009

CSH (Altizer et al. 2009) prepared a literature review and field inspection report for an `Aiea Intermediate School erosion control project (TMK: [1] 9-9-005:001). The study addressed the 30.8-acre campus including an eroded 150-ft portion of the `Aiea Stream corridor. No historic properties were observed within the project area and no further archaeological work was recommended for the proposed project.

3.2.2.15 Hammatt et al. 2013

CSH (Hammatt et al. 2013) conducted an AIS for the Airport Section (Construction Section 3) of the Honolulu High-Capacity Transit Corridor Project.

Two historic properties were identified, both at least 3 km south and southeast of the present project area including sections of buried asphalt roadway likely associated with an early alignment of Kamehameha Highway, or possibly another unidentified mid-twentieth century road (SHP # 50-80-13-7420) and buried concrete slabs, a prepared coral pavement, and underlying base course identified as probable remnants of warehouses and/or other infrastructure erected by the military in 1942-1943 (SHP # 50-80-13-7421).

3.2.2.16 Murabayashi et al. 2013

T.S. Dye & Colleagues, Archaeologists, Inc. (Murabayashi et al. 2013) completed a literature review and field inspection for a proposed VZW HON Red Hill Telecommunications Facility at 99-611 Uluone Street in Hālāwai. No historic properties were identified, and the study concluded that the area has been heavily modified by urban development and the installation of the existing telecommunications facility, suggesting it is very unlikely there are any remaining subsurface cultural deposits.

3.2.3 Previous Archaeological Work in the Project Area

3.2.3.1 Barrera 1971

William Barrera (1971) of the Bernice Pauahi Bishop Museum Anthropology Department conducted an archaeological survey in South Hālawa Valley for the proposed Honolulu Stadium. His letter report dated 30 April 1971 basically consists of three paragraphs that include no figures, photographs, tables or references (Figure 37). There were no historic properties identified.

Barrera concluded,

Any sites that may have been present at one time have been destroyed by housing areas, truck farming areas or cane fields. Independent conversations with three local informants revealed that those areas not now covered by houses or farm plots were once extensively planted in cane.

These same informants stated knowledge of recent burial areas in the vicinity of the houses along Saratoga Drive. Many of these graves are unmarked, and their locations only generally known. Construction foremen should be advised to inform the State Health Department if any human remains are uncovered during construction activities. As for the marked graves, the people now living along Saratoga Drive should be consulted, as most, if not all, of these burials contain known relatives of these residents. The proper Health Department personnel should be contacted, and the bones relocated as soon as possible before construction is started.

The cost of the project was $23,300.

Sincerely yours,

William Barrera, Jr.
Field Director in anthropology

Figure 37. Barrera (1971) Archaeological Site Survey of the Proposed Honolulu Stadium Site at Halawa, O’ahu
be contacted, and the bones relocated as soon as possible, before construction is started. [Barrera 1971:1]

3.2.3.2 Sroat et al. 2012

CSH (Sroat et al. 2012) conducted an AIS for Construction Phase 2 of the Honolulu High-Capacity Transit Corridor project that extended along Kamehameha Highway on the makai (west) side of the stadium parcel (TMK: [1] 9-9-003:061) and included the entirety of TMK: [1] 9-9-003:071 (proposed as the Aloha Stadium Station and a “Park and Ride” lot for the transit project).

Two test excavations (E24 and E25) were conducted along Kamehameha Highway approximately 100 m northwest of the Aloha Stadium parcel and three test excavations (AS1, AS2, and AS3) were conducted within the Aloha Stadium Station and surrounding Park and Ride Facility (Appendix B). The closest historic property identified in the Sroat et al. (2012) study was SHIP # 50-80-69-7150 (buried lo'i or irrigated pond-field deposits) approximately 2.5 km to the northwest.

Section 4 Results of Fieldwork

The field inspection consisted of a pedestrian inspection of the project area with the exception of building and structure interiors. As previously discussed, the project area for the current study consists of four discrete, neighboring parcels, divided by legs of Salt Lake Boulevard for a total project area of approximately 98.32 acres (39.79 hectares) and includes the current Aloha Stadium development, associated parking lots, a portion of the Hālawa Stream, and the HRTP Hālawa Station.

No evidence of traditional Hawaiian occupation or potential historic properties was observed during the field inspection. All structures and infrastructure present within the project area appear to be associated with the Aloha Stadium and the current construction of the HRTP Hālawa Station.

The northeastern portion of the project area (TMK: [1] 9-9-003:061) is composed of Aloha Stadium and associated asphalt paved parking lots. The area appears to have been almost entirely, if not entirely, graded and transformed during the development of the Aloha Stadium (see Figure 30 through Figure 32). Generally, the asphalt parking lot areas are flat in the south and the parking areas surrounding Aloha Stadium contain mild sloping with landscaped areas between parking sections (Figure 38 through Figure 41). The landscaping consists of monkey pod trees (Albizia sp.), bougainvillea (Bougainvillea sp.), white spider lily (Amaryllidaceae), ti varieties (Cordyline terminalis), coconut palm trees (Cocos nucifera), decorative palm trees (Areaceae), and eucalyptus trees (Eucalyptus sp.). The southern portion of the Aloha Stadium parking lot contains a portion of the Hālawa Stream running east/west (Figure 42 and Figure 43). The Hālawa Stream is composed of a concrete canal with three concrete overpass bridges for vehicular and pedestrian access. The front entrance of Aloha Stadium contains a monument (Figure 44) and a statue (Figure 45), both of which have plaques dating to the 1980s (Figure 46 and Figure 47).

The northwestern portion of the project area (TMK: [1] 9-9-003:071) contains a mixture of a Kiewit construction base yard and ongoing construction activities related to the HRTP Hālawa Station (Figure 48). Any evidence of buildings or parking lots in the area has been demolished and removed. The area appears to have been completely graded and transformed during current construction activities. No potential historic properties were identified in this area.

The southern portion of the project area (TMK: [1] 9-9-003:035) contains an irregular shaped area that appears of have been graded for the development of Aloha Stadium and surrounding residential areas. The eastern portion is being utilized as a Kiewit construction mobile office and small asphalt paved parking lot (Figure 49). The western portion contains an open grassy area with various alien grasses and shrubs. The area contains a swale with a few associated manholes (Figure 50). The northwestern portion of the area contains the edge of the sidewalk off a portion of Salt Lake Boulevard and has a steep slope extending into the swale. The southern border is fenced off by residential homes. No potential historic properties were identified in this area.

The southwestern portion of the project area (TMK: [1] 9-9-003:070) contains a thin strip beneath the newly constructed HRTP rail line. The majority of the area is fenced off and contains ongoing construction activities related to the HRTP Hālawa rail line (Figure 51). The area appears to have been completely graded for construction activities and contains new utilities and sidewalks for the HRTP rail line. No potential historic properties were observed in this area.
Figure 38. Overview of the property with Aloha Stadium in the background; view to northwest

Figure 39. Overview of the south end of the Aloha Stadium parking lot; view to southeast

Figure 40. Overview of the west corner of the parking lot with the HRTP rail line; view to north

Figure 41. Overview of the east portion of the Aloha Stadium parking lot; view to east
Figure 42. Overview of the portion of the Hālawa Stream that is in the project area; view to north

Figure 43. Overview of the portion of the Hālawa Stream that is in the project area; view to southwest

Figure 44. Monument at front entrance of the Aloha Stadium, view to east

Figure 45. Statue on display at the front entrance of Aloha Stadium; view to northwest
Figure 46. Close-up of a plaque on the monument fronting Aloha Stadium with 1980 date; view to northeast

Figure 47. Close-up of a metal plaque on the statue with a date of 1981; view to northwest

Figure 48. Northwestern portion of the project area showing construction activities for the HRTP Hālawa Station; view to southwest

Figure 49. Southern portion of the project area showing current Kiewit construction mobile office and parking lot; view to northwest
Section 5  Summary and Interpretation

5.1 Review of Potential Historic Properties Related to Traditional Hawaiian Occupation

The project areas are quite close to perennial Hālawa Stream (which extends through the southern third of the large stadium parcel) and extend to within 200 m of the `Aiea Bay portion of the East Lock of Pearl Harbor. While no historic properties have been previously identified within the project area, McAllister (1933) designated three fishponds as historic properties within 500 m of the project area. Loko Kunana and Loko Muliwai were collectively designated as McAllister Site 102 and Loko Kakahupōhaku was designated as McAllister Site 104 (see Figure 34). In fact there appear to have been at least six other small fishponds along the immediate stretch of Hālawa Stream with two of them within the project area (named Wai Kuohoi and Wai Kai; see Figure 10) but these have not been previously designated as historic properties. The relatively high density of fishponds in the vicinity testifies to the abundance of marine and stream resources on the margins of Pearl Harbor.

Our earliest map (1817 Kotzebue map; see Figure 8), while lacking cartographic precision clearly conveys that the margins of Hālawa Stream were well-settled and that areas of ponded field taro agriculture irrigated off Hālawa Stream were extensive. More detailed plotting of LCAs ca. 1848 (see Figure 9 and Figure 10) indicate there were approximately ten claimed parcels in the larger stadium project area near Hālawa Stream. While most of these were for ponded field taro agriculture, a large rectangular lot (LCA 2156:3 to Opunui) in the southwest portion of the stadium parcel was a house (pāhale) lot. The pattern of LCAs in this area are suggested to be indicative of a general pattern of agriculture and residence extending back in time for centuries. We cannot rule out that traces of agricultural features such as ‘ānuvai and field walls would still be present; the vicinity of the indicated habitation parcel is suggested to have an elevated prospect of cultural deposits relating to the pre-Contact and early post-Contact periods as well as a heightened prospect for intact burials and/or previously disturbed human skeletal remains. Remnants of the Wai Kuohoi and Wai Kai fishponds such as fishpond walls may also be present at those indicated locations (see Figure 10).

5.2 Review of Potential Historic Properties Related to the Rice Era in the Late 1800s

In the late 1800s much of the area near Hālawa Stream (particularly in the south portion of the large stadium parcel) was developed in rice production largely by Chinese immigrants (see Figure 12 and Figure 14). While this rice production may have disturbed any record of prior Hawaiian activity it may also have left archaeological traces of that cultivation and immigrant life.

5.3 Review of Potential Historic Properties Related to the Honolulu Plantation Company Independent Homestead Program

While the project areas were largely within a sea of Honolulu Plantation Company sugarcane fields from approximately 1900 to World War II (see Figure 24) with much of the project lands in sugarcane into the 1950s (see Figure 26), the Honolulu Plantation Company also had significant
infrastructure in the project areas in the form of roads, railroads, and housing developments that may have left archaeological evidence.

Klieger indicates two of the LCA parcels (LCA 2156:1 and LCA 2156:2) in the large stadium parcel previously belonging to Opanui became part of the Halawa Camp of the Honolulu Plantation Company (“Honolulu Plant Co,” see Figure 10). While not completely clear, these appear to have been areas where the Honolulu Plantation Company established an independent homestead program in 1902, “whereby individual laborers could receive personal use of land on company property in exchange for their continued employment commitment” [Klieger 1995:82]

It is understood that many of the Honolulu Plantation Company resident workers were from the Azores, Madeira or Puerto Rico (Klieger 1995:82) A look forward to the 1919 U.S. Army map (see Figure 19) suggests quite a number of plantation worker households were established along Hālawa Stream in the project area and also along a roughly parallel road to the north in this 1898-1919 period. An indicated 16-18 plantation homes are also prominent on the 1933 map (see Figure 21), on the 1935 map (see Figure 23), and many appear to be still present while others appear to be gone on the 1943 map (see Figure 25). Some of these families may have lived there lives in the project area for 40 years.

There are indications of two burial areas near the project area associated with the Honolulu Plantation Company. The neighboring large 'Aiea Cemetery, dating back possibly as far as 1901 and associated with 3,000 burials, appears to have always been discrete from the present project areas and to be a non-issue.

Deborah Cluff (1970) of the DLNR reported on an archaeological survey for the proposed Hālawa Interchange with the H-1 Freeway that arose from concerns of community members who described numerous graves within the area, including family graves. Historic grave structures were identified with a grave function attributed to four of the seven designated features (Features 4 through 7; see Figure 35 and Figure 36). The graves designated as SHIP # 5306 were only about 80 m east of the present project area (see Figure 34).

A comparison of the location of the graves documented by Cluff (see Figure 34), extending along the southeast side of a road she knew as “Saratoga Drive” extending southwest from Moanalua Road, with a 1919 map (see Figure 19), a 1935 map (see Figure 23), and a 1939 aerial photo (see Figure 24) indicate these were associated with a row of houses on the east side of the large stadium parcel along the south side of a road about 250 m north of where Hālawa Stream intersects the east side of the parcel. The east half of this row of houses was east (outside) of the large stadium parcel but the west half of this row of houses extended well into the large stadium parcel (Figure 52). A similar posited “independent homestead program” housing development of the Honolulu Plantation Company on the south side of Hālawa Stream within the east portion of the large stadium project area is also depicted on the 1919 map (see Figure 19 and Figure 52), a 1935 map (see Figure 23), and a 1939 aerial photo (see Figure 24). Whether these similar plantation housing areas within the large stadium parcel are associated with similar burial customs as documented by Cluff (1970) remains uncertain. There could be foundations or remnants of these plantation homes and associated features (privies, trash pits, burials) within the indicated areas of former plantation housing in the large stadium parcel.

Figure 52. Close-up of a portion of the 1919 U.S. Army War Department fire control map, Pearl Harbor Quadrangle showing plantation homes on the large stadium project area with a superimposition of the Cluff (1970) designated historic property with seven features (SHIP # 5306 including four burial features)
The prior archaeological study for the present stadium parcel noted, “These same [indicated as three, local] informants stated knowledge of recent burial areas in the vicinity of the houses along Sanitoga Drive. Many of these graves are unmarked, and their locations only generally known” (Barrera Jr. 1971:1).

That study cautioned that such graves might be encountered in the then proposed Honolulu stadium site.

5.4 Review of Potential Historic Properties Related to World War II

Clearly the project areas were subject to rapid military development in 1942-1943 when approximately 60 new (on average, quite large) buildings and new roads were built (see Figure 25). After the war some of these buildings were repurposed (for Halawa Kai School and seemingly for a fire station). Many of these World War II buildings were still extant in the project area in 1968 (see Figure 29) and many of these buildings may have only been demolished at the time of stadium construction in the early 1970s. Foundations or remnants of these buildings and associated infrastructure may be present in the project area.

5.5 Possible Architectural Concerns

The present Aloha Stadium officially opened on 12 September 1975 and is thus about 45 years old at this time and is not understood as a historic property in its own right and is not regarded as an architectural issue. The Aloha Stadium will reach 50 years of age in 2025.

Early consultation with the SHPD raised a question of possible visual impacts of the proposed NASED project on the Pearl Harbor Naval Base National Historic Landmark. It was pointed out that the new proposed stadium would be smaller than the existing stadium, but at that time plans included one or more possible high-rise residential structures and the SHPD expressed a desire to see a “massing” study of how the proposed developments would relate to the Pearl Harbor Naval Base National Historic Landmark. SHPD also expressed an interest in seeing the Navy’s corroboration that the proposed NASED project would have no effect on the Pearl Harbor Naval Base National Historic Landmark.
Section 7  References Cited

Aloha Stadium

Altizer, Kendy, Nifae Hunkin, Douglas F. Borthwick and Hallett H. Hammatt

Athens, J. Stephen, Dean W. Blinn, Caitlin E. Buck, J. André Christen, Robert H. Cowie, Tom Dye, Gail M. Murakami, and Jerome V. Ward

Avery, Serge, Peter Brennan, Tim Denham, Joseph Kennedy, and Jerome Ward

Barrera, William

Beasley, T.D.

Bureau of Conveyance

Cluff, Deborah

Cochrane, Ethan and J. Stephen Athens

Condé, Jesse C. and Gerald M. Best

Coulter, John Wesley and Chee Kwon Chun

Davis, Bertell D.

Donn, John M.
1906  Oahu, Hawaiian Islands. Registered Map 2374. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Dorrance, William H. and Francis S. Morgan

Dye, Thomas

Erkelens, Conrad

Foote, Donald E., Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens

Fornander, Abraham

LRFI for the NASED Project, Hālawa, ‘Ewa, O‘ahu 78
TMKc [1]9-9-003:055, 061, 070, and 071

LRFI for the NASED Project, Hālawa, ‘Ewa, O‘ahu 79
TMKc [1]9-9-003:055, 061, 070, and 071

Google Earth

Hamnett, Hallett H. and John Winieski

Hamnett, Hallett H., David W. Shideler, and Matthew McDermott,
2013 Archaeological Inventory Survey for the Airport Section (Construction Section 3) of the Honolulu High-Capacity Transit Corridor Project, Hālawa and Moanalua Ahupua`a, `Ewa and Honolulu Districts, Island of O`ahu TMK Sections [1] 1-1 and 9-9 (Various Plats and Parcels) Volumes 1 and 2. Cultural Surveys Hawai`i, Inc., Kailua, Hawai`i.

Handy, E.S. Craighill and Elizabeth Green Handy

Hawai`i State Archives
1939 U.S. Army Air Corps aerial photograph. Hawai`i State Archives, Honolulu.

Hawai`i TMK Service

HDOT (Hawai`i Department of Transporation)
1933 Engineering map. HDOT, Honolulu.

Higuchi, Pauline

Honolulu Sugar Company
1900-1925 Honolulu Sugar Company map. Registered Map 2643. Hawai`i Land Survey Division, Department of Accounting and General Services, Honolulu.

Hunkin, Niafe and Hallett H. Hamnett

ʻIwi, John Papa

Interior Department Letters

Kamakau, Samuel M.

Kame`eleihiwa, Lilikalā

Kekūanao`a, Mataio

Klieger, Paul Christiaan

Kotzebue, Otto von

Lyons, C.J.
1873 Pearl River. Registered Map 1639. Hawai`i Land Survey Division, Department of Accounting and General Services, Honolulu.
1874 Map of Aiea. Registered Map 323. Hawai`i Land Survey Division, Department of Accounting and General Services, Honolulu.

McAllister, J. Gilbert

Monsarrat, M.D.
1888 Map of Halawa. Registered Map 1687. Hawai`i Land Survey Division, Department of Accounting and General Services, Honolulu.

Murabayashi, Krickette, Elaine H.R. Joudane, and Thomas S. Dye
Determination of Historic Significance of Pohaku O Kii State Site No. 50-80-09-


Appendix A  LCA Data

LCA 1996 to Naea

| Uku Pau Loa $6.— |
| W.L. Lee |
| G.M. Robertson |
| J. Kekaulahao |

Honolulu Mar. 18, 1851  Ioane Li
J.H. Smith

Translation:
Cl. No. 1996 Naea land division in Kulina, Hālawa. E.O.
This is a land parcel of Kulina, in the land section of Kulina, Hālawa, Ewa, O‘ahu. Begin at the northwestern corner, and proceed 70°, 104.28 feet east at the boundary of the fenced land; from there go 12° south and 211.2 feet east upon the boundary of Kumupali. Proceed north 75°, east 9.9 feet and then proceed south 31°, east 165 feet upon the boundary of Kumupali. From there go south 24°, 243.54 feet east on the border of Kumupali, until reaching the boundary of the river. From there, upon the boundary of the river, proceed south 79° and west 201.3 feet. Then proceed north 31 1/2°, and west 246.84 feet upon the boundary of the fenced land. Proceed north 63°, and east 169.62 feet upon the boundary of the kō‘ele, land farmed for the chief. Then, proceed north 25°, west 153.78 feet upon one of the borders of the kō‘ele. Proceed south 56°, and west 58.74 feet upon one border of the kō‘ele. Then proceed south 15°, east 38.94 feet, then south 82° and west 31.68 feet upon the side of the kō‘ele. This, then, proceed north 5°, west 192.06 feet upon the border of Manukapua until the corner. Then proceed north 22°, west 48.84 feet until the beginning corner. Within this land division is two acres and 135.96 square feet.
A. Bishop
Surveyor

Total Cost $6.—
W.L. Lee
G.M. Robertson
J. Kekaulahao

Honolulu Mar. 18, 1851  John ‘Īnī
J.H. Smith

Cl. No. 1996 Naea Apana ma Kulina, Hālawa. E.O.
He mooaina Kulina, ili o Kulina, Hālawa, Ewa, Oahu. E hoomaku ma ke kihi akau komohana, a e hele aku 70° Hik. i 1.58 k.h. ma ka palena o ka pa aina; malaila aku Hem. 12° Hik. i 3.20 k.h. ma ka aoao o Kumupali; Malaila aku Ak. 73° Hik. i 0.15 k.h. a malaila aku Hem. 31° Hik. i 2.5 k.h. ma ka aoao o Kumupali. Malaila aku Hem. 24° Hik. e pilo ana me Kumupali i 3.69 k.h. a hiki i kapa o kahawai. Malaila aku ma kapa o kahawai Hem. 79° Kom. i 3.05 k.h. Malaila aku Ak. 31 1/2° Kom. i 3.74 k.h. ma ka aoao o ka pa‘a‘ina. Malaila aku Ak. 63° Hik. i 2.57 k.h. ma ka palena koʻe; Malaila aku Ak. 25° Kom. i 3.33 k.h. ma kekahi aoao o ke ko‘e; Malaila aku Hem. 56° Kom. i 0.89 k.h. ma kekahi aoao o ke ko‘e; Malaila aku Hem. 15 1/2° Hik. i 0.59 k.h. A malaila aku Hem. 62° Kom. i 0.48 k.h. ma ka aoao o ke ko‘e. Malaila aku Ak. 5° Kom. i 2.91 k.h. ma ka aoao o Manukapua a hiki i ke kihi. Malaila aku Ak. 22° Kom. i 0.74 k.h. a hiki i hoomaka ai. Maloko o keia aina he 2 Eka me 2.06 k.h. huinahalike.
A. Bishop
Mea ana

[Diagram in Original]
LCA 2047 to Kekio

[Diagram in Original]

Cl. No. 2047 Kekio, (make) 2 Apana ma Kulina, Halawa. E.O. (Kanui, kana wahine Ka Hoolina.)

Ap. 1 He 1/2 Loi me ke kula iloko o Kaahuwoo, ili Kulina, Halawa. E.O. E hoomaka ana ma ke kihi akau Konohana, a e hele ana Ak. 76° Hik. i 1.20 kh. ma ka aoao o ka Patina; Hem. 19° Hik. i 4.72 kh. ma ka aoao o ke Konohiki; Hem. 64° Kom. i 1.34 kh. ma ka aoao o ke Koele; Ak. 23° Kom. i 1.47 kh. ma ka aoao Kulina; Ak. 69° Hik. i 0.91 kh. ma ko Kaheana 1/2 Loko kalo; Ak. 26° Kom. i 3.38 kh. ma ko Kaheana 1/2 loko kalo. Maloko o keia apana he 5.28 kh. huinahalike.

Ap. 2 He kula iloko a ka moo Kaahuwoo, Kulina, Halawa. E hoomaka ana ma ke kihi akau, a e hele ana Hem. 68° Kom. i 1.36 kh. ma ka palena o ka loi o Kaheana; Hem. 28° Hik. i 3.27 kh. ma ka palena o ko Konohiki Kula; Ak. 80° Hik. i 1.23 kh. ma ka palena o kaupa Kahawai; Ak. 23 1/2° Kom. i 3.63 kh. ma ka kula o Konohiki. Ma keia apana he 4.48 kh. huinahalike. Ma ma apana elua he 9.76 kh. huinahalike. A Biheapa

Mea Ana.

[Diagram in Original]

Cl. No. 2047 Kekio, (make) 2 Apana ma Kulina, Halawa. E.O.

(Kanui, his wife, is the recipient.)

Division One. This is 1/2 of an irrigated terraced garden with a field within Kaahuwoo, land section of Kulina, Halawa, E.O. Begin at the northwestern corner and proceed north 76° and east 79.2 feet at the boundary of the fenced land. Then proceed south 19° and east 311.52 feet upon the boundary of the Konohiki, the land manager. Proceed south 64° and east 101.64 feet upon the boundary of the Koele, the land farmed for the chief. Then, go north 23° and west 97.02 feet upon the boundary Kulina. Then proceed north 69° and east 60.06 feet upon Kaheana’s 1/2 taro pond. Then proceed north 26° and west 223.08 feet upon Kaheana’s 1/2 taro pond. Within this division there are 348.48 square feet.

Division Two. A field within the strip of land Kahuwoo, Kulina, Halawa. Begin at the northern corner and proceed south 68° and west 89.76 feet upon the border of the irrigated terraced garden of Kaheana. Then proceed south 28° and east 215.82 feet on the border of the field of the Konohiki. Proceed north 80° and east 81.18 feet upon the boundary of the river, then go north 23 1/2° and west 239.58 feet upon the field of the Konohiki. In this division there are 295.68 square feet. Within the two divisions there are 644.16 square feet.

A. Bishop.

Surveyor.

Total Cost $5.

W. L. Lee

G. M. Robertson

J. Kekaualahao

Honolulu, Mar. 18, 1851

Ioane Ii

J. H. Smith

Translation:

Cl. No. 2047 Kekio, (make) Two land divisions in Kulina, Hālawa, E.O.

(Kanui, his wife, is the recipient.)

Division One. This is 1/2 of an irrigated terraced garden with a field within Kaahuwoo, land section of Kulina, Hālawa, E.O. Begin at the northwestern corner and proceed north 76° and east 79.2 feet at the boundary of the fenced land. Then proceed south 19° and east 311.52 feet upon the boundary of the Konohiki, the land manager. Proceed south 64° and east 101.64 feet upon the boundary of the Koele, the land farmed for the chief. Then, go north 23° and west 97.02 feet upon the boundary Kulina. Then proceed north 69° and east 60.06 feet upon Kaheana’s 1/2 taro pond. Then proceed north 26° and west 223.08 feet upon Kaheana’s 1/2 taro pond. Within this division there are 348.48 square feet.

Division Two. A field within the strip of land Kahuwoo, Kulina, Hālawa. Begin at the northern corner and proceed south 68° and west 89.76 feet upon the border of the irrigated terraced garden of Kaheana. Then proceed south 28° and east 215.82 feet on the border of the field of the Konohiki. Proceed north 80° and east 81.18 feet upon the boundary of the river, then go north 23 1/2° and west 239.58 feet upon the field of the Konohiki. In this division there are 295.68 square feet. Within the two divisions there are 644.16 square feet.

A. Bishop.

Surveyor.

Total Cost $5.

W. L. Lee

G. M. Robertson

J. Kekaualahao

Honolulu, Mar. 18, 1851

Ioane Ii

J. H. Smith
LCA 2139 to Kinilau

Cl. No. 2139 Kinilau; 1 Apana ma Kalina, Halawa. E.O.
He mooaina, Manakapua, i i o Kalina Halava, E.O. E hoomaka ma ke khi Akau, a e hele ana Hem. 22º Hik. i 1.50 kh. ma ka palena o ka moo Kalina, a ke khi. Malaila aku Hem. 5º Hik. i 2.91 kh. ma ka palena o Kalina, a ke khi. Malaila aku Hem. 67º Kom. i 0.54 kh. ma ka palena koae a ke khi. Malaila aku Hem. 26º Hik. i 1.81 kh. a ke khi. Malaila aku Hem. 58º Kom. i 0.60 kh. ma ka palena aina o Naea a ke khi. Malaila aku Ak. 34º Kom. i 5.94 kh. ma ka palena paaina o ke khi. Malaila aku Ak. 61º Hik. i 2.78 kh. ma ka palena pa aina a hiki i kahi i hoomaka ai. Maloko o keia aina, he Eka 1 me 0.26 kh. hunahalike. A.Bihopa Mea Ana.

[Diagram in Original]
[Text in Diagram: Moo Kalina, Koele, Ko Naea, Paasina, Paasina]

Translation:
Cl. No. 2139 Kinilau; One land division in Kalina, Halawa, E.O. This is a land parcel, Manakapua, a subdivision of Kalina, Halawa, E.O. Begin at the north corner, proceed south 22º and east 99 feet upon the border of the division Kalina until the corner. Then, proceed south 5º and east 192.06 feet upon the border of Kalina until the corner. From there, proceed south 67º and west 35.64 feet upon the border of the ko'eie, the land farmed for a chief, until the corner. Then proceed south 26º, and east 119.46 feet until the corner. Then proceed south 58º and west 39.6 feet upon the boundary of the land Naea, until the corner. From there go north 31º and west 392.04 feet upon the boundary of the fenced land, until the corner. Then proceed north 61º and east 183.48 feet upon the boundary of the fenced land until the beginning corner. Within this land is one acre and 17.16 square feet. A. Bishop, Surveyor.

LCA 2156 to Opunui

Cl. No. 2156 Opunui; 3 Apana ma Kaloiki, Halawa, Ewa, Oahu.
He mooaina Konohihulelehu, i i o Kaloiki, Halawa, Ewa, Oahu. Apana 1. He loi 1 lilo o Konohihulelehu, Kaloiki, Halawa. E hoomaka ana ma ke khi akau, a e hele ana Hem. 53º Kom. i 1.66 Kh. ma ka palena aavea; Hem. 42º Hik. i 1.35 kh. ma ka palena koele; Ak. 53º Hik. i 1.37 kh. ma ka palena koele Ak. 42 1/2º Kom. i 1.32 kh. ma ka palena koele. Maloko o keia loi, he 2.20 kh. hunahalike.

Ap. 2. Kaloiki, i i o Kaloiki, 2 loi me ke kala. E hoomaka ana ma ke khi Akau, a e hele ana Hem. 60º Kom. i 5.46 kh. ma ka aoao o Kakaepapai; Hem. 38º Hik. i 1.89 kh. ma ka aoao o Koele, Ak. 88 Hik. i 4.63 kh. ma ka aoao o ka pali Ak. 12 1/2º Kom. i 4.55 kh. ma ka aoao o ko Pualiliili. Maloko o keia apama, Eka 1 me 5.20 kh. hunahalike.
Ap. 3. He Pahale iiloko o Kala Pionomoei, Halawa, E.O. E hoomaka ana ma ke kahi Hikina, a e holo ana Ak. 56° Kom. i 1.63 kh, Hem. 26° Kom. i 4.47 kh. Hem. 51° 'Hik. i 1.89 k.h, Ak. 22 1/2° Hik. i 4.67. Maloko o keia pahale he 8.08 kh. huinahalike A Bihopa.
A ma na Apana a pun he 2 Ek me 5.48 kh. huinahalike Mea ana.

[Diagram in Original]

[Text in Diagram: Kakaepa Pai, No Puaditiili, Aosao Pali, Koeele, 2, Kula, Kula, Kula, Kohawaii, 3, Awawai, Koeele, Koeele, Koeele, 1]
LCA 9332 to Kaheana

Cl. No. 9332 Kaheana: 2 Apana ma Kulina, Halawa, E.O.

Ap.1. He 1/2 Loko Kalo, Kaihuamo’o, ili o Kulina, Halawa, E.O. E hoomaka ma ke kahi Hikina a e hele Ak. 63 ¾ Kom in 3.40 kh mawena o ka loa a ke kahi. Malalai aku Hem. 63 1/2° Kom. in 1.00 kh, ma ka palena paaina a ke kahi. Malalai aku Hem. 27° Hik. in 3.30 kh. ma ka palena aina o Konohiki a ke kahi. Malalai aku Ak. 69° Hik. in 0.91 kh. ma ka palena loo o Kanuai a hiki i kahi i hoomaka ai. Maloko o keia Apana he 3.19 kh huinahalike.

Ap.2. He loo iloko o Kiihumuu, Kulina, Halawa, E.O. E hoomaka ma ke kahi Komohana, a e hele Ak.63 ¾ Hik. in 1.46 kh ma ka palena koele a ke kahi. Malalai aku Hem. 10° Hik. in 1.93 kh a ke kahi. Malalai aku Hem. 67° Kom. in 1.57 kh ma ka palena kula o Kamalanai. Malalai aku Ak. 19° Kom. in 1.05 kh ma ka palena koele a hiki i kahi i hoomaka ai. Maloko o keia Apana, he 1.56 kh hunaialike. Maloko o oia Apana ehu he 4. 75/100 kh. hunaialike.

A Bihopa
Mea Ana

[Text in diagram: Konohiki, Pu aina, 1/2 Loko o Kanuai, Loi o Kanuai, Konohiki, Koele, Kekio, Kula o Konohiki]}

Honolulu Mar 18, 1851

Translation:
Cl. No. 9332 Kaheana; 2 divisions in Kulina, Hālawa, E.O.

Division One. 1/2 taro pond, Kaihuamo’o, land parcel of Kulina, Hālawa, E.O. Begin at the east corner and proceed north 63 1/2° and west 224.4 feet between the lo‘i, irrigated terraced garden, until the corner. Then proceed south 63 1/2° and west 66 feet upon the boundary of the fenced land until the corner. Then proceed south 27° and east 217.8 feet upon the boundary of the land of the land manager, until the corner. Then proceed north 69° and east 60.06 feet upon the border of the lo‘i of Kanuai, until the beginning corner. Within this division is 210.54 square feet.

Division Two. A lo‘i within Kiihumoo‘o, Kulina, Hālawa, E.O. Begin at the western corner and proceed north 65° and east 96.36 feet until the boundary of the kō‘ele, the land farmed for a chief, until the corner. Then proceed south 10° and east 61.38 feet until the corner. Then proceed south 67° and west 103.62 feet upon the border of the field of Kamalanai. Then proceed north 19° and west 69.3 feet upon the boundary of the kō‘ele until the beginning corner. Within this division is 102.96 square feet. Within these two divisions is a total of 313.5 square feet. A Bishop. Surveyor.

Total Cost $4.

W.L. Lee
G.M. Robertson
J. Kekaulahao

Honolulu, Mar. 18, 1851

J.H. Smith
Ioane ï""i

93
Appendix B  Data on Excavations in the Immediate Vicinity adapted from the Sroat et al. 2012 AIS study

Transit Corridor Excavations (E24 and E25) along Kamehameha Highway Just NW of the Stadium (Sroat et al. 2012:169-175)

<table>
<thead>
<tr>
<th>Trench:</th>
<th>E24</th>
</tr>
</thead>
<tbody>
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<td>Length:</td>
<td>6 meters</td>
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<tr>
<td>Width:</td>
<td>0.8 meters</td>
</tr>
<tr>
<td>Maximum Depth:</td>
<td>3.3 meters</td>
</tr>
<tr>
<td>Orientation:</td>
<td>156°-336°</td>
</tr>
<tr>
<td>Water Table:</td>
<td></td>
</tr>
<tr>
<td>Base of Fill Sediments</td>
<td>3.3 meters below surface</td>
</tr>
<tr>
<td>LCA #:</td>
<td>2102</td>
</tr>
</tbody>
</table>

Trench E24 is located along Kamehameha Highway just southeast of the Moanalua Freeway overpass (Figure 111). The trench is within the former land boundary of LCA #2102. Land use for this LCA is documented as `ioi, kula, fishpond, and house lot. The trench is located in a road cut. The land surface rises ~6 meters to the north of the road and is fairly level along the southern end of the road as it descends to the harbor. According to an HDOT construction drawing for the development of Kamehameha Highway in 1933, Trench E24 is located northwest of a hospital (the former Honolulu Plantation Hospital) and partially within a dirt road leading to the railroad depot to the southwest (refer to Figure 100). During construction the road surface in this area was elevated and graded ~3-9 feet (~0.91-2.74 m) above the 1933 ground surface (as profiled at the median of the highway) (refer to Figure 101). The utility line consists of a gas line 2 meters to the southwest running parallel to the trench.

The stratigraphy encountered for Trench E24 consisted of the asphalt road surface (Stratum Ia), crushed coral base course (Stratum Ib), asphalt surface (Stratum Ila), gravelly clay fill (Stratum IIb), and natural silty clay loam (Stratum III) (Figure 112, Figure 113, Table 25). Based on a lack of structure, angular basalt gravel inclusions, and abrupt lower boundary Stratum IIb consisted of fill material. The underlying Stratum III contained formative structure indicative of natural sediment. A wet-screened 5.0 L sample of Stratum III (265-270 cmbs) yielded several waterworn gravels, small charcoal fragments (0.5 g), a small coral branch, several angular basalt cobbles, and 6 organic filaments. As the charcoal fragments were not encountered within a feature, but rather floated generally within the stratigraphy, and no evidence of agricultural land usage was observed, the stratum appeared to be charcoal-enriched alluvial sediment. No cultural deposits associated with LCA #2102 were identified.
Table 4. Stratigraphic Description for Trench E24

<table>
<thead>
<tr>
<th>Stratum (cmbs)</th>
<th>Description of Sediment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>0-40 Asphalt, Kamehameha Highway road surface; abrupt, smooth lower boundary</td>
</tr>
<tr>
<td>1b</td>
<td>40-100 Fill; crushed coral base course; clear, smooth lower boundary</td>
</tr>
<tr>
<td>1la</td>
<td>100-125 Asphalt or rock tar and mud conglomerate; buried road or driveway surface</td>
</tr>
<tr>
<td>1lb</td>
<td>125-240 Fill; 10 YR 5/3 (brown); gravelly clay; structureless, single grain; moist, firm consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; no roots; contains angular basalt cobbles</td>
</tr>
<tr>
<td>III</td>
<td>240-330 Natural; 10 YR 4/2 (dark grayish brown); silty clay loam; weak, medium, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; lower boundary not visible; no roots; sterile sediment</td>
</tr>
</tbody>
</table>

Trench E25

<table>
<thead>
<tr>
<th>Trench</th>
<th>Width</th>
<th>Depth</th>
<th>Base of Fill Sediments</th>
</tr>
</thead>
<tbody>
<tr>
<td>E25</td>
<td>6 meters</td>
<td>1.9 meters</td>
<td>1.51 meters below surface</td>
</tr>
</tbody>
</table>

Trench E25 is located along Kamehameha Highway south of ‘Aiea Cemetery (Figure 114). The trench is situated in a road cut ~6 meters below the ground surface of the cemetery and level with the ground surface to the south of the highway. According to an HDOT construction drawing for the development of Kamehameha Highway in 1933, Trench E25 is located at the northern boundary of ‘Aiea Cemetery (refer to Figure 100). During construction the road surface in this area was cut and graded ~24 feet (~7.32 m) below the 1933 ground surface (as profiled at the median of the highway) (refer to Figure 101). Figure 100 also notes that 414 graves within ‘Aiea Cemetery were located within the right-of-way of the highway (see also discussion in Section 8.4). No utilities were marked near the trench location. However, while conducting ground penetrating radar, CSH documented a sewer trench which ran perpendicular across the eastern end of the trench.

The stratigraphy encountered for Trench E25 consisted of the asphalt road surface (Stratum Ia), crushed coral base course (Stratum Ib), two fill layers associated with the sewer line (Stratum Ia and Iib), sandy silt loam fill (Stratum IIC), clay loam fill (Stratum IId), crushed coral fill (Stratum Ile), asphalt and basalt gravel fill (Stratum III), gravelly clay loam fill (Stratum IIIa), and natural basalt bedrock (Stratum IIIb) (Figure 115, Figure 116, Table 26). The natural sediment encountered was a C-horizon of basalt bedrock, which was overlain by two episodes of road development. This area appeared severely impacted by road construction within the twentieth century, which effectively removed all natural sediments atop the basalt bedrock (refer to Section 8.4). No cultural deposits associated with ‘Aiea Cemetery were identified.
Figure 55. Photograph of the location of Trench E25, view to the northwest

Figure 56. Photograph of the west wall profile of Trench E25, view to the northwest

Table 5. Stratigraphic Description for Trench E25

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Depth (cm)</th>
<th>Description of Sediment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>0-40</td>
<td>Asphalt; Kamehameha Highway road surface; abrupt, smooth lower boundary</td>
</tr>
<tr>
<td>Ib</td>
<td>40-90</td>
<td>Fill; crushed coral base course; clear, smooth lower boundary</td>
</tr>
<tr>
<td>Ia</td>
<td>45-110</td>
<td>Fill; 10 YR 3/2 (very dark grayish brown); gravelly silt loam; structureless; dry, loose consistency; non-plastic; terrigenous origin; very abrupt, smooth lower boundary; no roots; fill associated with sewer line</td>
</tr>
<tr>
<td>Ib</td>
<td>110-190</td>
<td>Fill; crushed coral; lower boundary not visible; fill around sewer line</td>
</tr>
<tr>
<td>Ic</td>
<td>90-125</td>
<td>Fill; 10 YR 3/3 (dark brown) with 40% coral gravel; sandy silt loam; weak, fine, crumb structure; dry, weakly coherent to moist, very friable consistency; non-plastic; terrigenous and marine origin; clear, irregular lower boundary; no roots</td>
</tr>
<tr>
<td>Id</td>
<td>90-95</td>
<td>Fill; 10 YR 3/3 (dark brown); clay loam; weak, fine, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary; no roots</td>
</tr>
<tr>
<td>Ii</td>
<td>95-110</td>
<td>Fill; crushed coral fill; clear, smooth lower boundary</td>
</tr>
<tr>
<td>II</td>
<td>95-129</td>
<td>Fill; asphalt and basalt gravel pieces; clear, smooth lower boundary; buried road surface</td>
</tr>
</tbody>
</table>
Aloha Stadium Station Excavations (from Sroat et al. 2012:191-200)

The following provides a description of the stratigraphy observed within three test trenches excavated in the Aloha Stadium Transit Station project area. Trenches AS (Aloha Stadium) 1 and AS3 are within the boundaries of the Park and Ride Facility, while Trench AS2 is located within the footprint of the Aloha Stadium Transit Station (Figure 58). The topography of the project area is level and a large parking lot is currently within the project boundaries.

Trench AS1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trench:</td>
<td>AS1</td>
</tr>
<tr>
<td>Length:</td>
<td>6 meters</td>
</tr>
<tr>
<td>Width:</td>
<td>0.75 meters</td>
</tr>
<tr>
<td>Maximum Depth:</td>
<td>1.3 meters</td>
</tr>
<tr>
<td>Orientation:</td>
<td>122°-302°</td>
</tr>
<tr>
<td>Water Table:</td>
<td>N/A</td>
</tr>
<tr>
<td>Base of Fill Sediments:</td>
<td>1.15 meters below surface</td>
</tr>
<tr>
<td>LCA #:</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Trench AS1 is located in the northeastern section of the proposed Park and Ride facility (Figure 59). The stratigraphy encountered for Trench AS1 consisted of the parking lot asphalt road surface (Stratum Ia), crushed coral base course (Stratum Ib), two clay loam fill layers (Strata Ila-Iib), and two gravelly sandy silt layers (Strata IIIa-IIIb). Stratum IIB evidenced an abrupt lower boundary, indicative of fill material. Stratum III contained inclusions of vesiculated, well-rounded basalt pebbles and cobbles associated with fluvial transport. The inclusions are highly weathered and appear to be in-situ. These layers may indicate a localized, variable energy, fluvial environment that predates any historic development (Figure 59, Figure 60, Figure 61, and Table 6). The wavy upper boundary of Stratum III indicates that the trench area was not graded prior to the deposition of fill materials.

A wet-screened 2.0 L sample of Stratum Ila (85 cmbs) yielded water-rounded basalt gravel. A 3.0 L sample of Stratum IIIa (115 cmbs) yielded fine to coarse basaltic sand. No cultural deposits were identified within this trench.
Figure 59. Photograph of Trench AS1, located in the northeastern region of the proposed Park and Ride facility, showing general overview, view to the southeast

Figure 60. Photograph of the southeast wall profile of Trench AS1, view facing southeast
Figure 61. Profile of the southeast wall of Trench AS1

Table 6. Stratigraphic Description for Trench AS1

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Depth (cmbs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>0-10</td>
<td>Asphalt; parking lot surface; very abrupt, smooth lower boundary</td>
</tr>
<tr>
<td>lb</td>
<td>10-20</td>
<td>Fill; crushed coral base course; very abrupt, smooth lower boundary</td>
</tr>
<tr>
<td>IIa</td>
<td>20-70</td>
<td>Fill; 7.5 YR 3/4 (dark brown); clay loam; structureless; moist, firm consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary; no roots visible; graded clay fill</td>
</tr>
<tr>
<td>IIb</td>
<td>70-115</td>
<td>Fill; 10 YR 4/1 (dark grey) with abundant mottles of 10 YR 4/4 (dark yellowish brown); silty clay loam; structureless; moist, firm consistency; slightly plastic; terrigenous origin; abrupt, wavy lower boundary; no roots observed</td>
</tr>
<tr>
<td>IIIa</td>
<td>95-130</td>
<td>Natural; 10 YR 4/3 (brown); gravelly sandy silt; structureless; dry, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; no roots observed; pebble to medium cobble inclusions</td>
</tr>
<tr>
<td>IIIb</td>
<td>130-139</td>
<td>Natural; 10YR 4/3 (brown); gravelly sandy silt; structureless; dry, loose consistency; non-plastic; terrigenous origin; abrupt, wavy lower boundary; no roots observed; pebble to medium cobble inclusions; similar to IIIa but with a higher degree of cementation</td>
</tr>
</tbody>
</table>

Trench AS2

<table>
<thead>
<tr>
<th>Trench:</th>
<th>AS2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length:</td>
<td>6 meters</td>
</tr>
<tr>
<td>Width:</td>
<td>0.75 meters</td>
</tr>
<tr>
<td>Maximum Depth:</td>
<td>1.8 meters</td>
</tr>
<tr>
<td>Orientation:</td>
<td>150°-30°</td>
</tr>
<tr>
<td>Water Table:</td>
<td>N/A</td>
</tr>
<tr>
<td>Base of Fill Sediments:</td>
<td>0.45 meters below surface</td>
</tr>
<tr>
<td>LCA #:</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Trench AS2 is located within the footprint of the Aloha Stadium Transit Station project area (see Figure 58, Figure 62). The stratigraphy encountered for Trench AS2 consisted of the parking lot asphalt road surface (Stratum Ia), crushed coral base course (Stratum Ib), natural clay loam (Stratum II), and gravelly sandy silt (Stratum III). Based on the formative structure within Stratum II, this layer likely consisted of natural sediment. Stratum II corresponded with the description of the Waipahu soil series described for this area by the USDA (Foote et al. 1972, also see Figure 6). The underlying Stratum III contained inclusions of vesiculated, well-rounded basalt pebbles and cobbles associated with fluvial transport, similar to Stratum II within Trench AS1. The inclusions are highly weathered and appear to be in-situ. These layers may indicate a localized, variable energy, fluvial environment that predates any historic development (Figure 63, Figure 64, Figure 65, and Table 7).

A 2.0 L sample of Stratum II (65-80 cmbs) was collected, wet-screened through fine mesh, and yielded a small number of very fine sand-sized basalt particles. No cultural deposits were encountered within this trench.
Table 7. Stratigraphic Description for Trench AS2

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Depth (cmbs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>0-17</td>
<td>Asphalt; parking lot surface; very abrupt, smooth lower boundary</td>
</tr>
<tr>
<td>Ib</td>
<td>17-45</td>
<td>Fill; crushed coral base course; very abrupt, smooth lower boundary</td>
</tr>
<tr>
<td>II</td>
<td>45-114</td>
<td>Natural; 10 YR 4/4 (dark yellow brown); clay loam; moderate, very fine, crumb structure; moist, very friable consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary; no roots visible</td>
</tr>
<tr>
<td>III</td>
<td>114-187</td>
<td>Natural; 10 YR 2/2 (very dark brown); gravelly sandy silt; weak, fine, crumb structure; moist, very friable consistency; non-plastic; terrigenous origin; lower boundary not visible; no roots observed; well-rounded pebble and cobble inclusions</td>
</tr>
</tbody>
</table>
### Trench AS3

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trench:</td>
<td>AS3</td>
</tr>
<tr>
<td>Length:</td>
<td>6.2 meters</td>
</tr>
<tr>
<td>Width:</td>
<td>0.75 meters</td>
</tr>
<tr>
<td>Maximum Depth:</td>
<td>1.7 meters</td>
</tr>
<tr>
<td>Orientation:</td>
<td>123°-303°</td>
</tr>
<tr>
<td>Water Table:</td>
<td>N/A</td>
</tr>
<tr>
<td>Base of Fill Sediments</td>
<td>0.30 meters below surface</td>
</tr>
<tr>
<td>LCA #:</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Trench AS3 is located in the southwestern section of the proposed Park and Ride facility (see Figure 58, Figure 66). The stratigraphy encountered for Trench AS3 consisted of two soil and gravel fill layers (Strata Ia and Ib), two natural clay loam layers (Strata Ila-Ilb), and a natural clay loam layer with decomposing basalt inclusions (Stratum III) (Figure 67, Figure 68, Table 6). Stratum Ia contained distinct structure and a wavy lower boundary, indicative of natural sediment, although some amount of disturbance at the upper boundary was evident by small inclusions of sediment from Stratum Ib. Strata Ila and Ilb were consistent with the description of the Makalapa soil series described for this area by the USDA (Foote et al. 1972, also see Figure 6). Bulk samples of Strata Ila (30-50 cmbs) and Ilb (60-85 cmbs) were collected and wet-screened through fine mesh. Stratum Ia yielded fine to coarse basalt sand and fine roots. Stratum Ilb similarly yielded very fine to coarse basalt sand and fine roots. No cultural deposits were encountered within this trench.

![Figure 66. Photograph of Trench AS3, showing general overview, view to the southwest](image)

![Figure 67. Photograph of south wall profile of Trench AS3, view facing south](image)

![Figure 68. Profile of the south wall of Trench AS3](image)
Table 8. Stratigraphic Description for Trench AS3

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Depth (cm)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>0-10</td>
<td>Fill; 10 YR 3/3 (dark brown); gravelly silt; weak, very fine, crumb structure; dry, weakly coherent consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; many fine roots; top soil and gravel layer</td>
</tr>
<tr>
<td>Ib</td>
<td>10-30</td>
<td>Fill; 10 YR 3/6 (dark yellowish brown); sandy silt; weak, very fine, crumb structure; dry, slightly hard consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; few fine roots; top soil; inclusions of scattered coral and gravel</td>
</tr>
<tr>
<td>IIa</td>
<td>30-45</td>
<td>Natural; 10 YR 3/2 (very dark grayish brown); clay loam; moderate, very fine, blocky structure; dry, hard consistency; slightly plastic; terrigenous origin; clear, wavy lower boundary; few fine roots; evidence of disturbance from the importation of fill layers</td>
</tr>
<tr>
<td>IIb</td>
<td>45-130</td>
<td>Natural; 10 YR 3/2 (very dark grayish brown); clay loam; moderate, very fine, blocky structure; moist, very firm consistency; plastic; terrigenous origin; clear, smooth lower boundary; few fine roots; sterile</td>
</tr>
<tr>
<td>III</td>
<td>120-170</td>
<td>Natural; 10 YR 4/4 (dark yellowish brown); clay loam; moderate, fine, blocky structure; moist, very firm consistency; plastic; terrigenous origin; lower boundary not visible; no roots visible; natural layer with decomposing basalt inclusions</td>
</tr>
</tbody>
</table>
Appendix E-1:
Cultural Impact Assessment
LEAD AUTHORS AND RESEARCHERS

Trisha Kehaulani Watson, J.D., Ph.D.
Kealani Maly

ASSISTANT AUTHORS AND RESEARCHERS

Julie Au, M.A.
Kulani Elizabeth Boyne, B.S.

NOTE ON HAWAIIAN LANGUAGE USAGE

In keeping with other Hawaiian scholars, we do not italicize Hawaiian words. Hawaiian is both the native language of the pā‘aina of Hawai‘i and an official language of the State of Hawai‘i. Some authors will leave Hawaiian words italicized if part of a quote; we do not. In the narrative, we use diacritical markings to assist our readers, except in direct quotes, in which we keep the markings used in the original text. We provide translations contextually when appropriate.

FRONT COVER CREDIT


ABSTRACT

At the request of Crawford Architects, AHL Hawai‘i, and Wilson Okamoto Corporation, Honua Consulting is preparing a Cultural Impact Assessment of the New Aloha Stadium Entertainment District to support a Programmatic Environmental Impact Statement being completed by Wilson Okamoto for the State of Hawai‘i Department of Accounting and General Services. The area of potential effect is approximately 98 acres (4,268,880 square feet) located at TMKs: [1] 9-9-003-061, [1] 9-9-003-055, [1] 9-9-003-070, and [1] 9-9-003-071. The subject parcels are zoned as Residential (R-5) and Urban. The project is proposing to construct a new stadium facility in addition to ancillary development that will serve to create a New Aloha Stadium Entertainment District on the grounds of the existing Aloha Stadium site at Halawa and ‘Aiea. The State of Hawai‘i Department of Accounting and General Services and the State of Hawai‘i Stadium Authority are seeking to minimize environmental and cultural impacts by carefully inventorying the natural and cultural environment and avoiding any significant archaeological sites, cultural resources, and sensitive species.

Research in preparation of this report consisted of a thorough search of Hawaiian language documents, including but not limited to the Bishop Museum mele index and Bishop Museum archival documents, including the Hawaiian language archival cache. All Hawaiian language documents were reviewed by Hawaiian language experts to search for relevant information to include in the report. Documents considered relevant to this analysis are included herein, and translations are provided when appropriate to the discussion. Summaries of interviews with lineal and cultural descendants with ties to the project area are included in the study, and information on other past oral testimonies are also provided herein. Data was extrapolated from these sources that provide an unprecedented comprehensive look at the previous cultural resources on this ‘āina.

This assessment thoroughly identified valued cultural, historical, and natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area, and found that while there are no resources in the direct project area, there are resources in the larger geographic extent. If the mitigation measures presented by the interviews are considered, the project should have no deleterious effects upon cultural practices such as the restoration of Loko Pa‘a‘aua nor resources such as aquifers and natural water flow. It is the recommendation of Honua Consulting to consult with the community and cultural practitioners of the area to allow the New Aloha Stadium Entertainment District’s design to be meaningful to those who reside in the ahupua‘a and larger ‘Ewa moku.
DRAFT Cultural Impact Assessment Report for the New Aloha Stadium Entertainment District
Hālawa and 'Aiea Ahupua’a, 'Ewa District, O‘ahu Island
iii

TABLE OF CONTENTS

LIST OF FIGURES ........................................................................................................................................ VII
LIST OF TABLES ........................................................................................................................................ VIII
ABBREVIATIONS AND ACRONYMS .................................................................................................... IX
1. PROJECT DESCRIPTION ....................................................................................................................... 1
   1.1 PURPOSE AND NEED ...................................................................................................................... 1
   1.2 CONFIGURATION OPTIONS AND DEVELOPMENT SCHEDULE .............................................. 2
2. NEED FOR A CULTURAL IMPACT ASSESSMENT .......................................................................... 5
   2.1 REGULATORY BACKGROUND ................................................................................................... 5
   2.2 COMPLIANCE ............................................................................................................................... 7
   2.3 METHODOLOGY .......................................................................................................................... 7
3. DESCRIPTION OF PROJECT AREA ..................................................................................................... 8
   3.1 PLACES NAMES OF AIEA AND HĀLAWA .................................................................................. 12
   3.2 PHYSICAL ENVIRONMENT ......................................................................................................... 18
   3.2.1 Soil Composition ...................................................................................................................... 18
   3.2.2 Archaeological Sites and Features .......................................................................................... 20
4. CULTURAL HISTORY OF ‘AIEA AND HĀLAWA ........................................................................... 23
   4.1 HE MĀHELEHELE O NĀ M O'UULEO (EXCEPTS OF TRADITIONAL ACCOUNTS) ..................... 23
   4.1.1 He Mele Melelo no Kamapuaa (A Tradition of Kamapuaa)....................................................... 24
   4.1.2 Make i Alohia Nuiua (One Greatly Loved Has Died) ............................................................... 47
   4.1.3 He mea mau i hoahalahala ia no na mea loko o ka na HaoI Hawaii (There are a number of things to criticize in Hawaiian Lore).................................................................................. 28
   4.1.4 Ka Melelo o Kalealehua (The Tradition of Kalealehua)............................................................... 31
   4.1.5 Ka Melelo Hawaii - O kekahi mau i mea mai naona nui ia o ke kupapua (Hawaiian History - Some things which are of importance pertaining to the dead).................................................................................................................. 35
   4.1.6 Ahahula Pu‘uloa, he Ahalehe na Ka‘ahupāhau (The Swimming Trails of Pu‘uloa [Pearl Harbor] are the Trails Traveled by Ka‘ahupāhau)............................................................................................................................ 39
   4.1.7 He Melelo Kano o Halelua no Kalikau o Kau (A Hawaiian Tradition of Kalikau o Kau and the Sharks of Ke Awalau ‘o Pu‘uloa)................................................................................................................................. 44
   4.1.8 He Melelo Hawaii – No aumakua Moom Hawai‘i (Hawaiian History - About the Moo Guardians/Ancestral Gods).............................................................................................................................. 50
   4.1.9 He Melelo Kano o Kalikau o Kalikau o Kau (A Hawaiian Tradition of Kalikau o Kau) ................................................................................................................................. 51
   4.1.10 Ka Melelo Kanoa no ka Puhil o Kalihi (A Tradition of Puhil o Kalihi - A Defied Eel, and how the ‘Ane‘hoo hale o Kawaoua o Pu‘uloa Came to Travel around O‘ahu)................................................. 60
   4.1.11 Ka Melelo Kanoa no Hōkūkāpapolepe (A Hawaiian Tradition of Hōkūkāpapolepe who is Held in the Bosom of Pele).................................................................................................................... 65
   4.1.12 He mele na Kuuli, Kalaipipili, Kalanioua, Kunaiua (A Chant for Kuuli, Kalaipipili, Kalanioua, Kunaiuea).................................................................................................................................................. 67
   4.1.13 Trails and Storied Places of the ‘Ewa District (1805-1811)........................................................ 73
   4.1.14 Place Name Article Series (1883-1884).................................................................................. 75
   4.1.15 Na Wahī Pana o Ewa o Honoalawalae i Keia Wa a Hīlo Oke ke Ieia (Storied Places of Ewa, That are Now Lost and Cannot be Seen)............................................................................................................ 77
   4.2 MĀHELE‘E‘AINA (THE LAND DIVISION) OF 1848 – FREE SIMPLE PROPERTY RIGHTS IN THE AHUPUA‘A OF ‘AIEA AND HĀLAWA ............................................................................................................. 81
   4.2.1 The Kuleana Act of 1850......................................................................................................... 81
4.2.2 Place Names from the Ahupu‘a o ‘Aiea and Hālawa Cited in Records of the Māhele ‘Aiea........................................................................................................................................................................... 84
4.2.3 Summary of Land Use/Residency Practices in the ‘Aiea and Hālawa................................................................................................................................. 85
4.2.4 Māhele and Grant Parcels Cited on Historic Maps Near the Project Area.................................. 86
4.2.5 ‘Aiea Ahupu‘a – Registered Claims ....................................................................................... 87
4.2.6 Hālawa Ahupu‘a – Registered Claims ..................................................................................... 96
4.2.7 Paliapa Sila Nui (Royal Patent Grants on Land)........................................................................ 101
4.3 BOUNDARY COMMISSION PROCEEDINGS: AHUPU‘A OF ‘AIEA AND HĀLAWA ............ 107
5. MODERN HISTORY OF THE PROJECT AREA AND ITS VICINITY BEGINNING WITH FOREIGN CONTACT AND THE CHANGING LANDSCAPE OF ‘EWA DISTRICT .................................................................... 121
   5.1 KAMĀ‘AINA AND VISITORS DESCRIPTIONS – TRAVEL IN THE AHUPUA‘A VICINITY AND LARGER ‘EWA DISTRICT ............................................................................................................................... 121
   5.1.1 Lord Byron at the Sandwich Islands - Extracts from the Diary of James Macrae (1825) .... 122
   5.1.2 Tours made around O‘ahu (1826 & 1829)............................................................................... 125
   5.1.3 A Botanist’s Visit to Oahu - Journal of Dr. F.J.F. Meyen’s Travels and Observations about the Island of Oahu (1831).................................................................................................................. 127
   5.1.4 No Kea Pae Aina: No Kea Hulua Aina o Kanaka (A Census of the People in ‘Ewa) (1835) .................................................................................................................. 131
   5.1.5 ‘Ewa Described in Notes of a Tour Around Oahu (1839).......................................................... 132
   5.1.6 Missionary Recollections of ‘Ewa (1836-1900)...................................................................... 133
   5.1.7 United States Exploring Expedition Investigates “Pearl River” (1840-1844)...................... 139
   5.1.8 Road Development in the ‘Ewa District (1859 & 1859)............................................................ 141
   5.1.9 Settlement and Declining Population in Hālawa (1860).......................................................... 142
   5.1.10 Mele Makena, Kanikau Uwelulu – Recounting Travel to Storied Places in ‘Ewa with a Departed Loved One ............................................................................................................................... 143
   5.1.11 A Journey across ‘Ewa (1868).................................................................................................. 144
   5.1.12 The Catholic Church at Hālawa Destroyed by Fire................................................................. 148
   5.1.13 Travel through the ‘Ewa District (1873).................................................................................. 148
   5.1.14 A Royal Visit Around O‘ahu and Visit to ‘Aiea (1874)............................................................ 150
   5.1.15 A Greatly Loved One Has Died (Noted Places of the ‘Ewa District Cited in Mele) (1876) 151
   5.1.16 Ka Honoa Nei – About the Lay of the Land – The Importance of the Estuaries of Pu‘uloa (1877)................................................................................................................................. 153
   5.1.17 An Itinerary of the Hawaiian Islands with a Description of the Principal Towns and Places of Interest (1880).................................................................................................................... 154
   5.1.18 Environs of Hālawa and the Larger ‘Ewa District Visited (1883)............................................ 157
   5.1.19 A Storm Washes out Bridges in ‘Ewa.................................................................................... 159
   5.1.20 Kāne‘akua’sa Worshiped in ‘Ewa (1885)............................................................................ 160
   5.1.21 Royal Visits to the Mānna-Waimano Peninsula................................................................. 161
   5.1.22 King Kalakaua’s Land at ‘Aiea Sold ....................................................................................... 167
   5.1.23 Ranches and OTHER BUSINESS VENTURES IN THE ‘AIEA-HĀLAWA VICINITY ....... 169
   5.1.24 From Kalo Lands to Rice Fields ........................................................................................... 169
   5.1.25 Conflicts and Transitions in Land Tenure and Land Use ................................................. 171
   5.1.26 Ranches of the Oahu Railway and Land Company [1929].................................................. 187
   5.1.27 PLANTATIONS AND DAVH RAILWAY & LAND COMPANY DEVELOPMENT ......... 198
   5.1.3.1 Land Colonization and Development of Oahu Railway & Land Company (1885-1886) .................................................................................................................................................. 191
   5.1.3.2 O‘ahu Railway Line Extended to Hō‘oe‘ae (1888)............................................................. 192
   5.1.3.3 Oahu Railway & Land Company Condemns Land for Railroad Operations ..................... 195
   5.1.3.4 Development of the O‘ahu Railway & Land Company and Pearl City (1900) ................. 197
   5.1.3.5 Cholera Outbreak in 1895.................................................................................................... 200
   5.1.3.6 Expansion of the O.R. & L. Company Rail and Developments ......................................... 203
LIST OF FIGURES

Figure 1. The ahupua'a within the moku of 'Ewa, O'ahu (1894; S.M. Kanakanui, HGS #1739).................................................. 8
Figure 2. Portion of a 1998 Pearl Harbor U.S. Geological Survey (USGS) Topographic Quadrangle Map, showing the location of the Project Area.......................... 9
Figure 4. Aerial Photo Showing the Location of the Project Area (2011, USGS orthoimagery)..................................................... 11
Figure 5. Portion of a 1998 Pearl Harbor USGS Topographic Quadrangle Map with Soil Series Overlay, showing expected sediment types within and near the project area (Poote et al., 1972)......................................................... 19
Figure 6. Portion of 1998 Waipahu and 1999 Pearl Harbor USGS Quadrangle Maps with Previously Identified Historic Properties in the Vicinity of the Project Area (Turan et al., 2020:52)............................................................... 22
Figure 7. Portion of 1938 Topographic Map of the Island of 'Oahu – 'Ewa District (Library of Congress, No. 2003627043)................................. 24
Figure 8. Map of West Loch and Peninsula of Pearl River with Noted Place Names (1873, J. Lidgate, surveyor, Register Map No. 322).......................... 41
Figure 9. Trails of Leeward O'ahu (portion of map by Paul Rockwood, based on narrative descriptions penned by John Papa Ti, 1959:96)................................. 74
Figure 10. 'Aiea, 'Ewa, O'ahu (1874, C.J. Lyons, Register Map No. 323, for the Commissioners of Crown Lands, State Survey Division).......................... 108
Figure 11. Hālawa, 'Ewa, O'ahu (1848, T. Metcalf, Register Map 109 for Dr. Rooke, State Survey Division)................................................. 109
Figure 12. Oahu Railway & Land Company Time Table (The Pacific Commercial Advertiser, 1889b:2)................................................................. 163
Figure 13. Map of the Pearl Harbor Yacht Race Route (The Pacific Commercial Advertiser, 1902a:13)................................................................. 185
Figure 14. Portion of the Island of Oahu (1902, W.E. Wall, Surveyor)...................................................................................... 193
Figure 15. Sketch Showing Location of Present Government Road and Proposed Road through a portion of the Halawa and Aiea tracts crossing the lands of the Honolulu Sugar Co. Aiea, Oahu, HI (1899, Register Map No. 1966, D.L. and W.E.W., State Survey Division).................................................. 211
Figure 16. Map of the Property of the Honolulu Sugar Co. Aiea, Oahu (n.d., Register Map No. 2643, J.H. Taylor State Survey Division)........................... 212
Figure 17. Portion of Aiea Ahupua'a Conveyed through Land Patent Grant No. 4270 to the Honolulu Sugar Company, with Outline of the Proposed Government Road Realignment (1898, Register Map No. 1944, M.D. Monsarrat).................................................. 214
Figure 19. Honolulu Plantation Company, Aiea Oahu (Ca. 1915, J.), Williams, View from 'Aiea Fields Across Moku'ame'ame and the Pu'ukohola Heiau (Hawai'i State Archives Photo No. PPWD-18-2-013) .................................................. 244
Figure 20. Preliminary Sketch Showing The Coast Line of the Pearl Lochs, Oahu Hawaiian Islands, From Papers of the Hawaiian Govt. Survey (1873, W.D. Alexander, Library of Congress Chart No. 1800 CT003 211)................................. 246
Figure 21. Sketch Plan of Pearl Lochs Lands (The Pacific Commercial Advertiser, 1901b:2)................................................................. 283
Figure 22. Portion of H.O. Chart #1800 (1901, H.E. Newton, Library of Congress Control No. 2002622183)....................................................... 295
Figure 23. Pearl Harbor Reefs and Channels (The Pacific Commercial Advertiser, 1903b:1)................................................................. 299
Figure 24. The Gunboat Petrel Arrives at Pearl Harbor (The Pacific Commercial Advertiser, 1905:2)................................................................. 303
Figure 25. Map of Pearl Harbor: U.S. Navy and Army Reservations (1907, V. Jacobsen, Map G4382.02:2P4 1907:J3, Hawaii State Archives)............................. 306
Figure 26. Collapse of Drydock No. 1 (February 17, 1913) (The Hawaiian Gazette, 1913:1)................................................................. 318
Figure 27. Ka Ipu Makani o La’amaomao is a historic calabash in the collection at Bishop Museum that was once owned by King David Kalakaua........................................ 340
Figure 28. Location of Loko Pa‘iau (NAVPEC, 2016:1)................................................................................................................. 342

LIST OF TABLES

Table 1. Possible Scenario of Four Phases of Development........................................... 3
Table 2. Selected Place Names of 'Aiea and Hālawa Ahupua'a........................................ 13
Table 3. Previously Identified Historic Properties in the Vicinity of the Project Area................ 20
Table 4. Disposition of the Ahupua'a of 'Aiea and Hālawa as Recorded in the Duke Māhele................................................................................. 83
Table 5. Claims Registered from the Ahupua'a of 'Aiea (31 Claims)........................................ 87
Table 6. Claims Registered from the Ahupua'a of Hālawa (26 Claims)................................ 96
Table 7. Land Patent Grant Issued in the Ahupua'a of 'Aiea ............................................... 102
Table 8. Indigenous and Polynesian-Introduced Plant Species of the Project Area.............. 332
Table 9. Observed Fauna of the Project Area.................................................................. 335
1. PROJECT DESCRIPTION

At the request of Crawford Architects, AHL Hawaii, and Wilson Okamoto Corporation, Honua Consulting is preparing a Cultural Impact Assessment (CIA) of the New Aloha Stadium Entertainment District to support a Programmatic Environmental Impact Statement (PEIS) being completed by Wilson Okamoto for the State of Hawai‘i Department of Accounting and General Services (DAGS). The area of potential effect (APE) is approximately 98 acres (4,260,800 square feet) located at TMKs: [1] 9-9-003:061, [1] 9-9-003:055, [1] 9-9-003:070, and [1] 9-9-003:071. The subject parcels are zoned as Residential (R-5) and Primary Urban Centers; pursuant to the June 2004 Primary Urban Center Development Plan, the overarching planning goal is to enhance livability while accommodating moderate growth. The project is proposing to construct a new stadium facility in addition to ancillary development that will serve to create a New Aloha Stadium Entertainment District on the grounds of the existing Aloha Stadium site at Hālawa and ‘Aiea. DAGS and the State of Hawai‘i Stadium Authority are seeking to minimize environmental and cultural impacts by carefully inventorying the natural and cultural environment and avoiding any significant archaeological sites, cultural resources, and sensitive species.

The project area currently consists of the existing stadium and its surrounding surface parking lots, the future Hālawa/Aloha Stadium Rail Transit Station, and two undeveloped strips of land. TMK [1] 9-9-003:061 contains the stadium facility and surrounding parking areas of approximately 7,476 stalls. The parking lots are the sites for several events including the Aloha Stadium Swap Meet, the annual 50th State Fair, cars shows, and auto/motorcycle racing.

The future Hālawa/Aloha Stadium Rail Transit Station, which is currently under construction, will be located on the ‘Ewa side of the project site along Kamehameha Highway on TMK [1] 9-9-003:071, and is expected to be completed in 2020. It is planned to consist of a bus transfer station, a HandiVan drop-off, a kiss-and-ride, and 600 park-and-ride spaces. The integration of this rail transit station within the project area provides a unique opportunity to leverage the increased transit options for stadium operations and for transit-oriented development (TOD).

The PEIS, which is under preparation, will provide an overview analysis of the benefits and adverse impacts of the proposed Aloha Stadium Master Plan to the Hālawa and ‘Aiea area (traditional land division usually extending from the uplands to the sea) in the ‘Ewa moku district and its adjacent communities. The PEIS will examine the interaction of the proposed project and assess cumulative effects; when project level issues are determined, the PEIS may need to be followed by subsequent project-level environmental review documentation which may take the form of a Supplemental EIS, Environmental Assessment, Environmental Assessment exemption, etc. The PEIS and Master Plan will provide critical disclosures, guidance, conditions, and best management practices in the development of a Request for Proposals (RFP), which will then be issued seeking a developer(s) to form a partnership with the State of Hawai‘i in the redevelopment and operations of Aloha Stadium, utilizing a Public-Private-Partnership (P3) model.
1.1 Purpose and Need

Aloha Stadium currently exhibits signs of aging, code non-compliance and amenity deficiencies. While serving the state and community for the past 45 years, the facility is well beyond its practical life as a multi-purpose stadium and requires considerable ongoing investment to keep it in working order, accessible to all users, and safe to the public. There are considerable deferred maintenance items to address that highlight the stadium’s obsolescence.

Since 2008, the State has spent approximately $1.17 million towards maintaining the existing stadium. Continued maintenance costs are estimated to grow at a rate of approximately 5% per year, while construction of a new stadium facility is estimated to cost $234.5 million (ex).

The existing Aloha Stadium limits the range of events that the State is able to attract because it lacks premium amenities, is too large to operate efficiently for many events, and the playing surface is unequipped for additional sporting uses, such as international soccer. A new stadium on the ‘Ali‘i/Hālawa site will eliminate the deficiencies inherent with the existing facility while providing the community with a much-needed, modern, multi-purpose sports and entertainment venue that enhances the community’s use and engagement with the site for many years to come.

1.2 Configuration Options and Development Schedule

A new Aloha Stadium facility is being considered on or near the stadium’s current location. The master plan has identified three possible stadium locations and resultant configurations for associated ancillary development that may include: cultural, educational and recreational facilities; an entertainment district; mixed-use retail space; residential units; and hotel accommodations. This holistic approach will ensure the preferred development yields a viable and vibrant mixed-use development underpinned by a modern multi-purpose sports and entertainment venue while maintaining the site’s historical significance and importance as a gathering place for the wide range of stakeholders. While each option is differentiated, most notably by where the new stadium is located on the site, all three envision a phased approach to the development of the entire site over time.

Option A:
A new stadium is located exactly where the current facility sits. A phased redevelopment scenario will see the old stadium progressively removed and replaced with new construction, facilitating uninterrupted use throughout the removal and construction cycle. An entirely new facility will be realized at the completion of the final phase.

Option B:
A new stadium is built due west of the existing facility. The existing stadium can remain operational while the new facility is constructed. At the conclusion of construction, stadium operations move into the new venue and the old stadium is removed. The bowl-shaped depression remaining after removal is reprogrammed as an outdoor performance venue and community recreation space.

Option C: As with Option B, the existing stadium remains operational throughout construction of a new stadium to the south. The site of the old stadium and surrounding circular parking area are reconfigured into a more regular street grid, defining a new central recreation space.

All master plan options envision a new stadium and up to four phases of ancillary development until the entire site is built out to capacity over time. (Diagrams of these master plan options are provided in Appendix A.)

The entire project site represents a large redevelopment opportunity promising significant community, cultural, recreational, and economic benefits. To ensure these impacts are managed responsibly, the market absorption rates, now and in the future, must be considered to preserve and enhance the value of the site for the entire community. To that end, the master plan, regardless of the option ultimately selected, will comprise a first phase delivery (Phase 1) of mixed-use elements in addition to a new stadium. Subsequent phases (Phase 2 through Phase 4) will be delivered over time as market conditions and other factors formulate. Appendix B provides an example of the phases of development for one of the design options (Option B).

Table 1 represents one possible scenario of a first phase of development (Phase 1), followed by three subsequent phases. Phase 1 is approximately 1.65 million sf of building area spread across several building types, including approximately 635,000 sf of stadium building area. Ultimately, the entire site is easily capable of sustaining over 4 million sf of building area, parking and open space.

<table>
<thead>
<tr>
<th>TARGET</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail (sf)</td>
<td>200,000</td>
<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
<td>650,000</td>
</tr>
<tr>
<td>Entertainment (sf)</td>
<td>100,000</td>
<td>75,000</td>
<td>50,000</td>
<td></td>
<td>225,000</td>
</tr>
<tr>
<td>Office (sf)</td>
<td>100,000</td>
<td>100,000</td>
<td></td>
<td></td>
<td>200,000</td>
</tr>
<tr>
<td>Civic (sf)</td>
<td></td>
<td>200,000</td>
<td></td>
<td></td>
<td>200,000</td>
</tr>
<tr>
<td>Stadium (sf)</td>
<td>635,000</td>
<td></td>
<td></td>
<td></td>
<td>635,000</td>
</tr>
<tr>
<td>Hotel (rooms)</td>
<td>200</td>
<td>300</td>
<td></td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>Hotel Mgt. Space (sf)</td>
<td>30,000</td>
<td>40,000</td>
<td></td>
<td></td>
<td>70,000</td>
</tr>
<tr>
<td>Residential (units)</td>
<td>500</td>
<td>400</td>
<td>400</td>
<td>500</td>
<td>1,800</td>
</tr>
<tr>
<td>Parking (cars)</td>
<td>4,500</td>
<td>2,400</td>
<td>2,400</td>
<td>2,800</td>
<td>12,100</td>
</tr>
<tr>
<td>Total SF</td>
<td>1,656,000</td>
<td>850,000</td>
<td>801,500</td>
<td>700,000</td>
<td>4,007,500</td>
</tr>
</tbody>
</table>

*Allow approx. 455sf per hotel room & 1,000sf per residential unit
The three diagrams in Appendix A represent how the full development of approximately 4 million sf of building area can be accommodated on the site relative to the three options (A, B & C) for the new stadium location as previously described.

2. NEED FOR A CULTURAL IMPACT ASSESSMENT

2.1 Regulatory Background

Articles IX and XII of the State Constitution, other state laws, and the courts of the state require government agencies to protect and preserve cultural beliefs, practices, and resources of Native Hawaiians and other ethnic groups. To assist decision makers in the protection of cultural resources, Chapter 343, Hawaii Revised Statutes (HRS) and Hawaii Administrative Rules (HAR) § 11-200 rules for the environmental impact assessment process require project proponents to assess proposed actions for their potential impacts to cultural properties, practices, and beliefs.

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

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

2.2 Compliance

The State and its agencies have an affirmative obligation to preserve and protect Native Hawaiians’ customarily and traditionally exercised rights to the extent feasible. State law further recognizes that the cultural landscapes provide living and valuable cultural resources where Native Hawaiians have and continue to exercise traditional and customary practices, including hunting, fishing, gathering, and religious practices. In Ka Pa’ukai, the Hawai’i Supreme Court provided government agencies an analytical framework to ensure the protection and preservation of traditional and customary Native Hawaiian rights while reasonably accommodating competing private development interests. This is accomplished through:

1) The identification of valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area;

---

1 Article XII, Section 7 of the Hawai‘i State Constitution, Ka Pa‘ukai O Ka ʻĀina v. Land Use Commission, 94 Haw. 31 [2000] (Ka Pa‘ukai), Act 50 SLH 2000.
Need for a Cultural Impact Assessment

2) The extent to which those resources—including traditional and customary Native Hawaiian rights—will be affected or impaired by the proposed action; and
3) The feasible action, if any, to be taken to reasonably protect Native Hawaiian rights if they are found to exist.

The CIA was prepared under HRS Chapter 343 and Act 50 SLH 2008. The appropriate information concerning the ahupua'a of Hālawa and 'Aiea has been collected, focusing on areas near or adjacent to the project area. A thorough analysis of this project and potential impacts to cultural resources, historical resources, and archaeological sites is included in this assessment.

The present analyses of archival documents, oral traditions (oli (chants), mele (songs), and/or hula (dance)), and Hawaiian language sources including books, manuscripts, and newspaper articles, are focused on identifying recorded cultural and archaeological resources present on the landscape, including: Hawaiian and non-Hawaiian place names; landscape features (ridges, gulches, cinder cones); archaeological features (kulana parcel walls, house platforms, shrines, heiau (places of worship), etc.); culturally significant areas (viewsheds, unmodified areas where gathering practices and/or rituals were performed); and significant biocultural resources. The information gathered through research helped to focus interview questions on specific features and elements within the project area.

Interviews with lineal and cultural descendants are instrumental in procuring information about the project area’s transformation through time and changing uses. Interviews were conducted with recognized cultural experts and summaries of those interviews are included herein.

The PEIS will provide an overview of cultural and historic resources in the project area using thorough literature review, community and cultural practitioner consultation, and high-level, project-specific surveys. The PEIS will focus on identifying areas in which disturbance should be avoided or minimized to reduce impacts to historic properties or culturally important features. The paramount goal is to prevent impacts through avoidance of sensitive areas and mitigating for impacts only if avoidance is not possible.

Environmental factors potentially influencing the distribution of historic properties will also be evaluated in the PEIS. The resulting data will be analyzed to develop a general settlement pattern model for the area that helps estimate the likely types and distribution of historic properties. The potential significance and required treatment of expected historic properties will also be summarized. The goal of this work is to develop recommendations to assist with future infrastructure planning that minimizes adverse effects upon historic properties.

The Range of Influence (ROI) for impacts to cultural resources and historic properties includes the project area and localized surroundings. This CIA also reviews some of the resources primarily covered by the PEIS and Archaeological Literature Review and Field Inspection (LRFI). It primarily researches and reviews the range of biocultural resources identified through historical documents, traditional knowledge, information found in the

Need for a Cultural Impact Assessment

Hawaiian language historical caché, and oral histories and knowledge collected from cultural practitioners and experts.

2.3 Methodology

The approach to developing the CIA is as follows:

I. Gather Best Information Available

A. Gather historic cultural information from stories and other oral histories about the affected area to provide cultural foundation for the report;
B. Inventory as much information as can be identified about as many known cultural, historic, and natural resources, including previous archaeological inventory surveys, CIAs, etc. that may have been completed for the possible range of areas; and
C. Update the information with interviews with cultural or lineal descendants or other knowledgeable cultural practitioners.

II. Identify Potential Impacts to Cultural Resources

III. Develop Reasonable Mitigation Measures to Reduce Potential Impacts

A. Involve the community and cultural experts in developing culturally appropriate mitigation measures; and
B. Develop specific Best Management Practices (BMPs), if any are required, for conducting the project in a culturally appropriate and/or sensitive manner as to mitigation and/or reduce any impacts to cultural practices and/or resources.

While numerous studies have been conducted on this area, very few have effectively utilized Hawaiian language resources and Hawaiian knowledge. This appears to have impacted modern understanding of this location, as many of the relevant documents are native testimonies given by kānaka Hawai‘i (Hawaiians) who lived on this land.

Puakea Nogelmeier (2010) discusses the adverse impacts of methodology that fails to properly research and consider Hawaiian language resources. He strongly cautions against a monothetic approach that marginalizes important native voices and evidence from consideration, specifically in the field of archaeology. For this reason, Honua Consulting consciously employs a polyhistories approach, whereby all data, regardless of language, is researched and considered (Nogelmeier, 2010). To fail to access these millions of pages of information within the Hawaiian language caché could arguably be a violation of Act 50, as such an approach would fundamentally fail to gather the best information available, especially considering the voluminous amount of historical accounts available for native tenants in the Hawaiian language.
3. DESCRIPTION OF PROJECT AREA

Ewa moku is traditionally divided into 12 ahupua’a, consisting of (from east to west): Hālawa, ‘Aiea, Kalua, Waimalu, Wai‘au, Waimano, Mānana (Iki and Ulua), Wai‘awa, Waipi‘o, Waitele, Hō‘āe‘ae, and Honolulu (Figure 1). The project area is located primarily in the easternmost ahupua’a, Hālawa, but also extends into ‘Aiea along the north-western boundary of the project area (Figures 2, 3, and 4).

The project area is surrounded by large residential and commercial areas, across Kamehameha Highway from Joint Base Pearl Harbor-Hickam and adjacent to the Hālawa Interchange, which is the largest highway interchange in the State of Hawai‘i, converging Interstate Routes H-1 (Queen Lili‘uokalani Freeway), H-3 (John A. Burns Freeway), H-201 (Moanalua Freeway), and Kamehameha Highway (Route 99), which collectively provide access to urban Honolulu, Ko‘olaupoko, ‘Ewa, and Central O‘ahu.

Figure 1. The ahupua’a within the moku of ‘Ewa, O‘ahu (1894, S.M. Kanakanui, HGS #1739)

Figure 2. Portion of a 1998 Pearl Harbor U.S. Geological Survey (USGS) Topographic Quadrangle Map, showing the location of the Project Area
Figure 3. Tax Map Key (TMK): [1] 9-9-003 showing the Project Area (within Parcels 061, 055, 070, 071)

Figure 4. Aerial Photo Showing the Location of the Project Area (2011, USGS Orthoimagery)
3.1 Places Names of ‘Aiea and Hālawa

The traditional knowledge imbedded in place names reveals the history of place, people, and the depth of their traditions. Although fragmented, the surviving place names describe a rich culture. On these lands are found many place names that have survived the passing of time. The occurrence of place names demonstrates the broad relationship of the natural landscape to the culture and practices of the Hawaiian people. In “A Gazetteer of the Territory of Hawaii,” Coulter observed that Hawaiians had place names for all manner of features, ranging from “outstanding cliffs” to what he described as “trivial land marks” (1935:10). In 1902, W. D. Alexander, former Surveyor General of the Kingdom (and later Government) of Hawai‘i, wrote an account of “Hawaiian Geographic Names.” Under the heading “Meaning of Hawaiian Geographic Names” he observed:

It is very difficult, if not impossible, to translate most of these names, on account of their great antiquity and the changes of many of them have evidently undergone. It often happens that a word may be translated in different ways by dividing it differently. Many names of places in these islands are common to other groups of islands in the South Pacific, and were probably brought here with the earliest colonists. They have been used for centuries without any thought of their original meaning… (Alexander, 1902:395)

History further tells us that named locations were significant in past times and it has been observed that “Names would not have been given to [or remembered if they were] mere worthless pieces of topography” (Handy et al., 1972:412).

In ancient times, named localities served a variety of functions, telling people about: (1) places where the gods walked the earth and changed the lives of people for good or worse; (2) heiau or other features of ceremonial importance; (3) triangulation points such as ko’a (ceremonial markers) for fishing grounds and fishing sites; (4) residences and burial sites; (5) areas of planting; (6) water sources; (7) trails and trail side resting places (o’o’ina), such as a rock shelter or tree shaded spot; (8) the sources of particular natural resources/resource collections areas, or any number of other features; or (9) notable events which occurred at a given area. Through place names knowledge of the past and places of significance was handed down across countless generations. There is an extensive collection of native place names recorded in the mo‘olelo (traditions and historical accounts) published in Hawaiian newspapers. The following narratives provide access to a rich collection of place names from the region.

Hōnua Consulting developed a list of 51 place names from the ahupua’a of ‘Aiea and Hālawa, which includes but is not limited to the following places and terms, to help guide research and analyses (Table 2). The development of this list stemmed from extensive research into a wide range of documents related to the project area. What became clear is that at the time of the Māhe‘e‘aina, few kuleana land applications were submitted by native tenants. In many cases, land divisions would be referred to as both ahupua’a and ‘ili (land section, usually a subdivision of an ahupua’a), depending upon the document. It was also unclear from documents where land was identified as ‘ili as to if the ‘ili were simply a subdivision of larger

---

**Table 2. Selected Place Names of ‘Aiea and Hālawa Ahupua’a**

<table>
<thead>
<tr>
<th>Inoa ‘Āina</th>
<th>Ahupua’a and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Aiea</td>
<td>Ahupua’a. “The small area of low flat land covered by plantation camps, railroad, etc., below the old highway, was formerly in terraces. According to McAllister (44, site 146), Mathison made the following observations on this region in 1821-22:</td>
</tr>
<tr>
<td></td>
<td>“The adjoining low country is overflowed both naturally and by artificial means, and is well stocked with taro plantations, bananas, etc. The land belongs to many different proprietors; and on every estate there is a fishpond surrounded by a stone wall. The neighborhood of the Pearl River is very extensive, rising backwards with a gentle slope toward the woods, but is without cultivation, except around the outskirts to about half a mile from the water. The country is divided into separate farms or allotments belonging to the chiefs and enclosed with walls from 4 to 6 feet high, made of a mixture of mud and stone” (Handy, 1940:81).</td>
</tr>
<tr>
<td>Ana kau pua’a</td>
<td>‘Aiea-Kalāuan. A site described as being situated along the boundary between these two ahupua’as. The name, translated as “cave in which a pig is set” has ceremonial implications, perhaps tied the Makahiki offerings as it is on an ahupua’a boundary (Boundary Commission proceedings, 1869).</td>
</tr>
<tr>
<td>Hālawa</td>
<td>Ahupua’a. “The broad flats extending 1.5 miles below the highway along Hālawa Stream are now under cane but were formerly terraces. The terraces also extended up the flats along the lower courses of Kamananui and Kamanakī Streams which join to form Hālawa, and I am told that there were small terraces farther up both streams. Four and 5 miles inland, dry taro was planted on the banks of gulches” (Handy, 1940:80).</td>
</tr>
<tr>
<td>Haluhale</td>
<td>‘Aiea-Hālawa boundary zone. An ancient burial cave with openings in both ahupua’a (Boundary Commission proceedings, 1869).</td>
</tr>
</tbody>
</table>
### Description of Project Area

<table>
<thead>
<tr>
<th>Inoa 'Āina</th>
<th>Ahupua'a and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helekahi (Halekahi)</td>
<td>Hālawa. Situated along the shore along entrance to Pu‘uloa (Pearl Lochs, 1873; Library of Congress, Map No. 2003627043).</td>
</tr>
<tr>
<td>Iholena</td>
<td>'Aiea-Hālawa boundary zone. An area situated in the uplands, there were once houses and workshops of olonā (<em>Touchardia latifolia</em>, a native shrub) and canoe makers here.</td>
</tr>
<tr>
<td>Kā‘eo</td>
<td>'Aiea. A dry land site near the shore, along boundary of 'Aiea and Kalauao; near former house site of Dr. Seth Ford.</td>
</tr>
<tr>
<td>Kahakupōhaku (Moleo Kahakupōhaku)</td>
<td>Hālawa-'Aiea boundary zone. A fishpond and large stone in the wall between Kahakupōhaku and Kalāpā‘ia fishponds; marking the boundary between these two ahupua‘a.</td>
</tr>
<tr>
<td>Kahalekahe</td>
<td>'Aiea-Hālawa boundary zone. An ala pili (trail to uplands) rises on the bluff, between the two ahupua‘a at this place (Boundary Commission proceedings, 1869).</td>
</tr>
<tr>
<td>Kalāpā‘ia</td>
<td>Hālawa. A fishpond boundary between Hālawa and 'Aiea.</td>
</tr>
<tr>
<td>Kalenaaka‘uhanu</td>
<td>Hālawa-Moanalua boundary zone. This site situated on the inland side of Aliamanu, by Kapukaki and Leiolono is a leaping place for the spirits of the dead (leina a ka ‘uhanu). Some passed this leaping place, went on to the care of their ‘ao‘umua (family god), others, who had no one to help them, drifted down to Kaup‘a, Kama‘oma‘o, and Kānehili (the plains around Pu‘u o Kapolei), where they would wander aimlessly in hope that someone would direct them to the spirit world.</td>
</tr>
<tr>
<td>Kaluawai (Kaluiwi)</td>
<td>'Aiea-Kalauao boundary zone. A plain land and an ancient maika (ancient Hawaiian game similar to bowling) field and place where offerings to the Makahiki (ancient festival beginning about the middle of October and lasting four months) god were made. Situated below the government road (Boundary Commission proceedings, 1869).</td>
</tr>
</tbody>
</table>

### Description of Project Area

<table>
<thead>
<tr>
<th>Inoa 'Āina</th>
<th>Ahupua'a and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaluia‘ula</td>
<td>'Aiea-Kalauao boundary zone. An upland canoe maker’s house and work shop site (Boundary Commission proceedings, 1869).</td>
</tr>
<tr>
<td>Kapu‘ilāula</td>
<td>Hālawa. A coastal site where the bodies of sharks were tossed during a battle between the sharks of Pu‘uloa and Kī‘ikauaokā‘u. Kapuu‘ilāula is a canoe landing and marks the narrowest point in the channel between Hālawa and Pu‘uloa, for the entry to Ke awa lau o Pu‘uloa (Pearl Harbor). Cited in traditions and historical accounts.</td>
</tr>
<tr>
<td>Kapukā‘u</td>
<td>Hālawa-Moanalua. A wahi pana (sacred and legendary place) boundary marker between the Kona and ‘Ewa Districts; situated on the upland side of Aliamanu near an ancient burial ground (see also Kaleina‘ka‘uhane and Leiolono).</td>
</tr>
<tr>
<td>Kapukakahokohe</td>
<td>'Aiea-Hālawa boundary zone. Kapukakahokohe is situated on the coastal flats. It was near here where Kalanimanu‘ia (w.c) died (Boundary Commission proceedings, 1869).</td>
</tr>
<tr>
<td>Kapu‘ihehu</td>
<td>'Aiea-Hālawa boundary zone. An ancient house site in the uplands (Boundary Commission proceedings, 1869).</td>
</tr>
<tr>
<td>Kapuniakai‘a</td>
<td>'Aiea-Kalauao boundary zone. A point on shore, adjoining Pa‘ai‘au marking the boundary between these two ahupua‘a.</td>
</tr>
<tr>
<td>Kauahi‘pu‘upu‘u</td>
<td>'Aiea-Kalauao boundary zone. A hillock (‘ahu‘a) passed by the government road (Boundary Commission proceedings, 1869).</td>
</tr>
</tbody>
</table>
### Description of Project Area

<table>
<thead>
<tr>
<th>Inoa 'Āina</th>
<th>Ahupua'a and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keahualoe'oa</td>
<td>'Aiea-Halawa boundary zone. Referred to by elder native witnesses in the 1869 Boundary Commission proceedings as a &quot;storied place&quot;: &quot;...hiki i kahi awawa i kapaa o Waipia mai ila a hiki i Keahualoe he wahi pana ia, he Ahua a, holo mai a ke Awaawa o Kaawill mai ila a Naillii a Malei...&quot; (then reach the gulch called Waipa, and from there to Keahualoe, a &quot;wahi pana&quot; (storied place), a stone mound, from there go to the gulch of Kaawill, and from there to Naillii a Malei...)</td>
</tr>
<tr>
<td>Keanapua'a</td>
<td>Halawa. Site of a fishpond made by Kāne and Kanaloa. Also, a famous cave on the coastal point and resting place of the demigod, Kamapua'a. The cave was later used by fishermen as a shelter. Cited in the traditions of Kamapua'a and Ka Loea Kalaiaina (1899-1900).</td>
</tr>
<tr>
<td>Kepoho (Kapoho)</td>
<td>'Aiea. A named locality. Cited in claims of the Māhele.</td>
</tr>
<tr>
<td>Komoa (Komoa)</td>
<td>Halawa. Named for a guardian shark who was the watchman or keeper of the gate into Ke Awalau o Pu'u'uka. He lived in the cave called Ke'a'ili and kept man-eating sharks out of the region. Also identified as being the estuary channel leading into the eastern section of Ke Awalau o Pu' aloa. Now known as the &quot;Halawa Branch.&quot; Cited in Saturday Press, Dec. 29, 1883; and in Ka Loea Kalaiaina (1899-1900).</td>
</tr>
<tr>
<td>Kūhaua</td>
<td>Halawa. An island across from Moku'u'ume'ume, forming the South East Loch and inland boundary of Loko Kūnānā (Pearl Lochs, 1873; Library of Congress, Map No. 2003.627043).</td>
</tr>
<tr>
<td>Kumualua</td>
<td>Halawa-Moanalua boundary zone. Situated on the former shore line, just above the place called Pālani. Cited in the tradition Pūhi o Laumeiki (Manu, 1895-1896). A named locality cited in claims of the Māhele.</td>
</tr>
<tr>
<td>Kūnānā (Loko Kūnānā)</td>
<td>Halawa. A fishpond and detached parcel on the Halawa coastal flats.</td>
</tr>
</tbody>
</table>
3.2 Physical Environment

The elevation of the APE is approximately 36 feet (11.1 meters) above mean sea level (AMSL). The annual high temperature is 80°F (26.7°C) and the annual low temperature is 64.1°F (17.8°C) (Weather Atlas, 2019). Average precipitation is 4.58 inches (11.63 cm), where the wettest month is January with an average of 7.4 in (18.8 cm) and the driest month is June with an average of 1.9 in (4.83 cm) (Weather Atlas, 2019).

The project area is mostly comprised of the Stadium itself and surrounding parking lots, but will include the parcel in the south-west that encompasses the site of the Honolulu Authority for Rapid Transportation (HART) station. Hālawa Stream crosses the south-eastern portion of the project area in the existing parking lot, where the stream is confined within a concrete channel below the general site elevation; Hālawa Stream extends beyond the project area and empties into East Loch, Pearl Harbor to the west.

Due to the previous development of these parcels, the project area was observed to be predominantly comprised of landscape plantings and scattered woody growth during the plant survey (Guinther and Luke, 2019). Natural growth was observed within the Hālawa Stream Channel and around the perimeter of the stadium property. Of the flowering plants surveyed, two were determined to be native species – milo (Thespesia populnea) and ‘uhala (Waltheria indica) – while four were determined to be early Polynesian introductions – kiori (Cordyline fruticosa), ‘alua (Ipomoea batatas), ‘hiʻai (Oxalis corniculata), and ‘ulu (Cocos nucifera) (Guinther and Luke, 2019). Further examination of these native and Polynesian-introduced species is provided in section 7.2.1 of this CIA.

3.2.1 Soil Composition

Soils within the project area include Hanalei Silty Clay (HnB), 2 to 6% slopes, Honouliuli Clay (Hx), 0 to 2% slopes, Kawahalapai Clay Loam (KIA), 0 to 2% slopes, Lahaina Silty Clay (LaA), 0 to 3% slopes, Makalapa Clay (MbB), 2 to 6% slopes, Rock Land (RRK), and Waipahu Silty Clay (WA), 0 to 2% slopes (Foote et al., 1972; Figure 5).

The Hanalei series consists of somewhat poorly drained to poorly drained soils that formed in alluvium derived from basic igneous rock (Foote et al., 1972:38); this soil type is used primarily for taro, pasture and vegetables. The Honouliuli series consists of deep, well drained soils that formed in alluvium weathered from basic igneous rocks (Foote et al., 1972:43); irrigated sugarcane as well as natural vegetation primarily use these soils. The Kawahalapai series consists of well drained soils that formed in alluvium derived from basic igneous rocks (Foote et al., 1972:63); this soil type is used primarily for natural vegetation like kiawe (Prosopis pallida) and bermondagness (Cynodon dactylon). The Lahaina series consists of very deep, well drained soils that formed in residuum weathered from basic igneous rock (Foote et al., 1972:78); pineapple and irrigated sugarcane are primarily grown on this soil type. The Makalapa series consists of moderately deep, well drained soils on uplands that formed in material weathered from volcanic tuff (Foote et al., 1972:87); this soil type found primarily in urban development, military reservations and pasture. The Rockland

Figure 5. Portion of a 1998 Pearl Harbor USGS Topographic Quadrangle Map with Soil Series Overlay, showing expected sediment types within and near the project area (Foote et al., 1972)
3.2.2 Archaeological Sites and Features

Cultural Surveys Hawai‘i (CSH) conducted an LRFI report to comply with HRS Chapter 6E. Historic properties in the vicinity of the project area are listed and described in the following table (Turrant et al., 2020:53-54) (Table 3); some sites are identified by their State Inventory of Historic Places (SIHP) numbers. Following Table 3 are maps identifying the historic sites and traditional sites in the vicinity of the project area (Figures 6). A detailed description of the historic sites and previously archaeological studies in the vicinity of the area is provided in CSH’s LRFI report (Turrant et al., 2020); no evidence or potential historic properties were observed during the study’s field inspection.

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

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Type</th>
<th>Comments</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>McAllister Site 109</td>
<td>Loko Ta: Loko Opu</td>
<td>Has not been completely filled. It was 10.5 acres and apparently completely surrounded by a wall 2,700 ft. Was built by Kalaimanua.</td>
<td>McAllister, 1933:103</td>
</tr>
<tr>
<td>50-80-13-01356</td>
<td>U.S.S. Bowfin (SS-287)</td>
<td>Submarine used during World War II at Pearl Harbor</td>
<td>National Register #82000149</td>
</tr>
<tr>
<td>50-80-13-01384</td>
<td>Commander-in-Chief of the Pacific Fleet (CINCPAC FLT) Headquarters</td>
<td>–</td>
<td>National Register #87001295</td>
</tr>
<tr>
<td>-4892</td>
<td>Pohaku o Ki'napaka Place, 'Aiea</td>
<td>A storied boulker with a legend related by kumu hula (hula teacher) John Ka'imikaua</td>
<td>Napoka, 1994</td>
</tr>
<tr>
<td>50-80-09-5306</td>
<td>Possible heiau, one historic house platforms, a stone wall, and several burial structures (two family plots, three mounds, one concrete enclosure)</td>
<td></td>
<td>Cluff, 1970</td>
</tr>
<tr>
<td>50-80-12-09714</td>
<td>O.R. &amp; L. Co. right-of-way</td>
<td>Historic property extends along the coast in the vicinity of the project area westward, (documented to the west in various studies)</td>
<td>Hammatt and Chigioji, 1997</td>
</tr>
<tr>
<td>50-80-13-09992</td>
<td>Pearl Harbor Naval Base National Historic Landmark</td>
<td>–</td>
<td>National Register #66000940</td>
</tr>
<tr>
<td>Historic Cemetery</td>
<td>'Aiea Cemetery (twentieth century burials)</td>
<td>Approximately 1.5 acres, established by the Honolulu Plantation Co. and owned by the State of Hawai‘i; actively maintained</td>
<td>Sroat et al., 2012</td>
</tr>
</tbody>
</table>

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

Site Number | Type                          | Comments                                                                 | Reference             |
---|---|---|---|
McAllister Site 101 | Loko ta' (lighthouse): Makalapa Crater | Lake within crater | McAllister, 1933:102 |
McAllister Site 102 | Loko ta'; Loko Kunana and Loko Muliwai | Loko Kunana: Kaahua Island forms one side, walls from shore to island are 1,800 ft and 1,950 ft long, approx. 5 ft wide and 3 ft high; Loko Muliwai: Wall is 500 ft long with one mākahā (sluice gate) | McAllister, 1933:102 |
McAllister Site 104 | Loko ta'; Loko Kahakupono | Small pond of 3 acres with a semicircular wall of evenly spaced basalt 1,050 ft long, 5 ft wide, 3.5 ft high, without mākahā; also named "Kahakopohaku" and "Kakupohaku" | McAllister, 1933:102 |
McAllister Site 108 | Loko ta': Loko Pa'aianu | Rectangular in shape, roughly 190 ft by 600 ft, surrounded by land on three sides. The harbor side wall is 3-4 ft wide, 2 ft high with one mākahā. The three sides toward the land have been evenly faced with water worn basalt to a height of about 2 ft. The pond was evidently fed by the water from the surrounding lo'i kalo (taro patch). Tradition credits its construction to Kalaimanua. | McAllister, 1933:103 |
4. CULTURAL HISTORY OF ‘AIEA AND HĀLAWA

This document incorporates diverse facets of history from the ahupua’a of ‘Aiea and Hālawa in the Moku of Ewa (Figure 7). The cultural-historical narratives herein reveal a legacy of place-based knowledge and stewardship, that will provide access to authentic, accurate and culturally rich information that can be used to enrich the project as it progresses in a manner that honors the extraordinary history of this land and its people.

The narratives in this manuscript focus on a collection of many notable traditions and histories as well as the diverse history of the land and people for the subject ahupua’a, including the period of early Hawaiian residency to the modern day. The nature of Hawaiian history makes it necessary that accounts from neighboring ahupua’a, larger regions, and even cross-island be cited as well. We start first with the history of the native Hawaiians from antiquity to the present-day, and then integrate the layers of history following Western contact.

While hundreds of place names and primary source historical accounts (from both Hawaiian and English language narratives) are cited on the following pages, it is impossible to tell the whole story of these lands in any given manuscript. A wide range of history, spanning the generations, has been covered. Importantly, the resources herein are a means of connecting people with the history of their communities—that they are part of that history. Knowledge of place will in turn promote appreciation for place and encourage acts of stewardship for the valued resources that we pass on to the future.

4.1 He Māheleho’e Nā Mo’olelo (Excerpts of Traditional Accounts)

Research provides a number of site-specific traditions and historical accounts to the ahupua’a for which this study has been developed. A larger portion of the history is linked with the history of neighboring lands of the larger ‘Ewa District—notably with Ke Awa‘au o Pu‘ulua (The Many Bays or Lochs of Pu‘ulua or Pearl Harbor)—and in some cases connected to events in history across the pae ‘āina (island group). As a result, many of the citations that follow include other notable places. Hawaiian mo‘olelo (traditions and historical narratives) share expressions of native beliefs, customs, practices, and history.

The narratives are generally organized chronologically, by period of time or by the events being described, such as when the gods walked the land, touching the lives of the people, or when chiefs engaged in conflicts on the land. In some instances when the mo‘olelo span generations speaking of the transmission of traditional knowledge and beliefs, the narratives in history are linked together. It will also be noted that in a number of instances, wahi pana (storied and sacred landscapes) were named in the traditions as a means of commemorating notable events in history. Underlining is used throughout the texts to identify notable place names or references in the quoted narratives as a means of highlighting history of place.
4.1.1 He Moolelo no Kamapuaa (A Tradition of Kamapuaa)

S.W. Kahlo contributed the tradition of Kamapua’a to the native newspaper Ka Hae Hawaii in 1861 (the original Hawaiian texts may be viewed in the Hawaiian digital library at www.uku.aka.org). This is the earliest detailed account of Kamapua’a, a multi-formed deity of traditional significance on O‘ahu, and all the major islands of the Hawaiian group. The Hawaiian deity Kamapua’a is a part of the Lono god-force and possessed many kūhōlau (body forms), representing both human and various facets of nature. He was born in pig-form to Hina (mother) and Kahiikiula (father) was born at Kahu‘uai in the Ko‘olau Ioa District of O‘ahu.

August 7, 1861

...Kamapuaa walked to Kana‘puaa, on the shore at Halawa, and he slept there. When he woke up from his sleep, he urinated in the sea, and that is why the fish of Puluoa have a strong smell to them, so say the uninformed.

From there, he went to Honolulu and saw his grandmother, Kamau‘uanaho, sitting along the side of a taro pond field. She was looking with desire to the lands below, where some of the men of the king were working and wishing that they would leave even a little bit of taro behind for her to eat. Kamapuaa

2 The tradition provides readers with an account of all the land names beginning with “Wai,” as being lands dedicated to the class of Lono priests. We suggest here, that the name “Waianu” was unintentionally omitted during publication in 1861.
then went and stood next to her and greeted her. She replied, greeting him, but did not recognize him as her grandson. He then asked her why she was sitting there. She told him, “I am looking to the lowlands, where the men of the chief are working, and wishing that they would leave a little behind so that I may have some food.” Kamapuaa then said to his grandmother, “How did you live before?”

She answered, “What is it to you? My grandchildren have died, one in a battle with Pele, another buried, and one on Kaua.” This is how she spoke, not understanding that the one before here was her own grandson. Kamapuaa then answered, “I am going to get some food for me.” She asked, “Where will you get your food?” He told her, “I will go and perhaps ask for some, and maybe they will give me some of their food.

August 14, 1861
Kamapuaa went and said to one of the men who was pulling taro, “Let the two of us pull taro for us.” The man agreed, and the two of them pulled, some for the man and some for Kamapuaa. Kamapuaa pulled a large quantity and then carried it up to his grandmother. Because of the large load that he carried, Kamauhanio suspected that the man was indeed her own grandson, Kamapuaa. She chanted a song to Kamapuaa and he chanted to her as well. Together, they carried the taro to the house she shared with another old woman, at Puokapolei. Setting down their bundles of taro, Kamauhanio placed Kamapuaa on her lap and wept over him. The two were joined by the other old woman and she was introduced to Kamapuaa, who she thought had been lost. Preparations were made for a meal, and Kamapuaa and the old woman went out to her garden to collect sweet potatoes. They then returned to the house and ate...

August 21-28, 1861
...Kamapuaa went to Nuuau and performed a ceremony, bringing his brother, Kekeleiaiku, back to life. He then traveled to Kou where he killed the chiefs and people who had killed his brother and forced his family into their live of despair. Returning from Kou, Kamapuaa met his friend Kuolohoe and the two of them walked from Moanalua. They reached Waiwai and continued on to Waipahu. Standing on the edge of the stream there, Kuolohoe went to bath in the stream. Kamapuaa noticed that Kuolohoe had a large lump (puu) on his back. Picking up a stone, Kamapuaa struck the lump on Kuolohoe’s back.

Kuolohoe cried out, thinking that he was about to be killed. Kamapuaa reassured him that he was not going to die, but that instead, he would be healed. He then instructed Kuolohoe to touch his back. In doing so, Kuolohoe found that the lump was gone.

Kamapuaa then picked up the stone and set it on the cliff-side. That stone remains there at this time, and it is a stone which many travelers visit [the stone is named Kuolohoe]. Kuolohoe and Kamapuaa continued traveling together for a short distance, until Kuolohoe reached his destination. Kamapuaa continued to Puokapolei, where he met with his grandmother and brother. He told them what had transpired, and then he set off for Kaaai, to bring his parents back to Oahu...

4.1.2 Make i Aloha Nuiia (One Greatly Loved has Died)

A lamentation for P. Kauhi, celebrating famed places visited by him and his sister during his life time. The mele includes references to wahi pana from Moanalua to Waipi'o:

Ka Nupepa Kuokoa
Make i Aloha nuiia

June 9, 1866 (aoao 4)
Make o P. Kauhi he 40 ka nui o kona mau makahiki. O kokahi keia o na keiki i aloha nui ia e ka Makua a me ka leahale h a pau, no ka oholo o ka noho ana me ka makua, a ua hala aku ia i ke ahi o holoholo mai; ke kumu o kona mai i make ai, he nahu hikikwawe loa, nolalal a hakul ho a makou i keia mai la lani mele malalo iho nei. Penei no ia:

...Karikau aloha no P. Kauhi, Kuu kaiikune mai ke kula loa e Kaiwuiula, Mai ke kula mehehena kanaka ole e Kahauiki, He iki ka manao hoomana e ia loko, E wave kau a kimo i ka malu o ke kuku, Luu ka ihu o ka lio a i ka wai o Moanalua, Elua no maua i ke kula e Papakolea, Mai ka piina loa e Kapukaki, Mai ka ihoa kuwala lava e Hala, Ke lihau haheo mai la ka ua i kula o Aiea.

June 9, 1866 (page 4)
P. Kauhi died at 40 years of age. This was one of the children greatly loved by the parents and the multitudes for his gentleness in living with the elders. He has passed along the trail from which there is no return. The cause of his death was a sudden pain. Thus, we have composed these lines for him. They are:

A loving lamentation for P. Kauhi, My elder brother from the long plain of Kaiwi’ula, From the lonely plain, without people at Kahauiki. There is little thought to move on, As we entered the shelter of the kukui grove, The nose of the horse dipped down into the water of Moanalua, We two were there on the plain of Papakolea, Coming from the ascent of Kapukaki, From the undulating descent at Hala, The cherished dew in the rain on the plain of Aiea.
4.1.3 He maau mea i hooalahala ia no na mea Iloko o na Kaoa Hawaii (There are a number of things to Criticize in Hawaiian Love)

Preeminent Hawaiian historian Samuel M. Kamakau authored thousands of pages detailing Hawaiian history in the 1860s. In 1868, he referenced the tradition of the Kana and corrected certain details that had been previously reported. Notably, there are recorded the names of certain chiefly and priestly ancestors who came from Kahiki, and who were the founders of lineages tied to various ahupu'a in the 'Ewa District. Kamakau also referenced the role of kōlea (Pluvialis fulva, Pacific golden-plovers) at Moanalua and Kapapikoale, and their recording the first census of the Hawaiian people. Those were the ancestors of the early chiefly/priestly residents of 'Ewa in the first census of on O'ahu.

Ka Nupapa Kuokoa

Pepeluai 15, 1866 (aoao 3)

E Na Luna Hooonopono o ke Kuokoa e— Ke waiho aku nei ai i ko'u mahalo i ka mea kakaia ao ke kahai maua o ke Nupapa hai haana o ko Lauhi holokoa; a e lilo ana ia i kumu alakai i ko Lathai, i a ko poe opioio, a e lilo ana ia mea e hoaana ao ai i ka hanaau hou aku. Aka, eia ko'u mea kanahau, aole poolei o kekahi maua mea i kihuikahua no ka moolelo o Kana.

O ka moolelo kuauhau o Kana. Aole he oiaio no Hawaii; no o Oahu ko oiaio maoli. O Hua a Kamapau ko lako kupuna, oia ho'i o Huanuikalalahilai ke ali'i i hanau i Kewalo no Honolulu. Na Huanuikalalahilai o Kueailani nana mai o Hakalainee. O Kamaile i Waianae ka aina o Hakalainee.—O Hooohaokahei, ke ali'i wahine no Hilo i Hawaii.

O na keiki i hanau i Oahu, o Kekahawalu, o Kepani, o Ha'a, a me Niihu. O Makaha, i Waianae ka aina o Niihu—O ke keiki hope loa o Kana, aia ma Hanaiana a Kanawa ma Puueo ma Hilo kahi i hanau a i Kana. Ualii ia Uli ka hanau o Kana, i ka makuahine o Hooohaokahei i uka o Kapahuka. E inina i ko Hilo poe kaliko a e loa no ka mua i Hana. Aka, aia ma Oahu ko nui o kona wahi i noko a, e nana ma Kanohe e ko okole ana i Kaulakola, aia ko okole malaha na maka o Kana. Aia ma Kahana, ma ka loke o Huiha kekahai wawae, aia ma Ahu anu ai o Kana kehiki kuli, a kiei ke pono ma ke kahuwio i Punalu'u.

O kau o e nolelo ke kaua kaa, he poe kanaka no Kahiki mai ke poe kanaka a Kolea ma i hai aku ai ia Moi maloko o ko lakou mele helu kanaka. Aole polelei o ia oelelo ana. No o Oahu na kanaka i helu ia. Aole nae polelei loa. E hoomaka ma Waikiki ka helu ana, e helu ia ka nui o na kanaka o kela ahupuaa o keia ahupuaa a puni o Oahu. E Pepemua, o Pepemahope, o Pepeloa, o Pepokamumiu, no Waiawa ia poe kanaka; o Kiele Nahulu no Waipio; O Malamahane no Wailele. O Kaulu no Haoeae; O Lekiapokiki no Honolulu; aole nae i pau pono loa na kanaka. E loaa no keia poe kanaka ma ka hula Pelea a Malakeaakaio.

No Keo loe ma. Aole o Nuakea a me Moi, he mau pilo hoahana no Keo loe ma; no Ewa no Nuakea me Moi, o Laakona ko lako u maia, oia o Ewa a Laakona. O ko lakou makuwahine o Weheli, a o ko lakou makuwahine o Keaumiaumaweke. Ua lilo o Nuakea i wahine na Keoloewa, a ua hanau mai ka laua o Kupau-a-Nuakea, oia ke kuamoo ali ali me ke kuamoo hahuna o Hawaai ma o Kalahumoku ia. No Keo loe ma. O Hinakea ko lakou makuwahine, a o Kamaua ko lakou makuwahine. O Keo loe a Nui a Kamau, o Haili nui a Kamau, o Kapee Nui a Kamau, o Uluhapeau a Maui. Ma o Haili Nui a Kamau, oia ke kupuna o Kaulualuu. O Halli nui a Kamaa noho ia Uluanealo o Kanikianila, noih o Kakaalaneo o Kaulualuu.

He kanaha mele wanana, he kanaha mele hilani, he kanaha mele kaau ko Mio i Wanana ai ilo o na po elima, a o a kele no ka ko poe kokea i helu i na kanaka mai Hawaiia a Kauai, i kela ia i kela la, a i ko po hai ia Moi, Hoolo no o Moi, pela aku no. Aia maluna aku o Moanalua ma ke komohana akau o Kapapakoale, aia maluna o ka pohaku, he hoaia, no ua poe koka ia, e hana no ia ke hele nanao.

Pela no ka moolelo o Hamanaalau, o ka moolelo o Hamanaalau aia ilo o ka moamai o Oahu; o ka moamai o Kukanilailai aia ma ka moamai o Hawaii.

Ina paha e hookapake ae ke kaua moolelo kaa o me na kamu kaa ano i palau mai ai.

I kahuwuanau——
I ka peleu—a—
Lai ki ka maa—na—
Ut—o—ka ale—a.
A Puula—la—
I ke awalau—la—
I Kapakule—a—Kohepalaoa—la.

Pela ka moolelo o Pakaa. Ua pololei ka makanikane aku, he uku ka makanikane haule, aia ma ka moolelo ka hemahema a me na kupuna. O ka pololei loa ma ka moolelo o Keawenuiaumia, e hana aia, he mau lala leia a he nui loa na lala o lala o ka moolelo o Keawenuiaumia no ka hapualu o ka makaikihi a o ai aku.

He pono i ka poe kakau i ke kaa o hooponopono mua i ka moookauiaha a me ka moolelo Hawai’i a maopopo kahi e alakahai aku a i ka Lahui i ka ike a me ka oiao. O ke kakau moolelo a kaa, he kanaka oia i manao nui i ka moolelo Hawai’i, i na moo kauiaha, a me na moookauia kahi o Hawai’i nei.

I ko’u manao, i na e like na kanaka naauao me kela kanaka a hui lokahi e hana i mau Duke moolelo Hawai’i a me na kiao a ki a kioia, alalai, ua pomakai na ‘Lili a me na makaainaina, ua looa ka Duke Hawaii oiao. Ia paha a make ana a, a mahope hui kekahai poe a manao e alakahai i kuu moolelo i kumu alakahai no lakos. Eia ka hemahema, ua haule kekahai mau makaikihi, a ua komohewa ma ka hoomohonoana a ka poe kukulu kepau. O kekahai mau pauku ua haule. No ka mea, hookahi wale no a’u me ka pauhele o i ka haiike i me ka haiiohe. Ina na hai kai walewale a me ka hana a na u ke kaa a kai a Kumulipo mai a hikiki i Moi Kamemamaha III. Aia i ke ooukou i ka moookauiaha i keia mau pule aku paha. No kuu molow, ua kapa kei oe a a’u. Aole paha e looa ka piko a me ke au.

Aloha ooukou, S. M. Kamaku.
Puukoloko, Manua, Kahehuna, Ian. 31, 1868.

Summary — There are a number of things to Criticize in Hawaiian Tales
...It was at Waikiki, that the recitation of people in various ahupua’a around O’ahu began... Pepemua, Pepemahope, Pepeola, and Pepekamuimui, were people of Wai‘awa; Kiele Nahulu was of Wai‘ipio; Malaolaheane was of Waikele. Ka‘ulu was of Ho‘aea; Leikapokii was of Honouliuli; these are not all the people. Others are found in the Pele dance of Māleahu aoka.

About Keolo‘ewa folks. Nu‘akea and Mo‘i were not close relatives of Keolo‘ewa folks. Nu‘akea and Mo‘i were of ‘Ewa, ‘A‘akona came before, that is ‘Ewa a ‘A‘akona. Their mother was Wehelani, and their father was Ke-au-nui-a-Maweke. Nu‘akea became the wife of Keolo‘ewa, and there was born to them, Kupaua-Nu‘akea, this is the lineage of the chiefs and priests and Kalahumoku.

About Keolo‘ewa folks. Hina-ke-kā was their mother, and Kamauaua was their father. There was Keolo‘ewa Nui a Kamau, Hālī Nui a Kamau, Kapepe‘e Nui a Kamau and Uhualalani a Kamai. Hālī Nui a Kamau dwelt with Nu‘amukolo o Kanikanaula, who dwelt with Kaka Aleaneo, to whom was born Ko‘ukuli‘a‘u.

There are forty prophecy chants, forty exaltation chants, and forty scared chants by which Mo‘i prophesied in the five nights, and then the flight of the kōleia (golden plovers) which counted all the people from Hawai‘i to Kaua‘i on each of the days and nights that Mo‘i chanted. While Mo‘i denied it, it was so. It was there, above Moanalua on the north west of Kapakapākōlea atop the stone hōana (sledding track), that those kōlea went about to look...

If the writer of these tales might so sprinkle [tell] the stories and traditions:

At Kaluwaia,
The long canoes
In the beginning
The waves are intertwined
At Pu‘ula
The many bays,
At Kapakule and Kohepalaoa...

Love to you, S. M. Kamaku.
Puukoloko, Manua, Kahehuna, Ian. 31, 1868. [Maly, translator]

4.1.4 Ka Moolelo o Kalelealuaka (The Tradition of Kalelealuaka)

The tradition of Kalelealuak touches on places throughout the Hawaiian Islands. Kalelealuak and his father, Kāpepe possessed supernatural attributes, and their story describes several places in the Honouliuli-Moanalua region. The tradition was published in Ka Nuepea Kuookoa and submitted by J.W.K. Kauakilime (Maly, translator). The original account offers a richer narrative of places and practices than those cited Formerand (Vol. IV 1916:464-471) and Beckwith (1970:415-418). There are several wahi pana named in the tradition, with descriptions of place and how the names were given.

Ka Nuepea Kuookoa

April 9 to April 23, 1870

Kapepe (k) and Makalani (w) were the parents of Kalelealuak (k). Kalelealuak was born on Kauai, the native land of his mother. His father had been born at Waipio, Hawai‘i, and possessed certain supernatural powers. Kapepe was a great cultivator of the land, and he is credited with the planting of large fields on Hawai‘i, Maui, Oahu, and Kauai. On Oahu, it was at Kapakapākōlea in Moanalua, and at Li‘hue (Honouliuli), in the district of Ewa that Kapepe had cultivated large tracts of land. While Kapepe worked the land with great speed, he was also overcome by a deep sleep that lasted for six months at a time. On many occasions, it was thought that Kapepe had died,
and then he would reawaken and resume his tilling of the land. When Makalani became pregnant, Kaopele gave her certain items to identify the child as his own, and shortly before giving birth, Kaopele went to sleep.

April 30, 1870

Kaleleluaika was born and grew quickly. When Kaopele woke up from his sleep, he instructed his son in various techniques of fighting, and Kaleleluaika became known as an exceptional warrior, who moved so swiftly, that no one could even see him... One day, when looking out across the ocean, Kaleleluaika saw a land in the distance, and he inquired of Kaopele, “What land is that?” Kaopele told him that it was “Kaena on the island of Oahu. Kaleleluaika then asked, “What is the village that is there beyond the point?” Kaopele answered, telling him that it was “Waianae.” When Kaleleluaika expressed a desire to travel and see that land more closely, Kaopele made a canoe for his son to travel on.

When preparations were being made for Kaleleluaika’s departure, he befriended a youth named Kahihe, and it was agreed that Kahihe would travel with Kaleleluaika. When everything was made ready, Kaopele told Kaleleluaika:

Sail until you reach the point outside of the village of Waianae, then travel across the plain to a place where there is a pool of water. That will be the pool of Luahalei. They you will ascend the pass of Pohakea, from where you will see the flat lands spread out before you. You may also see the expansive cultivated fields of Keahumoa (Ewa), which I planted before coming to Kauai...

May 7, 1870

Kaleleluaika and Kahihe sailed to Oahu and passed the heiaus of Kanepunu and landed on the shore. There Kaleleluaika was met by a group of youth who were surfing. One of the youth inquired about the journey of the two travelers, and one asked if he might accompany Kaleleluaika and his companion. Kaleleluaika agreed, and the group walked across the plain and found the pool of Luahalei. From there, they then ascended the mountain, to the pass at Pohakea, from where they looked out across the broad flat lands of Keahumoa. Descending the slope, they found a large garden planted in bananas that had been planted by Kaopele.

Kaleleluaika then shot his supernatural arrow (pua), and it flew down slope, passing the plains of Puunahawele and Kekuaoole, and it landed at Kekuaoopai, awaiting Kaleleluaika’s arrival. This was at Waipio, above Ewa. The people of the area saw the flight of the arrow and cried out “Ka paua lele hoi e!” (How the arrow flies!). That is why the place is called “Lele-pua” [Flying-arrow], to this day.

Kaleleluaika stayed in the uplands above Lelepuu, at Kakahepuoi, and asked his companions to go and fetch the arrow. He also told them to gather some clumps of awa and edges for straining it. The two companions went and arrived at the edge of the stream called Kaniakulou, where they saw some women bathing. They asked, “Have you perhaps seen our arrow?” The women denied having seen it, hoping that they might keep it for themselves. Because they had found it and greatly admired its beauty. Sensing that they were lying, Kaliu called out to the arrow, and it leapt from the place at which it had been hidden, into his hands. The women were frightened by this and fled away.

Kaliu and his companion left the stream and arrived at a large house with clumps of awa planted all about it. Looking around, they found no one in the house or in the surrounding lands, so they began to gather some of the awa. While picking the awa, they heard a voice call out to them, “Set aside that which you have taken, or I shall return.” Startled by this command, they dropped the awa and fled, returning to Kaleleluaika, and describing the house, its surroundings, and events to him. They noted that the house was an excellent one, and only lacked sleeping mats inside.

Kaleleluaika had them gather rolled sleeping mats and kapa and they then traveled to the house. Entering the house, they found that all was in order, and they prepared food, ate, and drank awa, with no other voices calling to them. The next day, Kaleleluaika arose, and he and his companions planted large fields with various crops. The field planted by Kaleleluaika extended from the uplands of Kakehepuoi to the lowlands of Puunahawele. When the work was completed they returned to the house and prepared popolo, aheaha, and inamona as their food. These were the only things which presently grew around the house that could be eaten until their own gardens matured. While they were eating, the youth from Oahu, ate with great haste and fervor, and Kaleleluaika called to him, urging him to eat with patience. Because of this, the youth from Oahu, came to be called “Keinohoomanawanui.”

One of the problems in living in the uplands was that there were plenty of plant foods to be had, but there was no fish. One day, while preparing their food, Keinohoomanawanui was making inamona (kuku nut relish). When he struck a broiled kukui nut, the shell flew up and struck him in the eye, blinding him in that eye. Kaleleluaika then took up the task of preparing the food...

May 14, 1870

Kaleleluaika told Keinohoomanawanui, “I will prepare that food which we two desire. Keinohoomanawanui said, “That which I desire are the sweet potatoes of the planted fields below, and the eels of the pond at Hanaloa.” Kaleleluaika told Keinohoomanawanui, that “in time, you will have your desire." Now these foods were the property of the king Kukuhiewa, and they were kapu to all but him and his people. Kaleleluaika told Keinohoomanawanui, “Tomorrow,
Kakuhihewa and his people will arrive here in the uplands of Waipio, to gather wood with which to make new houses in the lowlands.

Now while Kaleleiauka and Keinohoomanawanui were discussing these things, Kakuhihewa himself had come to the uplands to gather some of the awa that grew at Kahuone. Seeing the large house in which Kaleleiauka and his companions dwelled, he quietly drew near and overheard the conversation, curious about what these men were. He set a wooden image in the ground near the house to mark the area, and then departed, returning to Puuola. Kakuhihewa thought about what he had heard, and the bold remarks that they would soon eat the favored eels of Hanaloa. Kakuhihewa spoke of this with his advisors and war leaders, some of whom suggested that a party go to the uplands to kill the impertinent youth.

Instead, Kakuhihewa sent to Waimanaalo (Ewa) for his priest, Napuaikamao. Napuaikamao traveled to Koolina where Kakuhihewa was staying, and listened to the words of his chief, describing the youth and their conversation. Napuaikamao thought about their words, and the symbolism of the desire for the eels of Hanaloa, and discerned that one of the youths was the great warrior, Kaleleiauka, of Kauai. Now at this time, Kakuhihewa was at war with a chief named Kuiali'i, the two kings seeking to rule all of Oahu. Napuaikamao told Kakuhihewa, that it was Kaleleiauka who would bring victory to his side, and that he should prepare a house for the youth and allow them to fulfill their desires.

Kakuhihewa agreed and ordered preparations to be made. He then had his counselor, Maluhahaino go to the uplands of Waipio and invite Kaleleiauka and his companions to the shore...

May 21, 1870

Maluhahaino arrived before the youth, and following a discussion, it was agreed that they would meet with Kakuhihewa... Descending to the coast, they passed the plain of Puunahawele. They then passed below Puukuaa which is near the mountain ridge and descended to the shore of Puuola. Kaleleiauka and his companions were shown the houses and foods that had been prepared for them, and they took up residence at Puuola....

(During this time, the identity of Kaleleiauka, remained hidden from Kakuhihewa and his people. Because the king had heard Keinohoomanawanui speaking about his desire for the eels of Hanaloa, and because Keinohoomanawanui told people that he had been blinded in one eye by a spear, it was assumed that Keinohoomanawanui was the great warrior that they sought.)

Within the passing of several periods of ten days (anahulu), a messenger from the king, Kualii, arrived bearing the message that Kualii challenged Kakuhihewa to a battle on the field at Kanalua [Kaulua], in Moanalua... The warriors met, and a great battle took place in which the champion of Kualii was killed. It was thought that Keinohoomanawanui (mistaken as being Kaleleiauka) had secured the victory for Kakuhihewa... During this battle, Kaleleiauka had stayed behind at Puuola, and after the battle began, ran secretly with great speed to the battle ground, and killed Kualii’s champion...

May 28, 1870

(Battles were also fought at Kulaokahaha and Kahapakaikai, and each time, the victory went to Kakuhihewa’s side.)

At each of the battles between the warriors of Kakuhihewa and Kualii, Keinohoomanawanui was credited with, and accepted the honor of having defeated Kualii’s champions. Because Kaleleiauka moved so swiftly, no one even saw him enter the battle field. Kaleleiauka had stayed behind at Puuola, and secretly entered into the battle, killing Kualii’s champions, and taking their capes and feather helmets, with which he returned to Puuola, hiding the items in his house.

June 4, 1870

At the last battle between Kakuhihewa and Kualii’s champions, the forces met near Waolani, and Kaleleiauka killed all of the warriors of Kualii. Great honor was to be bestowed upon Keinohoomanawanui, but Kaleleiauka arrived before the assemblage and claimed the privilege. Kaleleiauka accused Keinohoomanawanui of deception and challenged him to a fight to prove it. As quickly as the battle began, Keinohoomanawanui was killed, and Kaleleiauka took his head to Maluhahaino.

Seeing that all of his warriors had been killed, Kualii, thought that his life too was forfeit, but Kaleleiauka invited him to live under Kakuhihewa, to which Kualii agreed. The head of Keinohoomanawanui was taken to Puuola [Pearl Harbor region] and then set atop an aa hillock above Kalaaua... Kaleleiauka, Kakuhihewa and Kualii, and their people lived out their days in peace...

4.1.5 Ka Moolelo Hawaii - O kekahi ma u mea i manao nui ia o ke kupapau (Hawaiian History – Some things which are of importance pertaining to the dead)

Care for kupapa'u (the dead), respect of ilina (graves), and traditions associated with the spirit after death are subjects of great significance to Hawaiians – past and present. In his history of the Hawaiian people, Kamakau shared with readers a collection of traditions and practices pertaining to the dead and identified some of the places of importance in these practices. These narratives are of particular importance to lands and specific wahi pana of the Honouliuli-Moanalua region.
Ke Au Okoa
O kekahi mau mea i manao nui ia o ke kupapau.
Okotopa 6, 1870 (aoao 1)

Translation — Hawaiian History: Some things which are of importance pertaining to the dead
There is only one famous hiding cave, ana huna, on Oahu. It is Pohukaina. The opening on Kalaewa'a's'ōa that faces toward Ka'a'awa is believed to be in the pali of Kanehoakani, between Kulao and Ka'a'awa, and the second opening is at the spring Kahu'ula-punawai. This is a burial cave for chiefs, and much wealth was hidden away there with the chiefs of old. On the Kona side of the island the cave had three openings, one at Halikulamanu—near the lower side of the cave of Koleana in Moanalua—another in Kalili, and another in Pu'iwai. There was an opening at Waipahu, in Ewa, and another at Kahuku in Ko'ohului. The mountain peak of Konahuanui was the highest point of the ridgepole of this burial cave "house," which sloped down toward Kahuku.

Many stories tell of people going into it with kukui-nut torches in Kona and coming out at Kahuku. Within this cave are pools of water, streams, creeks, and decorations by the hand of man (hana kinohinohi'a), and in some places there is level land (Kamakau, 1964:38).

The leina a ka 'uahan on Oahu was close to the cape of Ka'eana, on its right (or north, 'akau) side, as it turns toward Waialua, and near the cutoff (alaniu)oki that goes down to Keauku'uku. The boundaries of this leina a ka 'uahan, it is said, were Kahi 'ohana-Wakea, a little below Kakehie, and the lowing place (kawa-kai) of Kilauea at Keawa'ula. At these places would be found helpful 'amakua souls who might bring back the spirit and restore life to the body, or if not, might welcome it to the realm of the 'amakua. Places within the boundaries mentioned were where souls went to death in the po pau 'ole, endless night.

Leilono at Moanalua, Oahu, was close to the rock Kapukakai and easterly of it (a ma ka na'e akau), directly in line with the burial mound of Alamanu and facing toward the right side of the North Star (a huli i ka 'ao'ao 'akau o ka Hokupa'a). On the bank above the old trail there was a flat bed of pahoehoe lava, and on it there was a circular place about two feet in circumference. This was the entrance to go down; this was the topmost hill (mu'u) of Kapapaialaka, a

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place in the 'aumakua realm. Here at the entrance, ka puka o Leilono, was a breadfruit tree of Leiwalo, he 'ulu o Leiwalo. It had two branches, one on the east side and one on the west.

These branches were deceiving. From one of them, the soul leaped into the po pau 'ole; if he climbed the other, it would bring aid from helpful 'aumakua ('aumakua kokua). From that branch the soul would see the 'aumakua realm and the ancestors spoken of. Wakea and all the rest, and those of the entire world who had traveled on this same journey.

The boundaries of Leilono were, Kapapakolea on the east, [with] a huge caterpillar (pe‘eluia nui) called Koleana as its eastern watchman, and the pool Napeha on the west, with a moʻo the watchman there. If the soul was afraid of these watchmen and retreated, it was urged on by the 'aumakua spirits, then it would go forward again and be guided to the 'aumakua realm. If a soul coming from the Alia (Alua‘a‘a) side was afraid of the caterpillar, whose head peered over the hill Kapapakolea, and who blocked the way, it would wander about close to the stream by the harness shop. This was not the government road (alauialaulu) of former times, but was a trail customarily used by “those of Kauhulā‘e” [figuratively, the common people; the ike‘e, old taro leaves, as contrasted with the iko, the new and choicer leaves—that is, the chiefs]. It was said that if a [page 418] wandering soul entered within these boundaries it would die by leaping into the po pau ‘ole; but if they were found by helpful 'aumakua souls, some wandering souls were saved. Those who had no such help perished in the po pau ‘ole of Mū.

On the plain of Kapea beside Pu‘ula, wandering souls could go to catch moths (pulelehua) and spiders (nanana). However, wandering souls would not go far in the places mentioned earlier because they would be found catching spiders by 'aumakua souls, and be helped to escape. Those souls who had no such help were indeed friendless [he po‘e ‘uhae hau‘oku‘oko laukoa] and there were many who were called by this name, po‘e ‘uhae hau‘oku‘e.

There were Leina-a-ka‘u uhanhe and ‘Ulu-o-Leiwalo on Hawai‘i, Maui, Molokai, Lanai, Kauai, and Niihau as well as on Oahu. The traditions about these places were the same. They were where spirits were divided (mahele ana) to go into the realm of wandering spirits, the ao kuuea or ao ‘aumakua; or to the ancestral spirit realm, the ao ‘aumakua; or to the realm of endless night, the po pau ‘ole.

The places said to be for wandering spirits were: Kama‘o‘ama‘o for Maui; Uhana [Mahana] at Kahokumui for Lanai; Ma‘ohela‘a for Molokai; Mana for Kauai; Halalii for Niihau; in addition to Kapea for Oahu. In these places the friendless souls (‘uhae makamakua ‘ole) wandered (Kamakau, 1964:48–49; M.K. Puukī translator).

4.1.6 Alahula Pu‘uloa, he Alahele na Ka‘ahupāhau (The Swimming Trails of Pu‘uloa [Pearl Harbor] are the Trails Traveled by Ka‘ahupāhau)

In 1876, Kamakau wrote about several practices and beliefs pertaining to manō (sharks) in ancient life. One practice of note in the Pu‘uloa region was the practice of transforming deceased family members into manō as ‘aumakua (family gods/guardian). These family ‘aumakua would help its relatives when in danger on the sea—if a canoe capsize or a man-eating shark was threatening attack. Hawaiians also worked with and tamed sharks so that one could ride them like a horse, steering them to where one wished to go (Kamakau, 1976; Puukī, translator). Kupuna Mary Kawena Puukī shared that there were two basic classes of sharks—manō kānaka (sharks with human affiliations) and manō ā (wild sharks of the sea; man-eaters). The manō kānaka were revered and cared for, while the manō ā were at times hunted and killed following ceremonial observances (1976, M.K. Puukī, pers. comm.). The practice of chiefs hunting sharks using the flesh defeated enemies or sacrificial victims as kūpulu manō (shark fishing chum), and of commoners using rotten fish as kūpulu manō are further described in several historical narratives.

Ke Awa‘ula o Pu‘uko‘a are famed in traditional and historical accounts of manō. The traditions center around the several deified sharks, foremost of whom is the goddess, Ka‘ahupāhau, then followed several others, including but not limited to Kahi‘ulu, Kīhaimona, Komowa, Kō/huikimanamumoku‘uka, Kēlīkāu-o-Kā‘ū (Kōlīkīaumoku‘u) and Mikololou. With the exception of Mikololou, all these shark gods were friendly to people and dedicated to keeping manō ā out of the Pu‘uloa-Ewa waters and protecting people.

Traditions of Ke Awa‘ula o Pu‘uko‘a tell us that one of the most important kānāwai (laws) governing manō was that they would not attack humans. This kānāwai was created by the shark gods themselves. Kamakau (1876) wrote about the establishment of this kānāwai stating that:

Oahu was made a kapu land by this kanawai placed by [the shark gods] Kanelumamoku and Komohalla‘i. But their sister Ka‘ahupahau broke the law and devoured the chiefess Papio. She was taken and “tried” (ho‘okolokolo) at Uluka‘a [the realm of these gods], but she escaped the punishment of death. It was her woman kahu who paid the penalty of the law because it was her fault—she reviled Papio. The trouble arose over a papahi lei of ‘Ilima flowers which belonged to Ka‘ahupahau that her kahu was wearing. [The kahu refused to give it to Papio, and] Papio said, “I am going bathing, but when I come back you shall be burned with fire.” But Ka‘ahupahau devoured Papio before she could carry out her threat, and she was punished for this. That is how Pu‘uloa became a [safe] thoroughfare (alahula). After her confinement ended several years later, Ka‘ahupahau was very weak. She went on a sightseeing trip, got into trouble, and was almost killed. But she received great help from Kupiapiapa and Laukahi‘u, sons of Kīhaimona, and when their enemies were all slain, the kanawai was firmly established. This law—that no shark must bite or attempt to eat a person in Oahu waters—is well-known from Pu‘uko‘a to the Ewa.

Anyone who doubts my words must be a malihine there. Only in recent times
have sharks been known to bite people in Oahu waters or to have devoured
them; it was not so in old times (Kamakau, 1964:73; Pukui, translator).

Several place names commemorate the shark gods of Pu‘uola. Among them are three
recorded in the Saturday Press of December 29, 1883 (page 6):

Ke’alii’i A cave in the sea at the entrance to Pu‘uola harbor, and known
by the natives to have been formerly the home of a large shark
called Komoawa, who has been generally credited as the
watchman on guard at the entrance of Ka‘ahupāhau’s waters.
The latter’s royal cave-dwelling was in the Honolulu lagoon.

Kuhia loko Waiawa. Named for one of the attendants/purveyors of the
shark goddess, Ka‘ahupāhau.

Kuhia waho Waiawa. Named for one of the attendants/purveyors of the
shark goddess, Ka‘ahupāhau.

Nahu-Papio or Ka-nahuna-Papio (the biting or shredding of Papio) (Ka Loea Kalaiaina, 1899-
1900), is found along the shore of the Waipio Peninsula, south east of Hōnaikai‘a or Walker
Bay (Register Map No. 322, 1873, J. Lidgate) (Figure 8). This place name identifies the
location where Ka‘ahupāhau killed Papio.

The role of Ka‘ahupāhau as a goddess and guardian in the waters of the Pu‘uola bays remains
alive in the minds of natives in the ‘Ewa District. Her brother Kahūkū (the smiling tailor) is
also remembered, and it is said that with his great tail, Kahūkū was responsible for
destroying any foreign sharks “that offended his sister” Ka‘ahupāhau (Pukui, 1943:57-58).
His cave is reported in several locations, including Drydock No. 1, between Moku‘ume‘ume
and Keanapua‘a, and another in the Waiawa Estuary (Manu, 1894-1895). The cave destroyed
in the construction of Drydock No. 1 was once his home.

Another locational reference to a cave, and the home of Ka‘ahupāhau, is found in the
cartographic records of the Kingdom, cited on Register Map No. 322 (see Figure 8). On the
map, the cave is identified as “Shark’s Den,” along the Honolulu shoreline of the West Loch,
a short distance inland from the old boundary wall between the ‘ili of Pu‘uola, and the larger
ahu‘a‘a of Honolulu. These storied places are a part of the fabric of Hawaiian history and
breathe life into the traditions of old.

In addition to the traditions of Ka‘ahupāhau, two other accounts center around the nature of
sharks in the ‘Ewa District and battles that were fought to kill offending sharks. In the early
1820s, members of the Protestant mission station traveled to the ‘Ewa District and learned
something about the shark gods of Pu‘uola.

Hiram Bingham accompanied King Kamehameha II (Liholiho), the royal family and
attendants to ‘Ewa in 1823, where they stayed near the shore of Pu‘uola. During the visit,
the King and party, along with Bingham visited the dwelling place of a noted shark god. The name

Figure 8. Map of West Loch and Peninsula of Pearl River with Noted Place Names
Cited (1873, J. Lidgate, surveyor, Register Map No. 322)
of the god was not recorded in Bingham’s journal, though one must infer that it was either the goddess Ka‘ahupahau or her brother, Kahi‘uka. Bingham wrote:

I one day accompanied the King [Liholiho] and others by boat to see the reputed habitation of a Hawaiian deity, on the bank of the lagoon of Ewa. It was a cavern or fissure in a rock, chiefly under water, where, as some then affirmed, a god, once in human form, taking the form of a shark, had his subterranean abode. Sharks were regarded by the Hawaiians as gods capable of being influenced by prayers and sacrifices, either to kill those who hate and despise them or to spare those who respect and worship them. It had been held that, when a mother gave her offspring to a shark, the spirit of the child dwelt in it, and the shark becoming an akua, would afterwards recognize and befriend the mother on meeting her, though ready to devour others... (Bingham, 1969:177)

Later in January 1825, Elisha Loomis also traveled to Ewa and stayed along the Pu‘u‘uloa shore (Loomis Journals, Jan. 18, 1823, in Westervelt, 1937). During his visit, Loomis learned the name of the shark goddess who protected the waters of the Pearl Harbor region, also reported hearing about a war between the good sharks and those who sought to eat human flesh. It will be noted that due to his limited Hawaiian language skills, Loomis apparently transposed she for "he" in his journal:

After supper I conversed with them a long time on the subject of religion... during the conversation one of them mentioned that in former times there dwelt at Pu‘u‘uloa a famous shark named Ahupahau. He had a house in the hole of a rock. He was once a god. On one occasion a strong shark 3 or 4 fathoms long came into the channel to make war upon the sharks and upon the natives that dwelt there. Ahupahau immediately communicated to the natives information advising them to get a net out and secure him. They took the hint and spread their nets, and in a little time the stranger was captured (Westervelt, 1937).

Loomis’s reference to a "war" between an invading shark coincides with the traditions of Kaʻōu-i-kanaʻo-o-Pu‘u‘uloa (Uluaa, 1870–1871). Mikololou and Kealii‘auaokuhu (Home Ruia Repubalika, 1902) in which battles between sharks are fought in order to protect the people of the Ewa region from attacks by mano i’a.

J.S. Emerson presented a paper titled “The Lesser Hawaiian Gods” before the Hawaiian Historical Society on April 7, 1892. In this report are details of Ka‘ahupahau, Kahi‘uka and Mikololou in the history of ‘Ewa and the waters of Pu‘u‘uloa:

One reason for the affection shown to the shark aumakua was the fact that so many of them claimed human parentage, and were related by ties of kinship to their kahus. Such was the case with Kaahupahau and her brother Kahi‘uka, the two famous shark-gods of the Ewa Lagoon on this island. Their birth and childhood differed in no essential features from that of other Hawaiian children up to the time when, leaving the home of their parents, they wandered away one day and mysteriously disappeared. After a fruitless search, their parents were informed that they had been transformed into sharks. As such, they became special objects of worship for the people of the districts of Ewa and Waianae, with whom they maintained pleasant relations, and were henceforth regarded as their friends and benefactors.

After a time the man-eating shark, Mikololou, from the coast of the island of Maui, paid them a visit and enjoyed their hospitality until he reproached them for not providing him with his favorite human flesh. This they indignantly refused to give, whereupon, in spite of their protest, he made a raid [page 10] on his own account upon the natives, and secured one or more of their number to satisfy his appetite. Kaahupahau and her brother promptly gave warning to their friends on shore of the character of this monster that had invaded their waters. To ensure his destruction they invited their unsuspecting guest to a feast made in his honor at their favorite resort up the Waipahu river. Here they fed him sumptuously, and at length stupefied him with the unusual amount of awa which they supplied him.

While he was in this condition, their friends, who had come in great numbers from the surrounding country, were directed to close up the Waipahu river, which empties into the Ewa Lagoon, with their fish nets, brought for the purpose, while the attacked him in the rear. In his attempt to escape to the open sea he broke through one net after another, but was finally entangled and secured. His body was then dragged by the victorious people on shore and burned to ashes, but certain dog got hold of his tongue, and, after eating a portion, dropped the remainder into the river.

The spirit of the man-eater revived again, and, as a tongue, now restored and alive, made his way to the coasts of Maui and Hawaii, pleading with the sharks of those waters for vengeance upon the sharks of the Ewa Lagoon. They meantime secured the aid of Kuahimoana and other notable sharks from the islands of Kaua, Niihau, Kauai, and Oahu. A grand sight it was to the numerous spectators on the shore when these mighty hosts joined in combat and began the great shark-war. It was a contest of gods and heroes whose exploits and deeds of valor have long been the theme of the bard of the Hawaiian Islands...

[In the first great battle the friends and allies of the cruel man-eater were touted by the superior force of their opponents, which the good Kaahupahau and her brother long continued to enjoy the affectionate worship of their grateful people. It is said that she is now dead, while her brother Kahi‘uka still lives in his old cave in the sea, where he was visited from time to time by his faithful kahu, Kimona, now deceased. Sometimes Kimona missed his fish nets, when he was pretty sure to find that Kahi‘uka had carried them to a place of safety, to preserve them from destruction by hostile sharks (Emerson, 1892:10–11).]
4.1.7 He Moolelo Kaao Hawaii no Keliikau o Kau (A Hawaiian Tradition of Keliikau o Kau and the Sharks of Ke Awalau ‘o Pu’uloa)

Keliikau-o-Ka‘u was a shark god who traveled to Pu‘uloa, ‘Ewa from the island of Hawai‘i (Mały, translator). The tradition appears only in the short-run Hawaiian language newspaper Home Rula Repubaliiki and is incomplete. The narratives are also different in relation to the events and their outcome than those found in more widely reported narratives. There is no specific reference to the source of the account and only two articles in the series are available. The narratives offer some details on named localities and events that are of significance in the history of Ke Awalau o Pu‘uloa (Pearl Harbor).

Home Rula Repubaliiki
He Moolelo Kaao Hawaii no Keliikau o Kau

Januari 6, 1902 (pao 7-8)

Ka Mano Ka‘e‘a‘a o Hawai‘i nani i hoonahoa a kaiehu aku i ke Ailiwahine Kaa kupu maluna aku o ke kahua kaua ma ka nuku o Pu‘uloa ma Ewa, Ohau, a nolaia keia olelo ka‘unana: "Mehameha Puulea, ua make o Kaahu pauhau.

O keia mano ali o Kalani ka me mana nani la‘e aia ia Keliikau-o-Kau i kino mano a hoomono ia aku la i kino aku makani unihipili maluna o kona makaühine pono, o na keia Kalani no hawai aku i kekah ki ao lika ia Keliikau-o-Kau o kona wa e hoi a ia kehei paa iluna o ke kauoha, oia hoia na kikehea kia maluna o ke kino mai luna a lalo, a o ka malo pau-kaia ka i ka hope, a mamua ae nai o ka hoi ana hō e noho pono iho iluna o ka haaka kino kiihio makani mai kaha ahe a o keia no ka manawa e ike ia aku ai ke kehe-a-wwai ana mai o ke koko ma ka lae me he mea la u maikou i ka paha, e hilihi ana ma na maka a me na papa‘ima, ame ka hū, a e kake ana keia koko a ili i ka umauma, a he manawa keia a makemake ia no ka inu awa; a nea haualoelelelī naunā no ko pono a me ka hewe no ko hele ana ma na lae kahakai, a me ka holo ana ma na wai a ka hawaia. Ua like no ko ane o keia me Haaka-wawahilani ke ho ni mai a noho hō iluna o ke kahau. Ma keia ano, a lilo keia mano unihipili i mea nii a puneheia ia Kalani mai kona kii ana e i kino mano a hiki wale no i kona nui ana ianeane aku he ekolu mea anana ka loa a oii aku i ka hawi.

Ma keia wahi o ko kakou nanea e waiho kakou i ke kamalii ana no ka mea no kaia nanea, a e oeleo ae ho kakou no kekahai mano hookalakapua i hele mai mai Hawai‘i mai a make malo ko o nuku o ke awa o Pu‘uloa ma Ewa ae nei; nolalai, e ohoulu ae e hoohoeno iho kaua e ke hoa i keia mau laalani mele

malalo iho nei, a e loa no ka inoa o u mana la, oia hoi o—
A ka Hipa ika Hipa
I na u o Lewa
Lele ana o Kukamaikakea
Keke na nihō o Lantwahine
Opi ke atalo ke a-huna
Hoi aku au a Lihue
Nana aku ia kai o Ewa
E au ana Mikolololou
A paa ka Nahu‘u o Papio
Paa ke au mimih Leinaka
Paa ka manao hopu i ka lima

O Mikolololou ka inoa o u mano la i hele mai ai a make me Pu‘uloa, nolalai e pono e kamalii ae kakou nona, i maopopo ai ke kumu o ka hiki ana mai o Keliikau-o-Kau.

Na hoakaka no ka Mano Mikolololou, nui oleloia ma keia moolelo na Papai ame Paukapahui i Puna, Hawai‘i, keia Mano o Mikolololou, a o ka mano ali o nuna ka lae o Leleiwi a hiki i kei ka o Makaoalu e pilii ma ke kahi mo kupuni hoopopa o Pokusa ka inoa, o oia no ka mano ali o Kanealeiahi, a ua oleloia he kupa loa kono mau makalae ma kona ka makai o Keaukaha ma Waikae‘a-kai, ma Hilo Bay, Hawai‘i, aole loa hookahi kino kanaka maoli i nauhua e ka mano ma keia wahi, mai ka ma wha kahi ko loa mai ahiki wale no i keia au hou. Aole loa e hiki i kekahi mano kama‘ina a malihini paha ke nauh i ke kanaka, no ka mea hoa mana nii ko Kanealeiahi, oiai, he eula ona mahiele. He mea kei aku i o Makaoalu i hiki i ka lae o Makahana‘ako a holo loa aku i Hiloalipiku, hoi aku ke nauh a ka mano. A mamuli o ko Kanealeiahi manaoh aloha, u a like oia ia ka maolono ane a e keia wahi mano uku ma kumpalai iloko o ka hua e ke ka, a ma kona nana pono ane a aku, u ake akula oia he wahi mano kanaka unihipili — maopopo ko ke aku ia no iaia he wahi mano unihipili he “Aka‘ahu” a he mea ino keia ano he “unihipili hemo ola” e he wahi olelo ia i lai keia maia ia ano o unihipili ma na ike a ka poe Kahuna laapa‘a.

Aia no ia wa, ua la‘e ae la ka mano ali ania Kanealeiahi i Mikolololou i wahi mano lawela‘ewa malalo ona me he keiki hookama la paha ke ano, a ua noho o Mikolololou malalo o ia ano a hiki i kona nui ano, a e hoohole ano hoi i na oelelo apau a ke ali, aole nai oia i ae ia e maio aku ma ke kaipu o ke ali ma kahi i oelelo ma ua ia nei.

Ua oelelo ia no hoi ma keia moolelo, ua haawi aku o Kanealeiahi i kona kei ma na makalae mai Leleiwi aku i hiki i Keauhou e pilii pu la ma He Hopeo ma Puna, a o na aina malo ko keia kihi kei kei keia kihi oia hoi o Papai a me Paukapahui, Pupuaa, Haema, Paki, Aalamanu a hiki i Keouhou. Aia ma keia mau ajina a uai wale na kahu o na mano Mikolololou nei e ho iho ai a noho iluna o na kane a me
Summary — A Hawaiian Tradition of Kel'i'ikau-o-Ka'ū

Kel'i'ikau-o-Ka'ū was born to his mother as the result of her relationship with the spirit form of Kalani, a king of the sharks. He was a favorite of Kalani, and transformed into a shark, whose body was almost three fathoms long.

At this point in our story, we now look to another mysterious formed shark, and his death at the entrance of Pu'uloa at 'Ewa. His name was Mikololou, it was him who was killed at Pu'uloa, and this is why Kel'i'ikau-o-Ka'ū went there. The background of this shark, Mikololou is given in the traditions Kāne'aleihe, and Pāpā'i and Paukūpau of Puna, Hawai'i. Kāne'aleihe protected the lands from Lekeiwī and Mākaokū, near the low islet of Mokuola, and all the way to Makahanaloa of Hilo Palikū. Under the law of Kāne'aleihe, it was forbidden to kill any human. Kāne'aleihe saw swimming past the cliffs, and discerned Mikololou's nature as a spirit-transformed shark, he also recognized that Mikololou was a man-eater.

Kāne'aleihe decided to take Mikololou as an attendant, perhaps even as a foster-son, and to teach him how to live under the law of not killing humans...
4.1.8 He Moolelo Hawaii – No na Aumakua Moo (Hawaiian History – About the Moo Guardians/Ancestral Gods)

In this excerpt from “A History of Hawaii” (Maly, translator), readers learn of the mo’o (water spirit) goddess, Käneku’a’ana. It was to her that the hei‘au wai‘awa (heiau specifically for mo’o spirits) were established along the Pu‘ula‘oa loch to ensure the abundance of various fisheries, particularly the pipi, nahawe, mahame’e, and other bivalve for which the fisheries of Hālawa and other lands of Ke Awaalau o Pu‘ula‘oa were famed. Among the kapu (restrictions) of Käneku’a’ana was that fisher-people needed to be very quiet when going to sea to gather the pipi (pearl oysters) and bivalves. The slightest voice would cause the wind to blow, thus making the pipi and other bivalves sink deep into the sands where they would be lost. It is because of this kapu associated with Käneku’a’ana that the famous saying of “Ewa, ‘Ka i-a hama‘u keo o Ewa” [the fish which quiet the voices of ‘Ewa] came into being. The author also shares the name of Laukupa, as the mo‘o guardian of the waters of Moanaula.

Ka Nupepa Kuokoa
He Moolelo Hawaii (Mokuna VII).

Mei 20, 1893 (aoao 1)

...Käneku’aana ko ‘Ewa moo kiai, hïlïnai nui ko ‘Ewa poe kamaaina iaia, mai Hālawa a Honouliuli. Ina e pilikia ka ia, hoou like na kanaka i na waihalu e pilu ana iaia, a o ka hoa a no ia o ko ahie hoaia i ka pomaikai o ka aiiona. O ka Pipi ka ia kaulana o Ewa. Aole e hale ka mahina e no e ku ai ka la la hua ua pïa ka aina i ka Pipi, mai Nāmakahalaw a na pali o Honouliuli, mai na kua-pao o ua a na pa akule (Pākule); mai ka hologonu a ka papa nahawe kula; mai kaliawa a ka pohaku ona loko a pela aku.

Aia maloko o ka io o ka Pipi momi nani, e like ka nuni me ka onohi ia; he onohiho keokeo kekahii, ua kapaaia he muhe kea; onohiho ulaula kekahii me anuenue ia, he muhe maloko ia. He lilii a nunui

May 20, 1893 (page 1)

...Käneku’aana is the mo‘o (water spirit) guardian of Ewa; many of the natives of Ewa, from Hālawa to Honouliuli followed (believed in) her. If there was trouble with the fishing, the people dedicated her temple (Waihau) with the lighting of a fire to bring about blessings upon the land. The pipi is the famous feh of ‘Ewa. Before six months would pass the hau branches would take hold, and the land would be filled with the pipi, from Nā-maka-o-Hālawa to Honouliuli, from the inland pond walls to the Pā-akule. From the depths to the nahawe reefs and flats. From the channel inlet to the stone-lined ponds, and so forth.

There is within the flesh of the pipi a beautiful pearl, its size is similar to the eyeball of a fish. Some are like the shiny white of an eye, and are called múhe’e kea. Others are shiny red, like are called múhe’e kea. Aia maloko o ka io o ka Pipi momi nani, e like ka nuni me ka onohi ia; he onohiho keokeo kekahii, ua kapaaia he muhe kea; onohiho ulaula kekahii me anuenue ia, he muhe maloko ia. He lilii a nunui

O ka ‘Opaehuna a ‘Opaekala kekahii ia: paapu maloko o ke kai a na loko kua-pa a no loko puuone.

O ka nehu pala kekahii ia: pïa mai ka nuku o Puuola a uka o na Ewa, pela me na nuku awalau a pana; no laia ka ololo ia ana:

"He kai puhi nehu puhi lala
Ke kai o ‘Ewa—e.
E noho i ka lai o ‘Ewainui—
A Laakona—a."

The mahame’e is another famous fish, and the ‘okupe, another, and there are others. And if all these fish are seen there, here are the words of the natives of the land:

"Hoi mai nei ua luahine nei mai na kukulu mai o Kahiki; noho mai la paha a loha i na moomoo ana."

O lakou no kekahii i hai mai i ke ano o na pae aina o Kahiki a me na aina e ae i like o la i... D ‘Hauwhine, he kiai ia no loa o Kawaiini a me Kaelepulu. O Lavukupu ko Moanalua; he malama lakou i ka pomaikai, i pale ana i na pilikia ma ke kina a me ka ohana...

4.1.9 He Moolelo Kaao Hawaii no Laukaiea... (A Hawaiian Tradition of Laukaiea...)

Hawaiian historian Moses (Mose) Manu penned several lengthy traditions for the native newspaper Nupepu Ko Olino, in which he included detailed accounts of a wide range of practices, including those associated with fisheries and deified guardians of the ocean and fresh water fisheries. This account, “He Moolelo Kaao Hawaii no Laukaiea...,” was published
between January 5, 1894 to September 13, 1895. The story is a rich and complex account with island-wide references to places, descriptions of place name origins, descriptions of fisheries and aquatic resources, history and meke, interspersed with accounts from other traditions and references to nineteenth century events.

The following excerpts of the tradition, translated by Maly, include an overview of the moʻolele and those narratives which recount the travels of Makanikeʻoe, one of the main figures in the account. During his travels, Makanikeʻoe sought out caves, and tunnels that served as underground trails, and through the description of his travels, we learn about some of the waiała and resources of Moanalua and lands of the ‘Ewa District through which he traveled. The selected translations also include descriptions of the leaping place of spirits and where those unclaimed spirits wander and identify fisheries—where various species can be found—and the religious-spiritual significance of marine resources.

**Nupepa Ka Oiaio**

**January 5 to 19, 1894**

Kaholokuaawa (w) and Koakea (k) lived at Ulu, in Waipio Valley on the island of Hawaii. They were descended from the chiefly and godly lines of Kahiki and Hawaii. Their first child was Laukaieie. But because she was born in an eepa (mysterious) form, looking more like a plant than a child, she was wrapped in lipoa seaweed and set in the stream. With her parent's knowledge, Laukaieie was retrieved by a mountain goddess and nurtured. Later, another child, a son, was born to Kaholokuaawa and Koakea. They named him Hilaaw, and he lived with his parents.

Koakea's sister was Pokahi, and her husband was Kaukin. Though they had been married for a long time, they were childless, and because of their prayers and offerings, the forest goddess, Hinaaahoana, approached Pokahi while she was gathering seaweed, and told her that she would have a girl child to raise as her own. The condition was, that no one, not even her brother and sister-in-law were to know about this child. Because Pokahi and Kaukin lived on the mountain ridges between Waipio and Waimanu, it was easy for her to keep the secret. It was in this way, that Laukaieie came to be raised by her own aunt and uncle. As a youth, Laukaieie's companions were the spirits of the plants and animals of the forest. When she matured, she was very beautiful, and of thoughts finding an acceptable mate for her began to grow. One night, when Laukaieie was sleeping, she dreamed of flying past the valley lands of Hawaii, and across, Maui, Molokai, Oahu, Kauai, Niihau, Kaula, and on to Lehua３, where she saw a handsome young chief, named Kawelonaakaalalehua. It was this chief that was destined to become her husband...

The following accounts, describing places of the ‘Ewa District and neighboring lands, are

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３The lengthy narratives include site descriptions and traditional accounts for various locations on the island named.

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DRAFT Cultural Impact Assessment Report for the New Aloha Stadium Entertainment District
Hālawa and ‘Aiea Ahupua’a, ‘Ewa District, O‘ahu Island

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excerpted from the longer narratives which describe the travels of Laukaieie, her younger brother Makanike‘oe, and their companions. The lei momi (pearl garlands) of ‘Ewa, were described while Laukaieie and her companions were at Ke‘ana, Moloka‘i:

**March 9, 1894 (page 4)**

Leiomau (a youth of Kaala, Oahu) gave Kaana of Molokai, and Kawelonaakaalalehua, the prized lei momi of ‘Ewa as gifts. The characteristics of these pearls (momi) included those with a fine yellowish tint, others had bumps like diamonds, and some were bluish-yellow. There were many types of pearls, and they were once regularly seen in the sheltered bays of ‘Ewa at Oahu. They came from the Pipi, and the pearls were found near the edges of the Pipi shell. They were greatly cherished by the chiefs of old and worn in lei (necklaces). This is why it is said:

*My fish which quiets the voices,*

*You mustn’t speak, or the wind will blow.*

This is the famous thing of Ewa, where the fish quiet the voices, to these new times. This is the type of lei which had been given to the ali‘i of Lehua, the island which snatches the sun....

**April 19, 1895 (page 1)**

...Laukaieie and her companions, Hinahelelelei and Koahi arrived at Honolulu and were greeted by the natives of that land. Koahi, a chiefess from Makua, Walanae, was related to Kaahoonani (w), Ualena (w), and Kaakioiowao (k), the ali‘i of Honolulu. It is for these ali‘i that the chant is sung:

*Kaahoonani resides upon the plain,*

*Ualena [at Waikolo] is completely surrounded by the Kaakioiowao rain....*

**April 26, 1895 (page 1)**

...Laukaieie and her companions continued their journey through Honolulu and into Wa‘ana. Her younger brother, Makanikeo, followed behind visiting noted places of the land... Having landed on the shores of Mamala, he then traveled to Kahakaaulana and the landing at Koahi. Then he looked down along the glistening sands and waters where the mullet are found, outside of Keahua, at the place called Keawakalai. There he saw a crevasse open in the sea. In this place, were sleeping many sharks and turtles, almost as if under the sand. Makanikeo quickly entered into the cave with the turtles and sharks, to see them more closely. Because of his great speed, they didn't know that he had entered their house. It is true that Makanikeo crawled along one of the
crevasses in the sea, and going beneath the land, he exited out at Aliapaakai, at the place called Manaawaiikieo. That is the entrance of the sea into that great salt water pond of Moamaluia...

Let the author explain here, that this channel was first made when Pele traveled along the islands making craters here and there. This crater is something like the crater of Kauhako, at Kalapaupu, Moloka'i.

By this little explanation my readers, you may also know that the remaining crater is there above Alamanu, the hiding cave of the chief Kahahaha, his companion, Alapai, and his beautiful wife, Kekuapou. He (Kahahaha) is the one who killed the priest Kaopolukupu and his son Kaahulupae, at Waianae. This is how the famous words of the priest came to be spoken:

Strive for the sea my son,
for from the sea shall come (others of) another land.

And this cave has been given the name "Piliu" from the time of the death of the chief Kahahaha.

Piliu, the two of you shall go to Ewa,
You are like a canoe,
Pulled by the rope.
To the cliff of Kealia,
At Kamaomao,
There at Kiniakalehua.

After seeing these places, Makanikee then went to the top of Leilono, one of the deity of ancient times. There is a pit dug there in which the foul smelling bodies of the dead and the defiled matter of the dead are thrown.

Makanikee left that place and went to a place that was covered with something like a rough pahoehoe surface, below the present-day 5-mile marker on the road at Kapukaki. There he saw a woman moving swiftly over a portion of the pahoehoe. Makanikee recognized that this was a spirit form rather than that of a living woman, and he felt compassion for her. He then saw that there was a deep pit there, filled with the spirits of dead people, swaying back and forth, and crying out, with moaning and wailing. This is the pit which in ancient traditions is called Kaleinaakauhane. The spirits of the dead go there and can only be freed if their umakua (ancestral family god) fetches them. They might even be returned back to life again...

Now you may be wondering my readers, what was the name of this woman that Makanikee took up in his hands. Well the writer will tell you the name of this beautiful young woman of Kaiahamakeo o Ewa-nui-a-Laakona (The fish that quiets the voice of Great-Ewa-of-Laakona), it was Kawaiuli. She was a native of two lands of Ewa, Waianu and Waianoko. And it is for this woman that Kawaiuli, between the 9- and 10-mile markers from Waianu and Manaana 2nd is named; it is near the present-day court house of Ewa....

At this place, Kaleinaakauhane, hundreds and thousands of spirits have been lost...

May 3, 1895 (page 1)

...Makanikee then went to the uplands, atop the cliffs and ridges of Koolau, where he looked down and chanted:

Beautiful is Halawa in the Waahilia rains,
Which visits also, the heights of Aiea,
The heat and warmth travels across the plain of Kalaeau.

It is true, that he then went to Kalaeau, where he saw the pool of Kahuawai. He turned to the uplands and saw the source of the water coming out of the earth, near the top of the cliff of Waimalu. The source of this water, from where it flows, cannot be easily seen because it comes out from the ground in an area where there are many deep holes hidden on the side of the cliff of Waimalu. It is from one of these pits that the water flows. It is also at one of these places that the body of David Malo5 was laid to rest.

This place, between Waianu and Waianoko, called Waipuhia, is the place of Kawaiuli, who was brought back to life at Kaleinaakauhane, at Kapukaki....

Kawaiuli invited Makanikee to her home where food was prepared, the aanae (meal) from the pond of Wolokai and the famous foods of the land. Kawaiuli invited Makanikee to stay with her, but he declined, explaining that his elder sister and her companions were waiting for him at Waianae.... Kawaiuli bid farewell to Makanikee and he disappeared from sight, born by the wind, Moae of Ewa.

Makanikee then traveled to Manana, now the 10-mile marked, and the place where the court house of Ewa stands. This is the place where Oulu, the famous warrior of Kahekili, king of Maui, was surrounded by warriors who thought to take him prisoner. It is there that Oulu fought like the eel Palahuwana, and with great strength and skill overcame those who fought against him. The place where this fight occurred is called Kaoiakoaikouli to this day.

Makanikee then followed the trail to a place where he saw a large gathering of youth along the trail, at the place-called Napohakahelu [at Waianu]. The activity of the children at this place was the shooting of arrows, something that

5 This is not David Malo of Lahaina Luna, but a namesake, who was also a historian and active church member.
Cultural History of 'Aiea and Hālawa

May 10, 1895 (page 1)

Kanukuokamanu shot his arrow and it flew beyond all the other arrows of the competitors. It flew all the way to the end of the nose of the pig at Waimano, and then returned to the youth who had shot it...

Makanikee then departed and was lost from sight. Looking seaward, Makanikee saw the fin of a shark passing by, in front of a stone in the estuary of Waiawa, on the west side of Kanukuokamanu, next to Pilaumoa. Seeing the shark, Makanikee drew nearer and he saw that it was Kahiuka, a native of this estuary. His cave was comfortably situated on the side of the stone. Kahiuka was a good shark, and in his story, he is the guardian of Manana and Waiawa.

The author has met a man at Manana who was known by the name, Kahiuka. He learned the traditions of this shark in his youth and was taken by this shark for a period of time and returned again to the land in good health. The man has since died, but his daughter is still alive, and his story is an amazing one.

After seeing the house of this hero of the sea (Kahiuka), Makanikee turned and walked along the place where the waters flow from the land at Pilaumoa, Mokaalina, Paniai, Kapuaialuhu, Kapapau, and Manuua. The trail then turned and went to the top of Haupu, where the foundation of the Luakini (Church) of Ewa was later situated. Near there, was a large pond in which awa (milkfish), anae (mullet), and aholehole (Kuhlia sanvicensis) fish were found.

Oh readers, let the author explain something here. At the time Luau came from Maui to dwell on Oahu, he arrived at Waiawa, Ewa. He saw some men thatching dried ti leaves on the Luakini (church) that was being built there. Luau asked some people, "Who is the one that is having this important house built?" They answered, "Kanepaiki." Luau then stated, "The house shall not be finished to its ridge pole before the one who is having it built dies." The people asked, "Why?" Luau answered, "The house is atop the Heiau (temple) and the Fishpond is below, it is because the waters [life and wealth] are flowing out from this place. (So too shall the life flow out.)" These words of Luau were true, the Luakini of Waiawa was not completed before Kanepaiki died. His body was buried in the uplands of Waimalu.

These were the words of Luau. The one who discerned the nature of the land (kuhikihi puuone), in the time of the King Kauikaauoli K. III. And his descendants are still living at Kanao, Honaulua, Maui...

From this place, Makanikee then turned and looked to the calm waters of Kuhia Loko and Kuhia Waho. He went to the ponds and saw water bubbling out, and in the pond were many fish of the sea. It was of this pond, that Kane and Kanaloa spoke, while in Kahiiki, as heard by the prophet Makuakaumana, who crossed the sea and traveled to Hawaii:

- The mullet are at Kuhia-loko,
- The seaweed is at Kuhia-waho,
- The salt is at Niauele,
- The nehu pala are at Muliwai
- The lone coconut tree stands at Hape,
- The taro leaves are at Mokaalika,
- The water is at Kaaimau,
- The awa is gathered at Kalahikiola.
- Behold the land.

All of these places named by the gods can be seen, extending from the sea of Waiawa, to Halalen texting.
who was of the uplands of Waimano. It is this Kualii who built the long house
called Makamaole, on the inland plains of Manana 2\textsuperscript{nd}. It is near the place now
called Kulakahinahe Momi (Pearl City).

Makanikeoe then traveled to the fishponds of Hanakoa and Eo, the great ponds
of [Waipio' in] Ewa. It is for these ponds that the lines of the song say:

\begin{quote}
The water of Eo is not fetched,  
It is the sea of Hanakoa the ripples forth.
\end{quote}

At this pond, Makanikeoe saw a deep crevasse and inside, there was a giant eel
sleeping. The name Hanakoa was given because of the great amount of work
that was done by the chief and the people in carrying the stones with which to
surround the crevasse and build the pond wall. Thus, the pond was built. And
it is a famous pond for it is rich with fish, and for the eels which Keino hoomanawanui desired to eat.

From the pond, Makanikeoe then walked to a place where there were several
small points of land, near where Papio was bitten and where the sea enters
Honouliuli. He noticed how very calm the surface of the water was here, but
he also saw that it was agitated in its depths. Looking more closely, he saw in
the depths some very large fish, as if guarding the entrance to the harbor. One
of these two large fish was like a marlin with a long bill and rows of teeth. The
other one was a barracuda whose teeth protruded out of both sides of its
mouth. These two fish of the bays of Ewa, had ears with which to hear. They
leapt in the ocean like flying fish and are spoken of in some of the traditions of
Hawaii.

The marlin is the one, who with his sharp bill, divided the waters that enter
into Ewa. Thus, Makanikeoe understood the nature of these fish, and what
their work was. They were the guardians of the place. It is true also, that in a
short while Makanikeoe saw a procession of many sharks arrive. There was in
this group, the famous chiefess, Kaahupahau, of Puuoa, and the messengers of
the king shark [Kamohaili] of Kahoolawe. She was taking them on a tour and
to drink the waters of Waipahu and Wai'ahualae, and to drink the awa from
Kahauone, in Waipio uka…

Makanikeoe then turned again to the place where Papio had been bitten as a
result of her asking for the ʻIlima [Sida fallax] garlands of the old woman,
Koīlaka. This is what the old woman told Papio:

\begin{quote}
The beautiful girl asks,  
That the garlands of the old woman be given to her.  
Heed my words dirt of the dog, dirt of the pig.  
String your own garland and let it wilt.
\end{quote}

Makanikeoe then departed from this place, turning to the plain of Puuokoa. He
passed many pits in this place where the bones of men have been left. He then
followed the trail to the breadfruit tree, Leiwaio, at Honouliuli. This is the
breadfruit tree of the expert sailor, Kahei, so told in his story.

There are also many pits in which were planted sugarcane and bananas, and
planting mounds. He also saw manu oo (honey creepers) sipping the nectar of
noni blossoms. There were also two ducks that had gone into a pit, and with a
great strength, they were trying to push a stone over, to hide the pit. Thus,
Makanikeoe knew what the ducks were trying to do. They wanted to hide a
spring of water which flowed underground there. It is this spring which in
calm times could be heard, but not found by the people who passed through
this area. It was a secret spring, known only to certain native residents of the
area, and its name is recorded in the last line of the song:

\begin{quote}
The ʻu- is the joyful bird of Kaupa,  
The joyful voiced ʻo- is of Puuokoa,  
Softening the blossoms of the williwii,  
Drinking the drops of nectar from the noni,  
The birds drink and pass time,  
The eyes cast about seeking,  
The water of the natives,  
The eyes seek the water of Kaiona.
\end{quote}

This hidden spring, known only to the natives, was not hidden to Makanikeoe.
From there, Makanikeoe then turned back towards Honouliuli and saw the pit
of the native eel, Kapapapuhi, the elder of Launui, whose stone-form body is
there at the base of Kauik, Hana, Maui. He was an eel of ʻOahu who traveled
to Hana where he stayed and was turned into stone.

There is also at this place, Kahiupalai, where the ʻanuʻanu (mullet) begin their
journey from Honouliuli to Kahiuku na at Laiemalo, Koolauka.

Seeing this pit, Makanikeoe swiftly ran back to Waipauh, where he looked at
and peopleless plain. There he saw the source of the water of Kaukauki. It is
near a hidden stone (shaped like a hook pendant) and close to Keuaiolo, along
the trail which ascends straight up to Waipio uka. Makanikeoe then
turned and followed the water path, and with great strength, he arrived at Kawaiapuolu, at Waialua. There, he saw the pool of Laniwahine in the famous pond of Uoka. He then quickly went from Waialua to Kawela, and from there, to Punahouolapa, a deep spring on the plain of Kahuku. There he found the water source that the kapa anvil fell into and was carried to Waipahu, at Ewa. Makanikeoe the crawled along another path and arrived at Panamano, also at Kahuku…

(Makanikeoe continued his journey through the various springs of Oahu, until he rejoined his sister and companions at Waianae. The group then continued on their journey to Kauai…)

4.1.10 He Moolelo Kaao no ka Pahi o Laumeiki (A Tradition of Pahi Laumeiki – A Defied Eel, and how the ‘Aane-holo of Ke Awaalo o Pu’uinoa Came to Travel around O’ahu)

“He Moolelo Kaao Hawaii no ka Pahi o Laumeiki, ka Mea i Like me ka Ili Puapualenalena” (The Hawaiian tradition of Pahi Laumeiki…) was published in the native language newspaper Nupepa Ka Oiaio between November 8, 1895 and February 14, 1896. Like the moʻolelo of Laaka’ie‘ie above, this story was submitted to the paper by Moses Manu (Maly, translator). The moʻolelo primarily focuses on wahi pana and features associated with the lands of Ewa. O’ahu—recounting events associated with the birth and defilement of pahi (eel) guardian of fisheries, and his siblings, among whom was Mokumeha. The full narratives include important descriptions of the fisheries of Ke Awaalo o Pu’uinoa (Pearl Harbor) along with places in Hālawa and extends around the island of O’ahu.

Nupepa Ka Oiaio

November 8, 1895

It is perhaps not unusual for the Hawaiian people to see this type of long fish, an eel, about all the shores and points, and in the rough seas, and shallow reefs and shores of the sea. It is not only one type of eel that are written about, but numerous ones that were named, describing their character and the type of skin which they had. In the ancient times of our ancestors, some of the people of old, worshipped eels as Gods, and restrictions were placed upon certain types of eels. There are many traditions pertaining to eels. It is for this fish that the famous saying “An eel of the sea caverns, whose chin sings.”

Indeed, this is the fish that was desired by Keinohoomanawanui, the eels of the fishpond of Hanaloa, when he was living with his friend, Kalelakaka, above Kahalepoai at Waipio uka, when Kukuihewa was the king of Oahu. It was necessary for us to speak of the stories above, as we now begin our tradition.

It is said in this account of Laumeiki, that his true form was that of an eel. His

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6 An expression that was used to describe a prosperous person (Pukui, 1983; No. 1545).
the same manner, and a great affection was shared between the children born from the loins of one mother.

**November 15, 1895**

Thus, it is told in this tradition, that this is the eel Laumeki. It is he who caused the anae to remain at Honoouliui, and why they are known as "Ka anae o Kaahuualala." (The mullet of Kaahuualala). With the passing of time, the forms of this eel changed. At one time, he was red with spots, like the eel called pahi paka, at other times he was like the lumilo eel.

A while after the birth of Laumeki, another child was born to Kaahui, a son. He was named Mokumeha, and he was given to Wanue, an elder relative of Honoouliui's, to be raised. There are at Honoouliui, Ewa, places named for all of these people. The natives of that land are familiar with these places.

The eel-child Laumeki followed the fish around in the expanse of the sea, and on the waves of this place. This was a work of love and care, done for his parents and family, that they would have no difficulties. In those days, the eel lived in the sea at a place where a stone islet is seen in the bay of Honoouliui, and he would not eat the fish which passed before him. He did these things for his parents and sister Kapapaupuhi.

Laumeki was very watchful of his family, protecting them from sharks, barracudas, and the long-billed marlin of the sea which entered into the sheltered bay of Honoouliui, the land of his birth. Because of his nature, Laumeki did many wondrous things. It was Laumeki who trapped the Puhiala that had lived out in the sea, in the pond of Hanaloa [in Waipi'o]. This Puhiala was the one who bragged about his deeds, and when he was trapped his eyes glowed red like the flames of and earthen oven.

It is perhaps worthy here, my readers, that we leave Laumeki and speak of Mokumeha and his journey around Oahu. At the time when the sun rested atop the head [describing Mokumeha's maturity], and his fine features developed. He was very distinguished looking. At that time, he determined to travel around the island of Oahu. He asked his parents and guardian permission, and it was agreed that he could make the journey.

Mokumeha departed from Honoouliui and traveled to Waianae, and then went on to Laiemalo, at Koolauoa, the place where the youngest sister of his father dwelt. She [Kaihuuakua] was pouding kapa with her brother and thinking about her elder brother. She rose and went to the door of her house and saw a youth walking along the trail. Seeing the youth, her thoughts returned once again to her brother Kaahuualala and his wife Kaohi. The features of this youth in every way, looked like those of his father, and upon seeing him, tears welled up in Kaahuukaunui's eyes. She called to the youth inquiring about his journey, and he responded, answering each of the questions. The moment the youth said the name of his parents, and the land from which he came, Kahuukaua wept and greeted her nephew in the custom of the people of old.

This greatly startled her husband who was out in the cultivated gardens tending to his crops. He thought that perhaps one of his own family members had arrived at the house. When he reached their house, he saw the strange youth and he quickly went to prepare food for their guest. In no time, everything was prepared, and he then went to his wife asking her to stop her crying and invite the visitor to eat of the food that had been prepared. He told his wife, "Then, the talking and crying can resume." She agreed, and they sat down together and ate, and had a pleasant time talking.

Kahuukaua then asked Mokumeha about the nature of his trip, and he explained that he was traveling around Oahu on a sight-seeing trip. Kahuukaua told him, "It is wonderful that we have met you and can host you here." She then asked him to consider staying with her and her husband at Laiemalo, where all of his needs would be met. "We have plenty of food and if you desire a wife, we can arrange that as well." Mokumeha declined the invitation, explaining his desire to continue the journey and then return to Honoouliui...

**November 22, 1895**

Now it is true that at this place, Laiemalo, there was grown great quantities of plant foods, but the one thing that it was lacking was fish. Mokumeha, his aunt, and her husband, Pueo, spoke about this, and it was determined that Pueo should go to Ewa. Mokumeha instructed him to seek out Kaahuualala, Kaohi, Kapapaupuhi, and Laumeki, and to ask for fish. He told them that "Laumeki will be able to lead the fish to you here at Laiemalo."

Pueo departed for Honoouliui [various sites and features are described along the way], and he met with Kaahuualala. Kaahuualala's love for his sister welled up within him, and it was agreed that fish would be given to her and her family. But rather than sending fish home with Pueo in a calabash—fish which would be quickly consumed, causing Pueo to continually need to make the journey between Laiemalo and Honoouliui—Kaahuualala said that he would "give the fish year-round."

**November 22, 1895**

When Kaahuualala finished speaking, Pueo exclaimed, "This is just what your son said you would do!" Kaahuualala and Pueo then went to the house of Kapapaupuhi, who, when she learned that Pueo was her uncle, leapt up and greeted him. They discussed the request for fish and ate while speaking further. Kaahuualala then asked, "Where do you come from?" Pueo answered, "Laiemalo," and he described the land to her.
The next day, Kapapapuhi and Pueo went on a canoe out to the stone islet where Laumeki lived. They took with them food, and as they drew near the stone, the water turned choppy like the water of the stormy winter season. The head of Laumeki rose out of his pit and remained on the surface of the water.

Kapapapuhi offered him the food and food he had brought with him. This eel was cared for just as a chief was cared for. When he had eaten his food and was satisfied, he rested on the surface. Kapapapuhi explained to Pueo that he too would need to care for and feed Laumeki, in order to obtain the fish he needed. Kapapapuhi then called out to Laumeki, "Here is an elder of ours, tomorrow you will go with him and take the fish of our parents with you."

**December 6, 1895**

The next day, Pueo rose while it was still dark, and the stars, Aea, Kapawa and Kauape were still in the heavens. He prepared the foods needed for Laumeki, and prepared the canoes. He and his wife’s family and attendants then went towards Laumeki’s house, where he was resting. When Laumeki saw the canoes coming toward him from Loe o Kahuka, he rose up before them.

Together, they passed Kapakule, the place where the sharks were placed in ancient times as play things of the natives of Puuola. When the canoes and people aboard reached the place where the waves of Kealii break, Laumeki cared for them, to ensure that no harm would befall them. This place is right at the entrance of Puuola.

As the rays of the sun scattered out upon the water’s surface, the people on the canoes saw the red-hues upon the water and upon those who paddled the double-hulled canoes. Pueo then saw something reflecting red, beyond the paddlers, and below the water’s surface. Pueo realized that it was Laumeki with the ana fish. The anae traveled with Laumeki outside of Kumuma, and past Ahua. They continued on past the Harbor of Kalihi at Kahakaulana, with the fish being urged on, by the people back at Kalaekao, Puuola, and Laumeki was at the front, leading the fish at Mamaka... They continued on around Kawaaloa, Makapuu, and traveled passed Koolualuoko, and on past Lanilua at Laemaloo, Koolualoo...

**December 27, 1895**

...This is how the mullet came to regularly travel between the place called Kahiukuuna at Laemaloo and Honouliuli at Ewa...

**January 10 and 17, 1896**

...Mokumeha and Laumeki returned to Honouliuli, and Mokumeha offered a prayer chant to his elder brother:

O eel, O Laumeki,

Who passed before the point,
Dwelling in the pit,
Eel of the cavern,
You of the kauiwa (body) form,
That is the form of the Laumilo,
your wooden body,
it is Laumeki.
Amen, it is freed...

...While Laumeki was resting at Honouliuli, Mokumeha set off once again to visit various locations around the island of Oahu. He bid aloha to his family and walked across the broad plain of Ewa. He arrived at Kapukiki [the boundary between the 'Ewa and Kona Districts at Moanalua], which is the boundary of the land of the streaked seas, that land in the calm, reddened by the dirt carried upon the wind. This is where Ewa ends and Kona begins...

4.1.11 He Moolelo Kaao no Hiiaakaipolipoole... (A Hawaiian Tradition of Hiiaka who is Held in the Bosom of Pele...)**

The epic tradition of the goddess Pele and her youngest sister, Hi'iaka-ka-polii-o-Pele (Hi'iaka), is one of the great traditions of Hawaii. It was often written about in native newspapers between 1860 and 1828. The narratives cited below were published in the Hawaiian newspaper Ka Hoku o Hawaii from September 18, 1924 to July 17, 1928, through the partnership of Julia Keanaona, Steven L. Desha Sr., Isaac Kíhe, and others. They artfully retold this tradition, embellishing it with descriptions of places and events in history, thus, bringing the knowledge of place forward to that later generation. The excerpts below (translated by Malil) offer important details pertaining to wahi pana traditional and customary practices and the naming of places visited by Hi'iaka as she traveled through 'Ewa and on to Moanalua to Kou, which is now known as Honolulu.

**Ka Hoku o Hawaii**

**He Moolelo Kaao no Hiiaakaipolipoole...**

**March 1, 1927**

It is understood that through traditions like this, we are given direction in knowing about the names of various places of the ancient people, and which are no longer known in this time. Hiiaka then continued her journey toward the shore of Puuola, and she thought about the words that she had earlier spoken to Wahineomao and Lohiau, and she chanted:

I will not travel to the shore of Kaupa, To Kaupa where the ohai of Kanehi are found, I will turn away...

...Hiiaka then arrived at a place where many people were gathered together,
March 8, 1927

Learning of the contest that was to be held at Kō, Hīiakā had reservations about having Lōhiānī stop at the court of the chiefess Pēleula. So she chanted, calling to Lōhiānī, telling him to bring the canoe to shore at Pūalā. When Hīiakā chanted, everyone became quiet, because they were awed by the beauty of her chanting voice. One of the women in the group then called to Hīiakā, “You are a stranger to us in appearance, but your chant indicates that you are very familiar with this shore, how is that so?” Hīiakā confirmed that she was indeed a visitor, and yet familiar with the places of this land. She then said, “Ia mākai no kau no e ke kamaāina mākai, ala, i Kou hoi e hui aku ai na maka” (You have asked a good question, kind native, but, it is at Kō, that all the faces [eyes] shall meet).

Thus it is seen that when Hīiakā responded to the woman of Pūalā, that this famous saying of the people of Oahu came about, “Hui aku na maka i Kou” [The faces shall meet at Kō]. Now, Lōhiānī had heard the chant of Hīiakā, and he drew the canoe to the shore. When Hīiakā boarded the canoe, she bid farewell to the people of Pūalā and said, “Hui aku o na maka i Kou” [in other words, we will meet again].

They then directed their canoe seaward, and went out of opening of Pūalā. Hīiakā turned and looked towards the uplands (of Hālawa and Moamalu) where she saw the dwelling places of Kinimakalehua, Leinono, and Keāla [deity of the land]. She called out to them, “So you do not forget me, here is a chant for you” —

Reddish yellow are the rains of Kinimakalehua,
Leinono is the companion above, and Pūalā is shoreward,
The journey across the expansive sands of Ewa has been made arm-in-arm,
I am at Ewa, I greet you o Leinono, We are all companions

In this chant of Hīiakā, she spoke the famous saying that is the pride of the descendants of Ewa, “Ke one kui-ilima maulu o Ewa” (The sands of Ewa, across which everyone joined hand-in-hand). These words of Hīiakā are a famous saying of this land to this day. As the canoe continued toward Kō, the passing of land of Kalihi, Hīiakā looked again towards Leinono and Keāla, and she chanted:

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7 Kīli is a Hawaiian game in which a gourd, a coconut shell, cut in half, are tossed at an opponent’s pok (something like horseshoes). The individual who successfully hits the pok that he or she had selected was the winner and could claim a kiss or some other favor from the opponent (see Maio, 1951:216).
The years following Kīali'i were marked by periods of peace and battles between chiefs who sought control of O'ahu. One of the significant traditions of O'ahu, which was connected to lands of the Pu'u'ōla region, took place in the 1780s. Kahahana, hereditary ruler of O'ahu was tricked by his uncle, Kahekili, King of Maui, into killing his high priest, setting in motion events that led to Kahahana's murder and Kahekili's winning control of O'ahu.

Kahekili had raised Kahahana and he desired to make O'ahu a part of his kingdom. It was the priest Kōpuolupulu who instructed Kahahana against certain actions proposed by Kahekili—who desired the rich fisheries of Pu'ukōa (the Pearl Harbor region) and the sacred land of Kualoa. One of the earliest native accounts pertaining to the death of Kōpuolupulu are in his son Kaulupe'e, and the prophecy uttered at their death, was penned in January 1862 by J.H. Kāne'pu'u, a frequent contributor of island history to native newspapers.

Ka Hoku o ka Pakipika
E kapu ke pahi Rama!

Ianuari 23, 1862 (aooao 2)

...Ua hoolo mau ke Akua i wanana ma o Kaopulupulu ia, kekahhi kaula mana Oahu nei, e hawaii mau ana no i ka aina no na mamo a Sapeta, peni kana ololo i ka aina, nei i ke aho a maake i ke kai, no ke ke kai ho aui mana, aina i, ilo ko aina ia kai. Mai kai mai no o Kahekili maluna ma o ka wai, a pae aia i Oahu nei, kaua ma Kahahana, a holo o Kahahana i ka nahoolele, ilo ko aina ia kai. Mai kai mai no o Kahahana, a holo o Kahahana i ka nahoolele, ilo ko aina i, ilo ko aina i, ilo ko aina ia kai. Mai kai mai no i ka hoole maluna ma nei o ka moku a noho ana i ka nei, he oholo wale no ka lakou i la hana ana mai i nali o kakou, ohe i eha i ka ilo, ilo no ia lakou i la hoopo noapon aupuni, na aina, na kuleana ma ka hoolemaluna, ma ke kau, ma ko hoole i kahi ikele, i ka rama, i ka mea ia mea a, uilo ilo ilo lakou i, o kau no ia o ka hoa aku ma ka palekai.

J.H. Kāne'pu'u
Maunalua, Oahu

Translation

God has fulfilled the prophecy of Kaulupe'e, one of the powerful prophets of O'ahu—giving the land to the descendants of Japheth [cf. Genesis 9:27]—who spoke thus to his son, "Strive to die in the sea, for those of another land shall come from across sea, and the land shall belong to them from across the ocean." Kahekili came from across the sea on a canoe and landed on Oahu. He then engaged in war with Kahahana, who fled to the forests. Thus, the land was taken by the sea. Kahamahé then came from across the sea and engaged in war with Kalanikupule at Nuuanu. Kalanikupule was defeated, and the land was taken by the sea. Then the foreigners came from the across the sea on ships and now reside on the land. Their deeds for our chiefs were kindly, and they took on the work of setting the nations right, the land, the properties easing selling, and creating debt for new clothing, rum, this thing and that, it is all theirs now, and built up on the breakwater... (Maly, translator)

Kamakau (1867) elaborated that about eight years into Kahahana's reign as king of O'ahu, Kahekili succeeded in tricking Kahahana into killing Kaopulupulu. Kahahana called for Kaopulupulu and his son, Kaulupe'e to be brought before him at Wa'i'anae. The call was made from Pu'ukohola (Hill of calling). Upon the summons, Kauopulupu prayed to his gods and discerned that he and his son would be killed once in the presence of the chief. Arriving at the place now called Nakākuli, Kaopulupu called out to Kahahana who looked at him but made as if he did not hear the call (nānā kuli). Kaopulupu then knew for certain that he and his son were to be killed, and he told Kaulupe'e:

"I nei kaha me ike kai! No ke kai ho aua aina!" Strive to lie down in the ocean! For our revenge will come from other lands across the sea (Kamakau, 1867).

Kaulupe'e ran into the water near Pu'ukohola where he was killed. Kaopulupu continued his flight across the Honoululi plain to the shore of Pu'ukohola, where he was then killed (Kamakau, 1867). Kamakau also wrote about the last years of Kahahana's life and his death at the command of his uncle, Kahekili, with reference to events in the neighboring lands of Hō'ā'ae, Wailea and Hāulaulu in Wi'po'ahuapua'a.

For two years and six months Ka-hahana and his wife and Kahahana's friend, Alapa'i, hid in the mountains and were fed and clothed by the commoners, who had compassion upon them. Thus, were the misdeeds of Kahahana justly repaid. They were finally betrayed by Ke-ku-manoha', father of Ka-landa-moku and half-brother of Ke-kua-po'ipō, Ha'aloe being the mother of both. Their last place of hiding was near Wailea at Wailea in 'Ewa. Alapa'i said to Ka-hahana, "Let us kill our wife and then we shall be able to escape." Ka-hahana was more merciful, perhaps because he could not endure to lose Ke-kua-po'i, who was
an incomparable beauty. He said, “Why kill our wife who has been so faithful a companion to us while we have dodged death in cold and wet, wandering here in the mountains, in the thickets of Waiawa, in this ocean of Ka'ie'ia? Perhaps she can persuade her kinmen to help us some day.” Learning that Ke-
kuku-manoaha was at Waikele and Ka-lani-ku-pule and Ka-a-lau-kani at Kapatapahi [on the Waikele-Hō'ā'ae boundary], Ke-kua-po'i made herself known to her brother, hoping that he would save them all three for her sake.

“Where are Ka-hahana and his friend?” asked her brother. “Will you spare us three?” asked the woman. “Why should you die? Are we not all chiefs?” he answered; but his words were false; he intended to give up his brother-in-law to Ka-hekili Alapa‘i urged, “O heavenly one! let us flee. We shall die if we stay here; only Ke-kua-po‘i will be saved.” “If Ke-kua-po‘i is saved, we shall be also.”

“You will not be saved; you are a chief, a ruler by descent.” Then Ke-ku-
manoaha sent men to Ka-hekili at Waikiki to tell him that Ka-hahana was at Waikeli. Ka-hekili ordered him to be killed and brought to Waikiki and he sent double canoes to Halaulani at Waiipi'o in ‘Ewa. Ke-kuku-manoaha killed Ka-
hahana and his friend Alapa‘i, wrapped them in coconut leaves, placed them on the platform of the canoes, and took them to Kahekalii at Waikiki...

Kamakau (1961) wrote that following the murder of Kahahana and Alapa‘i’s chiefs of ‘Ewa and neighboring lands on O‘ahu, plotted against Kahekili. Kamakau’s retelling of the story places events at Waiipi‘o:

After Ka-hahana’s death a plot was laid to murder the chiefs of Maui. Ka-hekili was living at Kailua with most of the chiefs; Mano no, Ka-ua-kepaku-lani, Ka‘i-
amana, Na-makeha, Nahi-olea, Ka-lani-ulu-moku, and others were at Kane‘ohie and He‘eia; Hu‘e‘u alone was at Waialua. Those in the plot were the chiefs Elani, Pupuka, Makai-ulu, Kona-manu, Ka-laiki-o-o-nui, and a great many others. Waiipi‘o in ‘Ewa as the center of the plot got the name of “Waiipi‘o of secret rebellion” (Wai‘pio kimopo). The plotters were divided, Elani and his party to kill the chiefs in ‘Ewa; Makai-ulu, Pupuka, and their accomplices attacked Ka-
helili; Kona-manu and Ka-laiki-o-o-nui and their party to kill Hu‘e‘u; and all to attack on the same night. But someone warned the ‘Ewa chiefs of the plot and they fled to Waikiki, and Ka-hekili and his chiefs escaped in the same way. But Hu‘e‘u, who was living at Kawaiakawa, Kawaihoa, in Waiula, was killed on one of the Kala nights while his guards were asleep. To throw suspicion on others the plotters said, “Death comes from Kauai,” and later they said, “Death comes from Waiipi‘o.” But the plot came out, and when Ka-hekili learned that Elani of ‘Ewa was one of the plotters, the districts of Kona and ‘Ewa were attacked, and men, women, and children were massacred, until the streams of Makaho and Niuhelawai in Kona and of Kahoa‘alai in ‘Ewa were choked with the bodies of the dead, and their waters became bitter to the taste, as eyewitnesses say, from the brains that turned the water bitter. All the Oahu chiefs were killed and the chiefs were tortured (Kamakau, 1961:136).

The words and memory of the prophecy of Ka‘ōpūlupulu remained fresh in the minds of elder kama‘āina through time and were often written down. As noted above in the account of Kāne‘u‘u (1862), many considered that the priest’s words were fulfilled a short time later, with the arrival of Kahekili and his forces on the shores of O‘ahu. This was followed by the arrival foreigners, Hawaiians’ loss of their land and kingdom, and military control over a larger area of the ‘Ewa moku.

In 1900, the native leadership of the Independent Hawaiian party conducted a tour of O‘ahu to advocate for restoration of Queen Lili‘uokalani to the throne. While in Wai'anae, David Kalauokalani, president of Hui Ka‘ala‘aina, spoke to district residents, recalling the power of the prophecy. His talk was described in The Pacific Commercial Advertiser (1900b:5). While some facts differ from the earlier account, the connection between events is significant:

Kalauokalani waxes reminiscent in his speech in Wai‘anae and referred to an incident of the early days of Oahu which he said was applicable to the present situation of affairs as far as the natives were concerned with relation to their political status. He referred to the time when Kahanana was chief of the island of Oahu. There was then living in Wai‘anae a famous kahuna named Kaopūlupulu whose son Kahulupue had committed a crime for which he fled the district. When he was being closely pursued the old kahuna called after his son, saying: “My child, bear up until you reach the water, for when you touch the water, then the land shall belong to those who come over the sea.”

The speaker said this prophecy had been fulfilled and had culminated in the overthrow of the monarchy. He appealed to the people to rectify the evil which the old kahuna had brought upon them (The Pacific Commercial Advertiser, 1900b:5).

Similar recollections on the meaning and fulfillment of Ka‘ōpūlupulu’s prophecy were shared with Kepā Māly by Samuel Hoapili Lono (1973, pers. comm.) and Sister Therma Genevieve (Dowsett) Parish (1997, pers. comm.). Later in this section of the study, an article series penned in 1899 adds further descriptions of hō‘alona (omens) at notable places in Ke‘awaloh o Pau‘ukoa which foretold were believed to have foretold the overthrow of the monarchy.

Native historian Moke Manu wrote further on these events in 1907. Following his defeat at the hands of Kahekili in ca. 1783, Kahanana went into hiding in the ‘Ewa District. In 1785, while Kahanana was at Honolulu, Kahekili sent his warriors to kill him and they landed their canoes at Kāpāhu at the estuary of Hanapouli at Waiipi‘o. The warriors killed the O‘ahu chief on the plain of Hō‘ā‘ae and brought his body back to Halaulani at Waiipi‘o. From there the body was taken to be offered on a temple in Waikiki (Thrum, 1907:213-214).

Other articles in the 1867 series by Kamakau (1961) wrote about notable battles between Kalani‘ukupule (son of Kahekili) and Kā‘eokulani (brother of Kahekili) as the engaged in the settlement of the kingdom left behind by the mō‘ī (king) Kahekili. Kalani‘ukupule held control over O‘ahu and Kā‘eokulani had control over Kauai. The two met on O‘ahu with their forces
and battles occurred at various locations. The ahupua'a of Waipio, Kalauao, 'Aiea and Hālawa are central in these battles. The battle was engaged at Kūkūkū and extended from the uplands of Kuamo'o (between Kalauao and 'Aiea) to the shore of Kalauao at Pa'aiau. Kalaukūpue's forces were aided by foreign fire power. At Kūkūkū, Kaeaokulani was routed and killed by gun fire while fleeing to the uplands. Kamakau (1961) observed that after initial battles on O'ahu, the two chiefs met and entered into a tenuous peace. Then—

...Ka-'ee-kulani set out to return to Kauai by way of Waialua and thence to Waima'a, where he discovered a conspiracy among Ka-'awa and some other chiefs and captains of his fleet to throw him overboard in mid-ocean. Thinking that death on the field of battle among many companions was better than to die alone, he had the canoes dismantled and proceeded to make war on Kālani-ku-pule, joined as he was by the warriors of Waialua and Wa'aanea. Ka'eo's change of plan came to the ears of Kālani-ku-pule, and by November, 1794, both sides were ready to fight, and Ka'eo won an easy victory over Kālani-ku-pule's forces. But during the early days of the war a couple of foreign ships entered the harbor of Koa'au Honolulu, the first to enter that harbor. They were the Jackal and Prince Lee Boo, American [British] ships on an exploring expedition and equipped like [page 168] men-of-war. Kālani-kupule was at once engaged Captain Brown to aid him in this war in return for four hundred [a lau] hogs. A battle was fought on the plains of Pu'unahawele [at Waipio] in which some foreigners were killed by Mare Amara. Natives also killed, and Kālani-kupule was forced to retreat. Some six days later another battle was fought in which Ka'eo was again victorious. This gain he followed up by approaching further upon 'Ewa, hoping to push on to Waikiki which was at that time the center of government. On December 12, 1794, a great battle was fought on the ground of Kālani-manua between Kalauao and 'Aiea in 'Ewa. The heights of Kuamo'o, Kalauao, and 'Aiea were held by the right wing of Kālani-kupule's forces commanded by a warrior named Ko-a-lau-kani; the shore line of Mālie [was held] by the left wing under the command of Ka-mohomohoe; Kālani-kupule himself with the main army held the middle ground between 'Aiea and the taro patches; Captain Brown's men were in boats guarding the shoreline. Thus surrounded, Ka'eo found his men fighting at close quarters and, cut off by Ko-a-lau-kani between Kalauao and Kuamo'o, he was hemmed in on all sides and compelled to meet the onset, which moved like the ebb and flow of the tide. Shots from guns and cannon, thrusts of the sword and spear fell upon his helpers. Ka'eo with six of his men escaped into a ravine below 'Aiea and might have disappeared there had not the red of his feather cloak been seen from the boats at sea and their shots drawn the attention of those on land. Hemmed in from above, he was killed fighting bravely. His wives were killed along with him, and his chiefs and warriors. This war, called Kūkūkū, was fought from November 16 to December 12, 1794, at Kalauao in 'Ewa. At the death of Ka'eo-ku-lani who was the son of Ke-kau-like and his wife Holau, his son George Ka-umu-ali'i became ruling chief of Kauai; but, being too young to take charge of the government, his kahu administered it for him with power to make war.

On the afternoon [of the final day of victory for Ka-lani-k'upule] the dead were gathered together, carried to Pa'aiau, and piled in a great heap. Among the bodies was that of Ka-hulu-mui-ka'amoku, a daughter of Ku'ōhi, the leading kahuna of Kauai, who had fallen with Ka-'eo and the rest at Kūkūkū. Her body had been picked up for dead, carried with the others to Pa'aiau, and left in the heap of corpses. It was about one o'clock in the afternoon when she fell. At about ten o'clock that night she was aroused by an owl that flew over her and beat its wings on her head. She opened her eyes as from a deep sleep and found herself lying with the dead in a great heap. A guard was walking and stood. The owl flew seaward and she followed, crawling, [page 169] until she reached the sea. Then she swam to the opposite shore in spite of her many wounds and landed at 'Aiea, where the owl led her up Hālawa valley into the mountains. There she found a cave and fell as if dead. While she lay unconscious, the owl flew to a former kauh of hers who knew the country well around Hālawa, and this person brought her food and anointed her wounds. Two days later Ka-lani-k'upule proclaimed an amnesty giving life to the captives, on pain of death if anyone, commoner or chief kept up the slaughter. Ka-hulu died in 1834. I have seen with my own eyes the scars of the wounds with which her body was covered. Thus, God showed mercy to this woman until she heard the word of God and the Holy Trinity... (Kamakau, 1961:168-170; MK. Pukui, translator)

4.1.13 Trails and Storied Places of the 'Ewa District (1805-1811)

Later in his series of articles, Ti (1959) described the system of trails that had been used during his youth, also recalling note places associated with the trails. Excerpt from the 'Ewa district include the following history [Figure 9]:

Trails from Honolulu to 'Ewa

...Let us turn to look at the trail going to Ewa from Kikihale, up to Leleo, to Ko'iiu and on to Keoneula. There were no houses there, only a plain. It was there that the boyli and his attendants, coming from Ewa, met with the god Ku'ukai and its attendants who were going to Hoaca. When the kapu moe was proclaimed, they all prostrated themselves on the plain until the god and his attendants passed by.

When the trail reached a certain bridge, it began going along the banks of taro patches, up to the other side of Kapalama, to the plain of Kawaiula; on to the taro patches of Kalih; down to the stream and up to the other side; down into Kahaauiku and up to the other side; turned right to the houses of the Portuguese people; along the plain to Kaua'ula; Kailoa's house of bones; down to a coconut grove and along the taro patches of Koho'ou; up to the other side, and from there to a forded stream and up to Kapakolea, an established resting place for travelers.
The trail began again on the opposite side of the pool and went to the lowland of Hālawa, on to Waimanu, a diving place and a much-liked gathering place. It was said to be the diving place of Pepea, son of Kamehameha I of Maui who was swift in running and leaping. The place from which he dove into the water was 5 to 10 fathoms above the pool.

There the trail led to the taro patches in Aiea and up the plain of Kūkākāu. Just below the trail was the spot where Kaepo, chief of Kauai, was killed by Kalanikupule. From there the trail went along the taro patches to the upper part of Koholokoh and on to Kauhehai, a small waterfall. On the high ground above, a little way on, was a spring, also a favorite gathering place for travelers. From there it continued over a small plain, down the small hill of Waimah, and along the taro patches that lay in the center of the land. Above this trail was the home of one of the two haleo men previously mentioned, the men to whom the boy’s attendants spoke. Paul Marin had a place there also. It could be seen near the edge of a low cliff going down to the upper side of a grove of cactus plants, said to have been first brought to Hawaii by Marin. [page 95]

The trail went down to the stream and up again, then went above the taro patches of Waioka, up to a maile field, to Waimano, to Manana, and to Waiala; then to the stream of Kukahi and up to two other maile fields, Pueoheulele and Haupu. At Pueoheulele was the place where a trail branched off to go to Waiala and down to Honolul and on to Waiaina. As mentioned before, there were three trails to Waianae, one by way of Pau o Kapolei, another by way of Pohakea, and the third by way of Kolekole.

Figure 9. Trails of Leeward O‘ahu (portion of map by Paul Rockwood, based on narrative descriptions penned by John Papa ʻĪn, 1959:96)

From Kunia the trail went to the plain of Keahamoa, on to Maunalua, and along Paupauwela, which met with the trails from Waihau and Waiakaa. The trail continued to the west of Maha, to Mahaumu, and up to Kolekole, from where one can look down to Pokai and Wainanaua. There was a long cliff trail called Elou from Kalena and Haleau to the east side of Kaala coming down to Waiaina. There was also a trail called Kumaipo which went up and then down Makahaua... (ʻĪn, 1959:95–97)

**Entering the ʻEwa District from Waianae uka:**

There the trail met with the one from Kolekole and continued on to the stream of Waikakaalu, Piliama, the plain of Panualu, to a rise, then down to Kipapa and to Kekaualo [Kekauokel]. A trail ran from this main trail to Kalakoa, Oahu, and other places much visited, such as Kukaniko. From there it extended to the digging place of Kahalo, then went below to Paupalai, thence to Lepeula, and to Kakeleipa [Waipio], where the legendary characters Kakelea and Kainohomanawalii lived. Then it reached Kekauole, the stone in which the niho palaoa was hidden, then went on to Puuahalewai and Pueoheulele, where it met with the Waiala trail.

All of these places mentioned had large populations. The land was rich, and there were many trees in old times. Who has “closed” these places today? We do not know enough to say, “It was so-and-so.” But there would be commercial wealth in the trees of these mountains if they were fenced off from animals. So, it is with the planting places so feverly poor person. The person who manages these mountains and valleys could become prosperous (ʻĪn, 1959:99).

4.1.14 Place Name Article Series (1883-1884)

In 1883-1884, the *Saturday Press* ran a series of articles under the heading “Dictionary of Hawaiian Localities,” in which were published a number of place names from around the islands. The introduction to the articles shared:

The names given below are Hawaiian geographical names of towns, districts, ridges, mountains, valleys, bays, rivers, etc., which English readers are likely to encounter in historical or newspaper reading. Translation are given when a satisfactory English rendering is possible. This dictionary will be continued as complete as possible... (*Saturday Press, December 29, 1883*)

It should be noted here that the author was not conversant in Hawaiian language and some of the translations are inconsistent with native thought. Though in some instances the translations offered are acceptable. Names from Kalua, ʻAiea and Hālawa are cited below.

**Saturday Press**

*Dictionary of Hawaiian Localities.*
July 28, 1883 (page 5)
Alamanu – “Salt-lick of the birds.” A fresh water pond in the hills behind Moanalua, Oahu, and makai, or towards the sea, from the government road. Aliapaakai – Salt water pond adjoining the fresh water pond behind the Moanalua hills. This is a very curious natural wonder. In certain years, the whole lake is crusted all over the natural deposit of salt. Natives formerly believed in a connection between such a formation and public disaster...

January 12, 1884 (page 5)
Kaonohi – “Eye-ball.” Land in Kaluauo, Ewa.
Kamoohi – “Small snake, or small strip of land.” Land in Aiea, Ewa.
Kealipii – “Ladder or steps.” Landin Aiea, Ewa.
Kalalalo – “Low or settling sun.” Land in Aiea, Ewa.
Kulina – “Slight acquaintance.” Corn or land in Halawa, Ewa.
Kamau – “Inviting to a meal, or to assist.” Land in Halawa, Ewa.
Kahi – “Belonging to another.” Land in Halawa, Ewa.
Kaloikoli – “Small pond.” Land in Halawa, Ewa.
Kunana – “Stand looking or wondering.” Land in Halawa, Ewa.
Kualimanu – “Selling or purchasing shark.” Land in Halawa, Ewa.

4.1.15 Na Wahi Pana o Ewa i Hoonalowaleia i Keia Wa a Hiki Ole ke Ikeia (Storied Places of Ewa, That are Now Lost and Cannot be Seen)

Between June 3, 1899 to January 13, 1900, the Hawaiian newspaper Ka Loea Kalaiaina published a series of articles titled “Na Wahi Pana o Ewa i Hoonalowaleia i Keia Wa a Hiki Ole ke Ikeia.” The author of the series is not identified, but it is a rich resource of traditions, named places and history of the district. Also notable are references made by the author to the rapid loss of wahi pana, largely a result of the vast acreage being turned over to sugar cane cultivation.

With in the series are found a few references to the ahupua’a which are the focus of this study. The excerpts below focus on several of those narratives. A careful review of the original Hawaiian texts has been made, and the translations summarized by Maly with reference to notes developed by Mary Kavena Pukui.

Ka Loea Kalaiaina
Na Wahi Pana o Ewa i Hoonalowaleia i keia Wa a hiki ole ke Ikeia.

August 19, 1899 (page 3)

Pipiloa: O ka inoa o keia pohaku ka i kapaia i ka lae a au ino loke o ke kai a kokoke e pilii Mokuumeume, keia mokupuni i moku i ke kai no na ipu-haole momona i ino i keia manua aku nei.

Ma keia wahi, he mea pono i ka mea kakau e hai aku i ka moeole o keia wahi mokupuni o Mokuumeume.

He wahi mokupuni hoopomaikai keia i ko Ewa nei poe ma keia mai kumu, 1. O ke kama ipu-haoale; 2. O ka mauu pilii-hale.

O ia i ko Ewa nei poe kukuhi hale, no keia wahi mokupuni waile no ke pilii e ako ia ai i na hale a hiki wale no i ka wa i hoe ma ai ke pilii laau a ka haole, a kahi no a pau ke ako ia ano o ke pilii-Hawaii. O ka hale pilii hope loa i akoia hema nei o ia ia o ka hale o ka Lunakanawai Kiekie, ia hale pau loa ke akoia ana o ke Pilii-Hawaii mai keia wahi mokupuni mai o Mokuumeume.

O keia mokupuni, he panoa a me ka wai o le. I kia wa nae noho ia ano o ka pae kuru i ipu haoale, aia ka wai i Kahuawai, aia i Pukihana, aia i Napaue, aia no hoi i ka wai hui o Kahuaki Waipio; o ia iho la ia wahi o olo‘ia ka wai mai Mokuumeume aku.

O keia wahi no hoi kahi i nohoia e ko poelava'a upena uhananana. Aia ma kekahui hui o keia mokupuni i kekahui ana nui; oia ka hale o ka poe lawaiwa e noho ai. Ka inoa o ia anoa, o Kaenaana; ua kamaaina na mea a pau i keia anoa pahuku. A o ia ia mea kakau i hoomanao ae ai i kekahui himeni i hakuia e na ke[kli] o Waipio a me Wakeke e pilii anoa ia keia anoa, a penei:
August 26, 1899 (page 3)

...E mā ka lae hema-komohana o keia mokupuni ka lae o Kaimaenae, aia ma keia aoao mai o ko kaluluono o Ishawa ka lae o Keanaapua. Ua kapaia keia lae ma ka inoa o kekahi ana nui, he wahī i nohoia ai e ke poe laiwai.

Eia kahi moolelo e pilie ania i keia ana. Ia Kamapuaa i hele mai ai mai Kaliuwaa mai, o ko hele mua loa ana mai keia a Kamapuaa a moe ioko o keia ana; oiai nei oia e noho pu no ia me ko laua kupunawahine i Kaliuai o Kamaulaniho. A penia ka moolelo o kona hele ana mai; ua hele mai nae oia ma ke ano kino papalu, he puaia i kahi wa, a he kanaka i kahi wa...

Ma kona ao Puua, ua hele mai oia ma na ao eihiku. 1-Eelele, 2-keokeo, 3-ulaula. 4-ele kalakoa. 5-keokeo-kalakola. 6-ulaula-kalakoa. 7-oolo a. Aole keia o ko pau o kona mau kino, he nui aku, aka nae, o ka nui keia o kona mau kino i kela hele an...

Translation

August 19, 1899 (page 3)

Pipiloa: The name of this stone is also the name of the point which juts out to the sea, close to Mokumeume. That island which is set in the sea for which the sweet watermelons were known before.

At this place it is appropriate for the writes to share the history of this little island, Mokumeume. This island is a blessing for the people of Ewa for these reasons, 1. The planting of watermelon; 2. The lost pilie grass.

At the time that the people of Ewa built [traditional] houses, this little island was the only place where pilie for thatching house was obtained, this until the time of the wooden shingles of the foreigners. Then thatching with the Hawaiian pilie ended. The last house to be thatched with Hawaiian pilie from the island of Mokumeume, was the house of the Chief Justice.

This island is barren and waterless. At the time when the people who planted watermelons lived there, the water was from Kahuawai, Puhihaki, Napuea [at Kalanao], and the cool water of Kahuiali, Waipio. Those are the places where the water for Mokumeume came from.

This is one of the places where the net fishermen resided, setting nets for the mullet. There on one side of the island is a large cave. That is the place where the fishermen resided. The name of the cave is Keaneana; all of the natives are familiar with the stone cave. It makes the writer recall a song composed by the youth of Waipio and Waikiele for this cave, it is:

Love for Kaneana
Place where we slept
With the coarse mat
And the jacket as our pillow...

There on the south western point of this island is the point of Kaimaenae. Across there where the cove is on the Hālawa side is the point of Keanaapua. The point is name for the large cave, a place where the fishermen have resided.

Here is a story about the cave. When Kamapuaa came from Kaliuwaa, his very first journey; this is where Kamapuaa slept in this cave. This was when he lived with his grandmother, Kamaulaniho at Kaliuwaa. And the story of is traveling, he came in is nature with dual forms, sometimer as a pig, other times as a man...

In his nature as a pig, he travels in seven forms, 1-Black, 2-White, 3-red, 4-dark spotted, 5-light spotted, 6-red spotted, 7-brown. These are not all his body forms, there are many more, but these are most of his forms when traveled...

August 26, 1899 (page 3)

0 friends who are reading this story of the famous places of Ewa which hidden and not to be seen again. Don’t grumble with me for my traveling along with the story of Kamapuaa. I was speaking of the point in the past issue which is the point known as Ke-ana-pua (The-cave-of-the Pig)...

On January 13, 1900, the author of "Na Wahi Pana o Ewa..." discussed traditions of Pu’u o Kapolei and Kamapua’a and shared a mele pana (chant of storied places) for places around O‘ahu, including the ahupua’a of interest in this study.

Ka ʻIkea 2004
Na Wahi Pana o Ewa i Hoomalowaleia i Keia Wa a Hiki Ole ke Ikekia

January 13, 1900 (aoao 1)  January 13, 1900 (page 1)

...E nae mai kakou i Puu o Kapolei. O keia pu kekahi o keia pu kekahi...
puu kaulana loa i ka wa kahiko. Mai keia puu mai i haku ia ai kekahi mele i kamaaina i ka poe lealea o ka wa kahiko, ua haku ia apuni Oahu nei, a ma ia mele e oli ai ka poe Pukaula a me ka poe Uikele laau, ka poe kimo pohaku, hua Noni, hua kukui pana.

Ua hele ia ia inoa o keia mele ma kaina o ka aina, a oia ka‘u e panee aku nei imua o ka poe aole i loaa a paa naau i nei mele. E like me na mele kahiko i loaa ole i kekahi poe, a loa hoi kahi i kekahi poe:

This was a chant the was song to recount land names, and I present it before the people, who may not have it memorized. It is like the old chants that are not known by some people, though it is familiar to other people [the chant is presented in a riddle style, stating a question and answering it by speaking the place name]:

E Kawelo e, e Kawelo — e O Kawelo, o Kawelo — e Kawelo with the large genitals, of Puu-­o-­Kapolei, O Puu-­kapolei

O Uliali ka Poi a kaua e ai nei — It is Puu-­kapolei. O Honoolulii

Aeae ono—oa Paaka‘e e hoa-aee Fine and delicious is the salt of Hoa-aee O Hoa-aee

Pikele, Pikele ka i’a e Waikele— It is Waikiele Ka Hale pio ka hua moa— A House arched like an egg — O Waipo

E ku a ai kaua i ka loko awa — Stop and eat of the awa-­fish — O Waiawa

Mai hoomanaa ia kua — Let us not spread out the limbs — O Manana

Kini kahu-­awai he lau he mano — Many streams, hundreds and thousands — It is Waimano Ko ia kaua e ke a — We two are drawn in by the currents — O Waiau

Kukui mahimahal o kaua [kaua] We two are in the shade of the kukui trees — O Waimalu

E ala kaua uao — Let us get up for it is day — O Kalauao

E kipa kaua e ai — Let be hosted to eat — O Akea

times. It is from this hill that chant was composed by the natives, and those who were skillled in the games of olden times. It was composed to go around the Oahu. It was with this chant that the people who played pukaula (a guessing game) and those who played the wooden ukele (a native bow string instrument), and those who juggled stones, noni fruit or kukui nuts.
Section 1. Resolved. That fee simple titles, free of commutation, be and are hereby granted to all native tenants, who occupy and improve any portion of any Government land, for the land they so occupy and improve, and whose claims to said lands shall be recognized as genuine by the Land Commission; provided, however, that the Resolution shall not extend to Konohiki or other persons having the care of Government lands, or to the house lots and other lands, in which the Government have an interest, in the Districts of Honolulu, Lahaina and Hilo.

Section 2. By and with the consent of the King and Chiefs in Privy Council assembled, it is hereby resolved, that fee simple titles free of commutation, be and are hereby granted to all native tenants who occupy and improve any lands other than those mentioned in the preceding Resolution, held by the King or any chief or Konohiki for the land they so occupy and improve. Provided however, this Resolution shall not extend to house lots or other lands situated in the Districts of Honolulu, Lahaina and Hilo.

Section 3. Resolved that the Board of Commissioners to quiet Land titles be, and is hereby empowered to award fee simple titles in accordance with the foregoing Resolutions; to define and separate the portions belonging to individual; and to provide for an equitable exchange of such different portions where it can be done, so that each man’s land may be by itself.

Section 4. Resolved that a certain portion of the Government lands in each Island shall be set apart, and placed in the hands of special agents to be disposed of in lots of from one to fifty acres in fee simple to such natives as may not be otherwise furnished with sufficient lands at a minimum price of fifty cents per acre.

Section 5. In granting to the People, their House lots in fee simple, such as are separate and distinct from their cultivated lands, the amount of land in each of said House lots shall not exceed one quarter of an acre.

Section 6. In granting to the people their cultivated grounds, or Kalo lands, they shall only be entitled to what they have really cultivated, and which lie in the form of cultivated lands; and not such as the people may have cultivated in different spots, with the seeming intention of enlarging their lots; nor shall they be entitled to the waste lands. Generally wet lands, ponds and fallow fields (see citations later in this section).

Section 7. When the Landlords have taken allotial titles to their lands the people on each of their lands shall not be deprived of the right to take firewood, aho cord, thatch, or ti leaf from the land on which they live, for their own private use, should they need them, but they shall not have a right to take such articles to sell for profit. They shall also inform the Landlord or his agent, and proceed with his consent. The people shall also have a right to drinking water, and running water, and the right of way. The springs of water, and running water, and roads shall be free to all should they need them, on all lands granted in fee simple. Provided, that this shall not be applicable to wells and water courses which individuals have made for their own use.

Done and passed at the Council House, Honolulu this 6th day of August 1850. (Copied from original hand written “Enabling Act” – Hawai‘i State Archives, DLNR 2-4.)

At the outset of the Māhele, King Kamehameha III (Kuaukeou) invited prominent ali’i and konohiki, as well as a group of foreigners—individuals who had provided service to Kamehameha I and/or the Kingdom—to lay their personal land claims before a committee. The resulting record is a book known as the *Buke Māhele* (Division Book) of 1848 (copy of 1864). It is a record of the agreements made between the King, Kamehameha III, family members, supporting chiefs, and others who supported Kamehameha I and his heirs in the period between the 1790s to the 1840s. The *Buke Māhele* also lists the lands granted by the King to the Government land inventory—financial returns from sales and leases of such were dedicated to the support of government operations—and for conveyance through Royal Patent Grants to Hawaiians and other parties in leasehold and fee-simple interests. The *Buke Māhele* is also the primary source for identifying the Crown and Government land inventory now known as the “Ceded Lands.”

Table 4 is a compilation of the records filed in the *Buke Māhele* between Kamehameha III, the Chiefs, and selected foreigners, and provides the general disposition of ‘Aiea and Hālawa akupua’a. At the close of the King’s Māhele, ‘āina (ahupua’a and ‘ili) which claimants had relinquished to the King, were again “māhele a’u” (divided) between the King and the Aupuni (Kingdom/Government), with the formal record being entered and signed on March 8, 1848. In this way various parcels of land in the ahupua’a cited below were conveyed to the Aupuni, and from those ‘āina, Palapala Šiia Nui (Royal Patent and Land Grants) were sold to various parties or maintained in the land inventory. Following the overthrow of the Queen Lili‘uokalani as sovereign ruler of the islands, the latter lands which were still held by the kingdom or government became a part of the “Ceded Lands” inventory after annexation in 1898.

### Table 4. Disposition of the Ahupua’a of ‘Aiea and Hālawa as Recorded in the *Buke Māhele*  

<table>
<thead>
<tr>
<th>Ko Kamehameha 3</th>
<th>Ko Kamakee Piikoi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mauna</td>
<td>Illo no</td>
</tr>
<tr>
<td>Aiea</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ko Kamakee Piikoi</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date/Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 28, 1848 (11-12)</td>
</tr>
</tbody>
</table>

*See also Kanawai Hoopai Karaima no ko Hawai‘i Pare Aina (Penal Code) 1850.*
4.2.2 Place Names from the Ahupua’a of ‘Aiea and Hālāwai Cited in Records of the Māhele ‘Āina

As discussed earlier, inoa ‘āina (land or place names) are a significant indicator of cultural attachment and knowledge of place. The names are often descriptive of: (1) the terrain, (2) an event in history, (3) the kind of resources a particular place was noted for, or (4) the kind of land use which occurred in the area so named. Sometimes an earlier resident of a given land area was also commemorated by place names.

The named localities extend from the shore to the mountain slopes. In some instances, the place names identify a specific site on the land, while others describe regions or strips of land. Other parcels of land identified in the records include ‘īli, kula (plains), mo‘o‘āina (land parcels), lo‘i (irrigated terraces) or kīhāpai (small land divisions). These parcels of land were established as smaller subdivisions or management parcels which might include a quarter acre parcel for a single house site or garden plot, or hundreds of acres.

Following below is a compilation of 55 place names from ‘Aiea and Hālāwai as identified in the claims of native tenants in the ahupua’a.

4.2.2.1 Place Names of ‘Aiea from Records of the Māhele ‘Āina (28 Place Names Recorded in 31 Claims)

<table>
<thead>
<tr>
<th>Place Name</th>
<th>ahupua’a</th>
<th>1st Place Name</th>
<th>2nd Place Name</th>
<th>3rd Place Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Aiea</td>
<td>Ahupua</td>
<td>Ewa</td>
<td>Oahu</td>
<td></td>
</tr>
<tr>
<td>Kaumoku</td>
<td>‘Omo ‘o</td>
<td>Kapoho</td>
<td>Uahekolina</td>
<td></td>
</tr>
<tr>
<td>Kapakai</td>
<td>Kealapī</td>
<td>Wahi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kapalakai</td>
<td>Māo Na</td>
<td>Waihikū</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kala‘aua</td>
<td>Pala‘o</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haimeheha</td>
<td>Mariki</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘Aiea</td>
<td>Ahupua</td>
<td>Ewa</td>
<td>Oahu</td>
<td></td>
</tr>
<tr>
<td>Kalapau</td>
<td>Kia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kalolihi</td>
<td>Konohiāhalehu</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaloloko</td>
<td>Kula‘ana</td>
<td>Maui kapua‘a</td>
<td>Maui kapua‘a</td>
<td></td>
</tr>
<tr>
<td>Kamananui</td>
<td>Kula‘ana</td>
<td>Pa`alaha‘a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kama‘u</td>
<td>Kula‘u</td>
<td>Pumoku</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kamo‘okii</td>
<td>Kumu‘u</td>
<td>Pehai‘a‘a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kanameli</td>
<td>Kumu‘u</td>
<td>Pio‘owai</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kawananae</td>
<td>Kunana</td>
<td>Pohakea</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.2.2.2 Place Names of Hālāwai from Records of the Māhele ‘Āina (27 Place Names Recorded in 26 Claims)

Kahua‘ōo  Keau‘upuni | Makalii
Kaliopapa  Kia | Manakapua‘a
Kalolihi  Kono‘hiku‘le‘ale‘alehu | Maui kapua‘a
Kaloloko  Kula‘ana | Muliwai
Kamanunui  Kula‘ana | Pa‘alahama
Kama‘u     Kula‘u | Pumoku
Kamo‘okii  Kumu‘u | Pehai‘a‘a
Kanameli  Kumu‘u | Pio‘owai
Kawananae  Kunana | Pohakea

4.2.3 Summary of Land Use/Residency Practices in the ‘Aiea and Hālāwai

A review of the Māhele records was conducted to capture a glimpse into land use practices at the time of the Māhele ‘Āina. While the historic record provides significant evidence of the kinds of daily subsistence practices and work undertaken by early residents in the project area ahupua’a, it should be remembered that this evidence is still incomplete. For example, it is clear that people traveled regularly between the coastal region, areas of habitation and upland agricultural-resource collection sites. But there are almost no references to the “alā pi‘i uka” (trails on which to ascend to the uplands). Also, while looking for references of traditional ceremonial sites/religious features in the claims, none were found. This is not surprising since Reverend A. Bishop, overseer of the ‘Ewa Mission Station, also oversaw recitation of native claims for kuleana; thus, such references may have been purposely left out of the documentation. Still, the evidence of wahi pana is found in a number of place names which span the ahupua’a of ‘Aiea and Hālāwai. The lists that follow below describe the primary land use and types of features documented through the Māhele Register and Testimony volumes for each ahupua’a in the study area.

‘Aiea Claimsant Provided Testimony of the Following Uses and Features:
- Hale, kahua‘ale, pā hale (houses and house lots)
- Kahawai, ‘auwai and muliwai (river-stream flow, irrigation channels and estuaries) supported agricultural practices
- Kai (fishery resources) harvested
- Kula (dry land parcels) used for diversified agriculture
- Lo‘i kalo (tan pond fields)
- Loko, loko fa‘a, pu‘u‘one (fishponds) made and maintained to supply fish to chiefs and tenants
Cultural History of ‘Aiea and Hālawa

- Pā, pā ‘āina (fences and walk) used to enclose land parcels and determine boundaries
- Pō‘alāma (Friday agricultural parcels) lands dedicated to cultivation of crops for the chiefs/konohiki

Hālawa Claimants Provided Testimony of the Following Uses and Features:
- Hale, kahuhale, pā, and house lots
- Kahawai, auwai, and mulwai (river-stream flow, irrigation channels and estuaries) supported agricultural practices
- Kō‘ele (agricultural fields) dedicated to cultivation crops for the king or chiefs
- Kula (dry land parcels) used for diversified agriculture
- Kulana (pasture lands) for grazing introduced ungulates
- Loko, loko ‘ī‘ī (fishponds) made and maintained to supply fish to chiefs and tenants
- Pā, pā ‘āina (fences and walk) used to enclose land parcels and determine boundaries
- Pō‘alāma (Friday agricultural parcels) lands dedicated to cultivation crops for the chiefs/konohiki

4.2.4 Māhele and Grant Parcels Cited on Historic Maps Near the Project Area

In an effort to identify storied places on the landscape, annotated maps were developed to define possible boundaries of various named locations, sites or features. The base map date from 1873 to 1913 and identify lands awarded as a part of Māhele ‘Āina, or those parcels of land sold as Grantees through the issuance of Royal Patents. Thus, various land parcels, named locations, and geographic features of note can be found. The following lists cite the source maps and the features found within the proximity of the project area.

Register Map No. 323 – ‘Aiea

<table>
<thead>
<tr>
<th>Parcel No.</th>
<th>Claimant</th>
<th>Land Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crown</td>
<td>Aiea Ahupuaa</td>
</tr>
</tbody>
</table>

Register Map No. 1687 – Hālawa and Neighboring Lands

<table>
<thead>
<tr>
<th>Parcel No.</th>
<th>Claimant</th>
<th>Land Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCA 8516 B</td>
<td>Kama‘akeha</td>
<td>Hālawa Ahupuaa (Queen Emma and Bishop Estates) Kekahaupakuakau Kalapua Kapukokekohe Loko Kunana</td>
</tr>
</tbody>
</table>

Register Map No. 1944 – Aiea (Makai)

<table>
<thead>
<tr>
<th>Parcel No.</th>
<th>Claimant</th>
<th>Land Area</th>
</tr>
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<tbody>
<tr>
<td>LCA 2054</td>
<td>Kaapuni</td>
<td>Kalawaha (adj.)</td>
</tr>
<tr>
<td>LCA 2102</td>
<td>Ka’oha</td>
<td>Kalapokapaoa</td>
</tr>
<tr>
<td>LCA 933:5:2</td>
<td>Pūhi</td>
<td>Kealapii, Waihiana (adj.)</td>
</tr>
</tbody>
</table>

4.2.5 ‘Aiea Ahupua‘a – Registered Claims

The following table provides the claims registered from ‘Aiea Ahupua‘a. The bolded entries are further explored in the pages following the table.

<table>
<thead>
<tr>
<th>Book</th>
<th>Vol.</th>
<th>Page</th>
<th>Helu</th>
<th>Alpha</th>
<th>Claimant</th>
<th>Place Name</th>
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<tbody>
<tr>
<td>NR</td>
<td>3</td>
<td>315</td>
<td>1990</td>
<td>Nahe</td>
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<tr>
<td>NT</td>
<td>3</td>
<td>579</td>
<td>1990</td>
<td>Nahe</td>
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</tr>
<tr>
<td>FT</td>
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<td>244</td>
<td>1990</td>
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</tr>
<tr>
<td>MA</td>
<td>6</td>
<td>117</td>
<td>1990</td>
<td>Nahe</td>
<td>Kapoho alua (2)</td>
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</tr>
<tr>
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<td>Maunakea</td>
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<tr>
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<td>3</td>
<td>588</td>
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<td>Maunakea</td>
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<tr>
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<td>Maunakea</td>
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<tr>
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<td>Kapalakai</td>
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</tr>
<tr>
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<td>3</td>
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<td>2052</td>
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<tr>
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<td>2053</td>
<td>Kahooloanohano</td>
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<tr>
<td>NT</td>
<td>3</td>
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9 An overview of the development and issuance of Royal Patents on Grant Lands is cited later in this study.

DRAFT Cultural Impact Assessment Report for the New Aloha Stadium Entertainment District
Hālawa and ʻAiea Ahupua‘a, Ewa District, ʻEwa Island
### Cultural History of 'Aiea and Hālawa

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Helu 1990, to Nahe
Kapoho 2, Aiea
Mahele Award Book 6:117 (Royal Patent Helu 788)

Helu 2052, to Keoanui
Kapalakai, Aiea
Mahele Award Book 6:116 (Royal Patent Helu 790)

Helu 2054, to Kaapuni
Kalawaha, Aiea
Mahele Award Book 6:115 (Royal Patent Helu 784)
Helu 2102, to Kaohe
Kalokopaoa, Aiea
Mahele Award Book 6:115 (Royal Patent Helu 797)

Mooaina of Kalokopaoa. Boundaries: Paaina; Pasko’s house lot; Kahakai; Konohiki’s Loko; Koele; Kalawaha.

Helu 2141 & 9338, to Keapohiwa
Kapakai, Aiea
Mahele Award Book 9:373 (Royal Patent Helu 2875)

Mooaina and Kahuahale at Kapakai. Boundaries: Kalohi’s land; Konohiki’s land; Pua’s land; Konohiki’s land.
Helu 5918 & 9337, to Pua Kaiwa, Aiea
Mahele Award Book 6:120 (Royal Patent Helu 793)

Mooain of Kaika. Boundaries: Koele; Muliwai; Kahakai; Moo of Paakai; Kepoho 2; Hauhako.

Helu 7344:1, 2, to Kulani for Kalohi
An Auwai in Waihiluna & Kaomuiki, Aiea

Parcel 2. Auwai at Waihiluna. Boundaries: Koele parcel at Wahii; Namoko's land; Koele parcel; Kiga's land; Kaomukii; Kanaana's land; Koele parcel at Waihilii; Waihiluna

Parcel 1. Mooain of Kaomuiki. Boundaries: Koele; Kepoho 2; Paaiia; Kahakai; Puuone of Konoikiai; Kapaakai.
### 4.2.6 Hālawa Ahupua’a – Registered Claims

The following table provides the claims registered from Hālawa ahupua’a. The bolded entries are further explored in the pages following the table.

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Cultural History of 'Aiea and Hālawa

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Helu 2131:1, to Kanihoalii for Kaukiwaa
Koloa, Kamanu, Hālawa
Mahele Award Book 6:109-110 (Royal Patent Helu 457)

Parcel 1. Puʻuone at Kalokoloo. Boundaries: Ili of Pawela on three sides; Pali.
Parcel 2. Loi and Kula in Ili of Kamau. Boundaries: Kamalanai’s land; Koʻele; Konohiki’s Kula; Lot of Wm. Baele; Konohiki’s land.
Helu 2156, to Opunui
Konohikilehulehu, Kaloiki & Pionoewai, Halawa
Mahele Award Book 6:106-107 (Royal Patent Helu 766)

4.2.7 Palapala Sila Nui (Royal Patent Grants on Land)

Even as it was underway, the Māhele was met with mixed results that left a large number of hoa‘aina landless. The King and government officials saw that across the islands, many of the applications made by native tenants for kuleana, had been rejected by the Land Commission. Furthermore, many of the parcels being confirmed as kuleana—particularly in dry regions—were inadequate to support the needs of families as larger areas were required to grow crops for sustenance, and keep newly introduced animals fed. As a result, Kamehameha III initiated a program that allowed native and foreign residents to apply for grants of land—in fee-simple interest—which were a part of the Government land inventory.

At the close of the King’s Māhele with the chiefs and others who were recorded in the Buke Māhele, the King set aside lands from his holdings, placing them in the Government Inventory. ‘Ili lands within ‘Aiea were in the class of government lands. The records of grants include one grant in ‘Aiea.

Table 7 lists this parcel of land which was sold to grantees in this ahupua‘a; the land patent grant is further explored in the pages following the table. The process of applying for “Grant Lands” was set forth by the “Enabling Act” of August 6, 1850, which set aside portions of government lands for grants—

Section 4. Resolved that a certain portion of the Government lands in each Island shall be set apart, and placed in the hands of special agents to be disposed of in lots of from one to fifty acres in fee simple to such natives as may not be otherwise furnished with sufficient lands at a minimum price of fifty cents per acre. [Enabling Act – DLNR 2-4]

The Kingdom’s policy of providing land grants to native tenants was further clarified in various communications like this one dated February 23, 1852, from Interior Department Clerk, A. G. Thurston, on behalf of Keoni Ana, Minister of the Interior, to the Government Surveyor, J. Fuller:

**February 23, 1852**

...You will entertain no application for the purchase of any lands, without first receiving some part, say a fourth or fifth of the price; then the terms of sale being agreed upon between yourself and the applicant you will survey the land, and send the survey, with your report upon the same to this office, for the Approval of the Board of Finance, when your sales have been approved you will collect the balance due of the price; upon the receipt of which at this office, the Patent will be forwarded to you.

Natives who have no claims before the Land Commission have no Legal rights in the soil.

They are therefore to be allowed the first chance to purchase their
homesteads. Those who neglect or refuse to do this, must remain dependent upon the mercy of whoever purchases the land; as those natives now are who having no kuleanas are living on lands already patented, or belonging to Konoȟis.

Where lands have been granted, but not yet patented, the natives living on the land are to have the option of buying their homesteads, and then the grant be located, provided this can be done so as not to interfere with them.

No Fish Ponds are to be sold, neither any landing places.

As a general thing you will charge the natives but 50 cents pr. acre, not exceeding 50 acres to any one individual. Whenever about to survey land adjoining that of private individuals, notice must be given them or their agents to be present and point out their boundaries... (Thurston, 1852:210-211)

<table>
<thead>
<tr>
<th>Grant No.</th>
<th>Book</th>
<th>Grantee</th>
<th>Land Area and Notes</th>
</tr>
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</table>
4.3 Boundary Commission Proceedings: Ahupua’a of ‘Aiea and Hālawa

Following the Māhele ‘Āina, there was a growing movement to fence off large tracts of land which had been awarded to the ali‘i and foreigners, as a means of controlling access to resources which had been traditionally used by native tenants. In the 1860s, land owners and business interests petitioned the Crown to have the boundaries of their respective ahupua‘a, which became the foundation for plantation and ranching interests, settled. In 1862, the King appointed a Commission of Boundaries (the Boundary Commission), and tasked them with collecting traditional knowledge of place, land boundaries, customary practices, and deciding the most equitable boundaries for each ahupua‘a that had been awarded to Ali‘i, Konomoki, and foreigners during the Māhele.

Across the islands, commission proceedings were conducted over the course of several decades under the courts as formal actions under law. When the commissioners on the various islands undertook their work, the kingdom hired or contracted surveyors to begin the surveys. In 1874, the commissions were authorized to certify the boundaries for lands brought before them (Alexander, 1891:117-118). The surveys and proceedings—occurring between 1868 to 1891—resulted in the following maps being produced for the ahupua‘a of ‘Aiea and Hālawa:

- Register Map No. 323 (Figure 10) depicts the Ahupua‘a of ‘Aiea
- Register Map No. 109 (Figure 11) depicts the Ahupua‘a of Hālawa

The narratives that follow include several types of documentation, such as the preliminary requests for establishing the boundaries, letters from the surveyors in the field, the record of testimonies given by native residents of the given ahupua‘a, and the certificate of the Commission in establishing the boundaries of the land. Native witnesses usually spoke in Hawaiian, and in some instances, their testimony was translated into English and transcribed as the proceedings occurred. In the case of ‘Aiea, all of the narratives remain in Hawaiian. Selected translations of the proceedings have been translated by Māly.

The resulting documentation of the proceedings provide descriptions of each ahupua‘a, extending from ocean fisheries to the mountain peaks, and at times describe traditional and customary practices, land use, and various cultural features across the land. The record also includes a number of place names which are evidence of the cultural attachment shared by native tenants with the ‘āina.

In ancient times, named localities signified that a variety of uses and functions occurred, including:

1. Triangulation points such as koa (land markers for fishing grounds and specific off-shore fishing localities);
2. Residences; areas of planting;
3. Water sources;
4. Trails and trail-side resting places (o‘io‘ina), such as a rock shelter or tree shaded spot;
(5) Heiau or other features of ceremonial importance;
(6) May have been the source of a particular natural resource or any number of other features; or
(7) The names may record a particular event or practice (e.g., use for burials, the making of ko'i (adzes), or designation as a fishery) that occurred in a given area.

At least 101 identifiable place names are referenced in the boundary records, extending from the fisheries to the mountain ridges. Several of the place names remain in use on maps or among some residents, while others are no longer in use.

Figure 10. 'Aiea, Ewa, O'ahu (1874, C.J. Lyons, Register Map No. 323, for the Commissioners of Crown Lands, State Survey Division)

Figure 11. Hālawa, Ewa, O'ahu (1848, T. Metcalf, Register Map 109 for Dr. Rooke, State Survey Division)
Place Names Cited in 'Aiea Boundary Proceedings (59 Names Cited)

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<td>Kamaha</td>
<td>Na'ihina</td>
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<td>Ana Kau Puaa</td>
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Place Names Cited in Hālawa Boundary Proceedings (42 Names Cited)

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Aiea Ahupuua
District of Ewa, Island of Oahu
Boundary Commission Volume 1, No. 1, pps. 50-56

Ahupuua o Aiea
No na palena o ke Ahupuua o Aiea, Mokupuni o Oahu

Ma ka la 30, o Novemba, M.H. 1868, ua waiho mai o J.W. Makalena, ma ke kaioho a ka Mea Hano hano J. O. Dominis, Ke Komisina o na Aina Moi e hooperononoi na palena o ke Ahupuua o Aiea, ma ka Mokupuni o Oahu, e like me kana palapa nooni, penei.

Honolulu, Nov. 23rd, 1868
Hon. W.P. Kamakau,
Komisina o na Palena
Aina, Apana H.K. Akahi
Me ke Mahalo.

Ma ke kaioho a J.O. Dominis, keka o na Komisina o na Aina Moi; Ke waiho aku nei ai i lua ou i kea palapa, me ke noi aku, e hooperonono kokeia na palena o ka aina malao nei.


Ma ke kaioho
Owao no me ka Mahalo,
J. W. Makalena

Ua hoopuka ke Komisina o na Palena Aina i Olelo Hoolaho ma ka Nupepa Aupuni Ke Au Okoa, a me ka Nupepa Haoke Aupuni ka Hawaiian Gazette, e like me keia ma ke Au Okoa o ka la 8 o Aperila, 1869 a ma ka Hawaiian Gazette o ka la 7; o Aperila 1869 [page 50]

No ka mea ua noio mai ka mea noa na i oia malao o ka Mea Hano hano Jno 0. Dominis, ke Komisina o na Aina Moi e hooperononoi na palena o ke Ahupuua, Aiea, Oahu. Nolaila, ua hokeia i na mea a pau o ka Poakolu la 19 o Mei, 1869. hana 10 kakahiaka oia ka la a me ka hina hina na ka holoole ana i na palena o Aiea, ma kou hale noho ma Peleula, Honolulu, Oahu.

W. P. Kamakau,
Komisina i na Palena Aina.

Honolulu, May 5, 1869.
Cultural History of 'Aiea and Hālawa

Ua noho ke Komisina Palena Aina e hooloe a laue i o neloa a o hoike e like me ia i hoolahai'a.

Kauaua K., Hoohikia:
Noho au ma 'Aiea, hanau au malaila i ke kau o Kamehameha I, ia Kaniakani nei; he kamaaina au no nāla, he ike ko'ou ma ko'ou mau kupuna mai a me ko'ou mau makua mai o na palena o 'Aiea. "E hoomaka ma ke ka ma kahi i kapaia o Kapunakaka e pilo ana me ke ka i William, holo a ka malo ko kahi i kapaia o Kaeo, ma ke kua mai o na hale o Doctor Ford, holo a hiki i na ili ili e hele holo mai a Kawa'iha (Kahawai), he kahua malaka ia, he wahi hookupu Akua makahiki i holo aku mai la'aila a ka pa o Koi i kapaa Kauaihumuponi, a hiki i ke ahua mai ke ala Aupuni e nana ia i ke kahawai o Hālawa Kalawao [Kalauoa] ma ia Ahu e holo ai a hiki i Puumakani malaila aku a hiki i Kahakulohi, he puu ia malaila aku hiki i ke Ana Kau Pua mai la'aila aku hiki i Nuku malaila aku hiki i ka Puuola, malaila aku hiki i Kealakaha a hiki i ke kahawai, mai la'aila aku holo pali a hiki i ka pukou o Wailea kona [page 51] palena pou koa ia, mai la'aila aku a ke okikina mai la'aila aku a hiki i Pele, mai la'aila aku holo ma ke kahawai, hookahi hapalua no Kalauoa, hookahi hapalua no Aiea mai la'aila aku a hiki i Kahakulaha a mai la'aila aku a hiki i Kahakualua he kauhale kaiwai wai ia, mai la'aila aku a hiki i Hapuu aia koe a holo nei ma ka moo holo a hiki i ka piko o Koolau oia o Komohana me Kailapa ika ia Kahalu o a Koolauapolo, holo ma ke kaai pali a Kailapa, ia Kauakulaha i kaai pali holo mai ma ka moo o Koolau a hiki i Kapehia, a hiki i ke Kahawai [page 51] palena pou koa ia, mai la'aila aku a hiki i Kailihemo, hakele i ka wai holo ma ka malo ko hiki i Puu he kauhahale kaiwai wai ia mai la'aila mai a Wanawana mai la'aila mai holo malalo o ka puu o Awahine e pilo ana me ia Hālawa a hiki i Mananieg hiki i kahawai malo ko la'aila aku a hiki i Kama'ana'ana he kahuahale ia, mai la'aila aku a Kukuiokahi, mai la'aila aku a Puaulani malaila pilo iluna a hiki i kahi i kapaia o Kahuluihe he luakapapa ia he ana, no Hālawa kahi puka a no Aiea kekahi puka e pahao ai i ka kupupaula mai la'aila aku a hiki i Waipio mai la'aila i kapaia o Waipi mai la'aila i Kehaukoea he wahi pana ia, he Ahu a a, holo mai a ke Aawaawa o Kawili mai la'aila a Naiilii ia Maelie holo a hiki i Hālawaihe oia Kahi i Kapaia o Hālawa, mai la'aila aku o Kulina mai la'aila aku o Kapukina mai la'aila o Kanakakokehoe kahi i make ai o Kehinimanina, holo aku a hiki i ka Pohaku i loke o ke kai i kapaia o Makaalae mai la'aila aku a ka hui ana o ke kai ke Hālawa, holo poholei mai keia pohaku a kela pohaku ma ka aaoao e pilo ana me ko William Poomuki. [page 52]

Noho au ma Waiaawa, hanau au ma Kapalama, Oahu hou hou mai au mai Kauai mai i ke kaua ia Kahalāia a me Humehume a nooho ma Kaualoa, hanau au maua o e Kuanohonu oia ka hana ana i ka Papu o Oahu nei a me ko Kauai. Na Keanepaki i hai mai iau i na palena, he Konehoki no Kalauoa, Waleau, Kanepapaahana, Hookaha he mau konohiku lakoai i ka kau o Kamehameha III.

Kalohi (K) Hoohikia:
No ho a e kā hale o Kalohi holo a hiki i ka haupapa he wahi i kapaia o Makaohalewa malaila holo a hiki i ka Mole o Kahakupohaku holo i uk a mawaena a o nā loho Elua Kaikopua no Hālawa, Kahakupohaku no Aiea a hiki i ka honua, ae mai malaila a hiki i kahi i kaui ai ke Ahu Akua o o ka wai Kahiko holo a hiki i ke awaia i kapaia o Kahului, mai la'aila a hiki i ke Ahu i ka Kapaia o Kailapa mai la’aila aku a hiki ka puu o Han o Kulumo no Kauai ma ke Komohana Akua o Aiea Kahī aoao, holo mai a Nahuna mai la'aila a hiki i Kahakulohi, mai la'aila mai a Kameo no Kauaiua ia, mai la'aila a hiki i ke kikietena e nana ia Ka laawao i kapaia o Kauai [Kaua'ui] mai la'aila mai holo a o ka Omuuiki.

Kalohi (K) Hoohikia:
No ho a e kā hale o Kalohi holo a hiki i ka haupapa he wahi i kapaia o Makaohalewa malaila holo a hiki i ka Mole o Kahakupohaku holo i uk a mawaena a o nā loho Elua Kaikopua no Hālawa, Kahakupohaku no Aiea a hiki i ka honua, ae mai malaila a hiki i kahi i kaui ai ke Ahu Akua o o ka wai Kahiko holo a hiki i ke awaia i kapaia o Kahului, mai la'aila a hiki i ke Ahu i ka Kapaia o Kailapa mai la’aila aku a hiki ka puu o Han o Kulumo no Kauai ma ke Komohana Akua o Aiea Kahī aoao, holo mai a Nahuna mai la'aila a hiki i Kahakulohi, mai la'aila mai a Kameo no Kauaiua ia, mai la'aila a hiki i ke kikietena e nana ia Ka laawao i kapaia o Kauai [Kaua'ui] mai la'aila mai holo a o ka Omuuiki.

DRAFT Cultural Impact Assessment Report for the New Aloha Stadium Entertainment District
Hālawa and 'Aiea Ahupua'a, 'Ewa District, Oahu Island

DRAFT Cultural Impact Assessment Report for the New Aloha Stadium Entertainment District
Hālawa and 'Aiea Ahupua'a, 'Ewa District, Oahu Island
Hoomaka ma *Makaohalawa* &C. [page 54]

O ke Komisina o na Palena Aina, mamua o na olole hoike i puka i mua ona, ua hoolo oia i na Palena o ke Ahupua'a o Aia ma Mokupunio Oahu e like me ia i hoikeia malalo iho nei.

**Olelo Hooholo No. 18 (see Halawa Cert)**

See further proceedings Fol. 322.

Hoomaka ma ke kai ma kahi i kapaa o *Kapuniaka* e pili ana me ke kai o Uilama alaia holo a ka maeko kahi i kapaa o *Kape* ma ke kia mai o na hale o Doctor Ford, holo a hiki i na *Hililelele*, mai la'ila aku a hiki i kahi i kapaa o *Kahawai* [Kalawu] he Kahua maika ia, a he wahii hookupu Akua makahiki holo aku mai la'ila a ka pa o *Koi* i Kapaa o *Kauahupunupu* a hiki i like Ahau ma ke Aia Aupuni e nana ala i ke Kahawai o Kalua'o, alaia, holo ma ia Ahua a hiki i Pua'auakani mai la'ila aku a hiki i Kahalauhiki he puu ia mai la'ila aku a hiki i ke ana kau Puna [Ko'okaukaua] mai bila aku a hiki i Niuloa mai la'ila aku a hiki i ka Puuloia mai la'ila aku a hiki i Kapukoko he hiki i ke Kahawai mai la'ila aku holo ma ka pali a hiki i ka *Kuku o Waialua* Kona palena pau koia mai la'ila aku a *Ko'okaukaua*, mai la'ila aku a hiki i *Pu'ukoko* mai la'ila aku holo hou ma ke Kahawai, hooli haka ha'a u a ke Kahawai no Kalua'o, bookahi hapaku a ke Kahawai no Aia, mai la'ila aku a hiki i Kahalehaha, mai la'ila aku a hiki i Kahakaukau, he Kahauhale Kalai waa ia mai la'ila aku a hiki i *Papun*, aia keia ke holo nei ma ka moo holo a hiki i ka pali o Koolau, oia ho'i na wahii i kapaa o *Kanaha* me *Kikeawa*, alaia, ike aku ia Kahaluu ma Ko'aulapoko, holo ma ia kakai pali a hiki i Halawa, ua kapaa ia kakai pali o Kakaulukui, alaia, holo mai ma ka moo i kapaa o *Pepeha* a ihe ia ke kahawai i kapaa o *Nalili* he wahii kahi olona ia a Kanu awa, ma'alaia aku holo o *Iholena* he Kahauhale Kahi Oi'ona a Kalai waa ia ma'alaia aku holo a hiki i *Kahalehaha* — he Alama pi i a ia honua e pili [page 55] ana me Halawa, mai la'ila aku a ke Kahauhale i kapaa o *Kapuka* mai la'ila aku a hiki i *Papua* he mahina ai ia mai la'ila aku a hiki i *Kulihemelo* ahi heala e ka wai holo ma ka malo a hiki i *Puna* he Kahauhale Kalai waa ia, mai la'ila mai holo a hiki i *Wanawana* mai la'ila mai holo malalo a ka pui i Kapaa o *Aiwahi* e pili ana me Halawa a *Manohele* hiki i Kahawai malo mai la'ila aku a hiki i *Kapuina* he Kahauhale ia i Kapaa o Kukuiio'okalainia, mai la'ila aku a hiki i *Kapuini* mai la'ila pi i luna a hiki i kahi i kapaa a *Halualu* he Luakupapau ia he Ana no Halawa kekahi puka a no Aea kekahi puka, ma'alaia aku a hiki i Kahai awawa i Kapaa o *Warano* mai la'ila aku a hiki i kahi i Kapaa o *Kahaukona* he Ahau Aa holo ma ke *ke awawa* i Kapaa o *Kawili* mai la'ila aku holo a *Nalili* a *Maeli* holo a hiki i Halawa — Hale oia kahi i Kapaa i'oi *Halawa*, mai la'ila aku a *Kulina*, mai la'ila aku a Kapuka a mai la'ila aku a *Kapuakoko* he kahi i make ai o *Kalanimanuia*, holu aku a hiki i ka pohaku iloko o ke kai i Kapaa o *Makaia*, mai la'ila aku a ka *Hui anoa* o ke kai me Halawa, alaia, holu pololei mai keia pohaku a hiki e kola pohaku ma ka ao'ao e pili ana me ko William Poomuku.*
Ahupua'a of Halawa
District of 'Ewa, Island of Oahu
Boundary Commission, Oahu, Volume 2, No. 1:163-164

Boundaries of Halawa
Application
Honolulu, July 26th 1873

L. McCully Esq.
Commissioner of Boundaries

Sir,
His Excellency, the Minister of the Interior has declined to issue a Royal Patent
on the basis of the decision of the late Commissioners of Boundaries relating to
the boundary between the Ahupuaa of Aiea & Halawa in the District of 'Ewa.

As Administrator of the Estate of the late Mrs. Cooke, I therefore beg to apply to
you for the settlement of the boundaries of the Ahupuaa of Halawa in the District
of 'Ewa, granted to her by Land Commission Award No. 8516.

Very Obediently Yours,
H.A. Widemann
(Private)
Department of Interior
Honolulu, July 25, 1873

Hon. H.A. Widemann,

Sir,
Your Application for a Royal Patent for the Ahupuaa of Halawa, District of 'Ewa,
Island of Oahu, of this date, has been received.

In reply, I have examined the description given of the boundary of said land by
the late Commissioner of Boundaries and consider it altogether too indefinite to
be embodied in a Royal Patent; and for this reason must decline to comply with
your application.

Your Obedient Servant
Edwin G. Hall, [Oahu, Volume 1:163]

[Note: Original register pages with memorandum attached, and are in poor
condition, and some sections illegible.]

[End of 1st page]

October 23rd 1874
From the Aiea testimony, page 51

Kauaua says it begins at Kapuniokai'a thence to Kaaeo back of Dr. Ford's Kauawi
he Kahua maika &c. between Aiea & Kalanui. For the line between Halawa &
Aiea according to this wit. see on page 52, reading from the bottom of page.

Puakai p. 53, says begin at Kamaka & Halawa a point in the water marked on
map.

Thence between the fish ponds
Thence in Aowawa called Kauwi
Thence to Aiea called Lulep
Thence to
Uwau
Thence down the other side of Aiea. This [illegible] to agree with Aiea as
surveyed by [Makalena].

Kohohi p. 54 – Joins Halawa at
Thence down ridge to
Koolau pali
Puna
Wavanawa
Aiwahine
Kahanukau;

Keawe - makes the line between Halawa & Aiea at the fish ponds — goes up to
Uwau.
Kauahiko – makes Halawa begin at Maka o Halawa

[End of 2nd page]
IX.

Oct 23, 1874
From the Aiea ... page 51
**Kauaua** said it began at **Kahuiola**.

(2)

Kauaua page 52 - makes the boundary of Aiea on the Halawa side
From Koolau ridge, down ridge
called

**Punahoa**

**Kahalaloa**

**Kapulehu**

**Mahina**

Kulihemo where it leaves the "wai" & goes to **Puna**, canoe maker's house

Thence up

to

Dry gulch
Kauauahele
Kuualamaniu
Kukaiolohina
Pokolani
(Cave for burying)
Halakahale
Waiapa
Kahuahea
Gulch of
Kawiihi
Naheili
Halawa
Halawahale
Kunia
Kapukapu
Kapukakokekoke

Beginning of H. [Halawa] Pohaku iloko o ke kai called **Makakaham**.

[memo continued – page 164 duplicate]

**Ahupuaa of Halawa**

**District of Ewa, Island of Oahu**

**Boundary Commission, Volume 1:** 334-335

From Folio 164

Beach called **Kumuma'u** on the West bank of a small stream; the Station point

being marked by coral stones buried in the sand so as to form a cross with point thus [upward arrow on cross] indicating true North, and from whence the following azimuths from a true meridian are observed:

- **Pauloa (triangle) Station 106° 50' (distant 8220 ft.)** Ewa Church 157° 53'; Salt Lake Station, 219° 01'; Diamond 294° 47'; the magnetic declination being 9° 35' E. and running as follows, all bearings being from a true meridian:
  
  I. N. 6° 00' 0. 3510 ft. along Moanalua and the Kalili fish pond **Lelepuau** to E. angle of the fish pond **Waihoa** adjoining old salt works; whence
  
  II. N. 13° 50' W. 3475 ft. along Moanalua crossing the Pauloa-Honolulu road to a pile of coral stones, whence Ewa Ch. bears 152° 24'; **Salt Lake** 234° 54'; whence
  
  III. N. 47° 05' E. 12800 ft. along Moanalua to an iron stake on the ridge surrounding **Aliamanu** where Salt Lake Station bears 255° 54'; whence
  
  IV. N. 34° 10' E. 1720 ft. along Moanalua and the ridge above mentioned; whence
  
  V. N. 77° 50' E. 4040 ft. along Moanalua, leaving the ridge on the right to the ancient land mark called "Ke Kamanau o Kapukuki" whence Salt Lake Station bears 13° 02', distant 1160 ft.; whence
  
  VI. N. 53° 45' E. 675 ft. along Moanalua, to rock marked H & M makai of Govt. road; whence
  
  VII. N. 66° 24' E. 11140 ft. along Moanalua, up dividing ridge to red hills; whence
  
  VIII. N. 5° 44' E. 14650 ft. along Moanalua, the boundary being the watersheds of the dividing ridge of the Halawa & Moanalua Valleys to point marked B Peak over looking Koolau; whence
  
  IX. N. 5° 47' E. 4510 ft. along Heia in Koolau, the boundary being the summit ridge of the mountain **Mauna-Kapu**, to peak marked No. 5; whence
  
  X. N. 17° 43' W. 2075 ft. as above, to peak marked No. 3; whence
  
  XI. N. 76° 15' W. 2460 ft. along Koolau, probably Kahalu, to peak marked N. peak adjoining Kauaua, said peak bearing from Salt Lake 225° 26', 294° 51 ft.; whence
  
  XII. S. 6° 24 W. 8840 ft. as above, to peak **Uwau**. at the head of Aiea Valley; whence
  
  XIII. S. 26° 00' W. 1880 ft. along Aiea, the boundary being the watershed of ridge; whence
  
  XIV. S. 54° 30' W. 5330 ft. as above, to point **Kualamahee**, mark Maltese cross in ground; whence [Oahu, Vol. 1: 334]
  
  XV. S. 88° 1 W. 1086 ft. along Aiea, and ridge to point **Poohola** on brow of a hill; whence
  
  XVI. S. 54° 38' W. 4856 ft. along Aiea **Pohukumume** a marked and legendary rock, whence Salt Lake Station bears 348° 43' distant 7883 ft.; whence
  
  XVII. S. 60° 53' W. 5190 ft. along Aiea, to flat rock marked "HALAWA" mauka
5. MODERN HISTORY OF THE PROJECT AREA AND ITS VICINITY BEGINNING WITH FOREIGN CONTACT AND THE CHANGING LANDSCAPE OF 'EWA DISTRICT

The history of the people and lands of 'Ewa have always been linked by their trails and access to land, ocean, communities and resources. There are thousands of historical accounts in both Hawaiian and English language that describe the 'Ewa District. The narratives were penned by native Hawaiians, foreign visitors and residents, and include some of the earliest accounts describing the lands of 'Aiea and Hālawa following Western contact. These narratives provide an overview of: (1) changes in the landscape; (2) the decreasing Hawaiian presence; (3) loss of wahi pana and noted places; (4) development of ranching and plantation business interests in the region; (5) concerns about United States control over Pearl Harbor and “Reciprocity”; (6) the changing make-up of the communities; and (7) travel on the land. The nature of history and the events leading to the present day are inclusive of regions, thus many of the accounts include references to the larger landscape of 'Ewa.

The texts that follow are generally cited chronologically, by period or activities being described. They are eyewitness accounts of what has become our community history. We have identified several primary categories into which historical records are presented. These sub-categories include:

- Kamaʻaina and Visitors Descriptions – Travel in the 'Aiea-Hālawa Vicinity and Larger 'Ewa District
- Ranching and Other Business Ventures in the 'Aiea-Hālawa Vicinity
- Plantations and O‘ahu Railway & Land Company Development
- Condemnation and Military Base Development by the United States

The narratives—largely presented as article clippings from primary sources—provide a wide range of resources for exploring our community landscape and the experiences of those who came before us. They help set a foundation for interpretive and educational initiatives to promote awareness of, and appreciation for the history of our island home.

5.1 Kamaʻaina and Visitors Descriptions – Travel in the 'Aiea-Hālawa Vicinity and Larger 'Ewa District

The historical record shares a wide range of descriptions of the 'Aiea-Hālawa landscape, life of the people, expressions of aloha for place, and the cultural attachment shared by Hawaiians in their living environment. The narratives below were found in Hawaiian and English language sources and reflect both native and foreign experiences and observations on the land. The texts include some of the earliest descriptions of the native communities shortly after Western contact; provide descriptions of travel across the 'Ewa District (as well as the evolving trail and road systems); include mele describing the cultural landscape; and cite first-hand accounts of the challenges faced by native residents and loss of access and title.
to the land. The excerpts of articles help us understand how quickly change came to the land and lifeways of the people.

Much of the change on the land and in the communities was tied to the development of economic ventures, most of which required large tracts of land and a cheap work force, other than the native population. While ranching interests were among the earliest economic drivers, it was the plantations that completely changed the face of ʻIwia. Starting with the ʻIwia Plantation in Honolulu and followed by the ʻOʻahu Sugar Company based out of Waipāhia, and the Honolulu Plantation Company based out of ʻAiea, nearly every ahupuʻa in the district of ʻIwia supported tens of thousands of acres of sugar cane, and the rapid growth of an immigrant population. All the lands, crops and people were connected by a new railway developed by the ʻOʻahu Railway and Land Company. Plantation camps grew and at key areas they became the population centers, and communities we know today. By 1890, lands around the government road and railway line in the area of the Mānana-Waimāno Peninsula became known as “Pearl City.”

5.1.1 Lord Byron at the Sandwich Islands – Extracts from the Diary of James Macrae (1825)

In 1824, Liloliho (King Kamehameha II), his wife Kamāmalu, and a group of retainers and foreign advisors, traveled from Hawai‘i to England. Liloliho and his wife died in England and their bodies were returned to Hawai‘i by Lord Byron in May of 1825. While in the islands, James Macrae, a botanist traveling with the Lord, traveled to various locations in the company of native guides, where he observed and collected biological samples. One of Macrae’s journeys along with Lord Byron and party took him to Pūʻulena, where he described the scene:

**Trip To Pearl River Or Harbour**

...May 17. Joined Lord Byron’s party, with Mantle carrying my traps. We did not embark until noon. After two hours [page 28] sailing along the coast, we entered the mouth of the Pearl River, which divides itself into several branches, forming two islands. One which is smaller than the other is called Rabbit island [Moku‘ume‘ume], from a person, the name of Marine [Marin], a Spaniard, residing at Hanarura, having put rabbits on it some years ago. The rabbits have since increased in numbers.

It became so calm, that his Lordship, Mr. C, and the Bloxoms left us in the launch, and rowed in the small boat in tow, and soon disappeared from sight. We waited in suspense, hour after hour, not knowing the several branches of the river, nor where we were to spend the night. The boat party pulling into one branch of the river, the other in which I was tacking about from bank to bank till the boaters hauled their boat ashore and we cast anchor. Both parties were opposite each other on Rabbit Island, but ignorant of the fact, till on walking about the island, the parties met. One hut was noticed, and those on the island made for it, but the launch having the ladies and some others on board, got up anchor and sailed round to the hut, where with the help of canoes, they all landed. The ladies were somewhat discontented, but after a good dinner partaken sitting on mats spread on the grass, harmony was restored.

At dusk we embarked to cross to a larger hut. Landed at 8 p.m. At ten o’clock two old men entered our hut to play the hula dance on a couple of bottle shaped gourds. They took a sitting posture, beating time on the gourd’s with the palms of their hands, accompanied by a song made up about the late king.

About 11, we all retired to rest, lying down beside each other on mats, some with pumpkins or what else they could get for a pillow. The ladies got themselves screened off in a corner with a flag without any other accommodation.

Pearl River is about seven miles west of Hanarura, and is improperly called a river, being rather inlets from the sea, branching off in different directions. There are three chief branches, named by the surveyors, the East, Middles and West Loughs. The entrance to Pearl River is very narrow and shallow, and in its present state it is fit for very small vessels to enter, but over the bar there is deep water, and in the channel leading to the loughs there are from 7 to 20 fathoms. The loughs themselves are rather shallow.

The coast from Hanarura to the west of Pearl River possesses no variety of plants beyond two or three species, such as page 29 Argemones, Portulacas, and a few other little annuals, intermixed with the common long grass so plentiful everywhere on the coast round the island.

**Oysters**

The oysters that are found in Pearl River are small and insipid and of no value or consequence.

**Returns By Land**

May 18. Got up at 4 a.m., after a restless night, having been tormented with fleas. Departed with my man Mantle, leaving the rest yet aslep. But after travelling about three miles, the path which we had first struck terminated, and the grass became longer and more difficult to travel over. At last, after another three miles, we got so entangled with creeping plants running a little above the ground beneath the grass, that Mantle, who was stockless, shed tears, complaining of his ankles, and refused to go on. Being yet five miles from the woods, and not haying sufficient provisions for two days, we were forced to return to the town by a path leading through taro ponds, some distance inland from the coast.

On the path we had left near the Pearl River, we saw several thickly inhabited huts, situated on the side of a ravine stocked with bananas, taro and healthy breadfruit trees just forming their fruit. Here we met with an old Englishman,
who told us there was on the opposite side of the ravine a large river coming out under the ground. We went to the place and found that what he had told us was correct, and stood admiring the subterranean stream of fine, cool water. Its source was rapid, forming a cascade nearly 20 feet in height, having ferns and mosses on its sides. In the grounds of the natives, I saw plenty of the awa plant (piper) mentioned in the history of these islands, as being destructive to the health of the natives when used to excess, owing to its intoxicating qualities. I obtained several specimens of it in flower.

The old man informed me that he had been on the island over sixteen years, and that the grounds we were then upon, belonged to Boki, and had been in his charge for ten years. Upon Boki going to England with the king, another chief had turned him away, and taken all his little ground from him, so that he had been forced to live on the charity of the natives. [page 30]

Ewa District

The neighbourhood of the Pearl River is very extensive, rising backwards with a gentle slope towards the woods, but is without cultivation, except round the outskirts to about half a mile from the water. The country is divided into separate farms or allotments belonging to the chiefs, and enclosed with walls from four to six feet high, made of a mixture of mud and stone. The poorer natives live on these farms, also a few ragged foreigners who have a hut with a small spot of ground given them, for which they must work for the chiefs a certain number of days besides paying an annual rent in dogs, hogs, goats, poultry and tapa cloths, which they have to carry to whatever spot their masters is then living on the island. On the least neglect to perform these demands, they are turned away and deprived of whatever stock, etc., they may possess. Such is the present despotic or absolute law in the Sandwich Islands. This is corroborated by all foreigners met with at different times, who, on our arrival, hoped that Lord Byron would render them their little property more secure in future. Unfortunately they must wait till the British Consul helps them, as we have no authority to interfere with the laws of the country.

On our way home we noticed that the country on the side towards the woods still remained uncultivated, also towards the sea coast, except the lower ends of the small valleys which are cultivated with the taro in ponds, which much resemble peat mosses that had been worked and afterwards allowed to get full of stagnant water. There is no convenient road to travel anywhere on the island. We met with another subterranean river at the side of one of the hollows, larger than the other, but of no great fall after its appearance from underground.

Moanalua Hill

By 4 p.m. we gained the summit of a high hill, thickly covered with tufts of long grass. It lies within three miles of Hananuva. There is a burying ground of the natives at the top, which was formerly where the chiefs of high rank had a moral. At the bottom towards the sea, there is a circular salt pond, nearly two miles in circumference, surrounded by low conical hills. In [page 31] places on the sides of a valley leading to the pond from the interior, are several huts of the natives with taro ponds and a large grove of coco-nut trees, apparently very old from their height and mossy appearance. We reached town about six o’clock having travelled twenty miles since morning without much success, being too near the coast to meet with a variety of plants. We learnt, however, a good deal about the present mode of life of the natives, and the manner in which they continue to cultivate their grounds, differing but little, if any, from the descriptions given Capt. Cook and others.

May 19. Fine. Saw to my specimens. Lord Byron and the surgeon called to hear particulars of my journey home from Pearl River. American missionaries called and invited me to return the visit. Mantle still complained of this feet, but will go in the morning to the woods with me. Mr. Bloom came accompanied to the woods, but by 8 a.m. he had said he had shot enough birds to skin and would go home. I asked him to shoot a few for me, as he had enough for himself, but he refused, saying all his duplicates were for Lord Byron... [Macar, 1922:28-32]

5.1.2 Tours Made around O’ahu (1826 & 1828)

In 1820, the first contingent of Protestant missionaries associated with the American Board of Christian Foreign Missions (A.B.C.F.M.) arrived in the Hawaiian Islands. The Honolulu station became the focal point of the missionary’s operations, with sub-stations on the major islands, in the largest population centers. Periodically, the Honolulu station managers would travel around O’ahu to inspect the progress being made in work in the outlying stations, including church work, educational endeavors, and facilities to support the living condition of the foreign missionaries. Levi Chamberlain (1828) toured O’ahu in 1826 and 1828, writing fairly detailed descriptions of the districts he visited, including Waipio’s, Waiau and the larger ‘Ewa District. Excerpts of Chamberlain’s original handwritten notes follow below (digitized from the A.B.C.F.M. archives at Harvard, by Kumu Pono Associates LLC in 2004).

September 12, 1828

Levi Chamberlain to Rufus Anderson

A Visit to ‘Ewa to Examine the Schools and Determine Progress in Education of the Natives.

(Typed from a copy of the original handwritten letter in the collection of the A.B.C.F.M., Houghton Library, Harvard – Reel 794)

About two years ago I performed a tour around this island, and I have recently made another. It was my intention to give you a brief account of my first tour, but I could not find time to do it while the scenes that passed under my

---

11 In Hawaiian “heienu.”
12 Known as Alupakaui.
observation and the events that transpired were fresh to my mind & retained their hold upon my feelings.

Sabbath Feb. 10th. The people of Waikiki & the neighboring lands assembled in the forenoon to the number of 150 or 200, whom I addressed from Ecc. VII: 29, "Lo this only have I found, that God hath made man upright, but he had sought out many inventions." I gave as well as I was able an account of the creation of man in uprightness; his fall & its consequences; God's displeasure against sin as exhibited in the destructions of the old world by a deluge. The long suffering of God & many ingratitude's & hardness of heart; & the mercy of God in providing a Savior and the [page 30] folly and guilt of man in refusing proffered salvations. The people in general gave good attention & seemed to feel an interest in what was said to them. I had to regret that I could say so little & that only with a stammering tongue; but as God sometimes employs the feeblest means to accomplish his purposes, I could not but hope that some foods might result from what had been said. The number of persons who assembled in the afternoon was not more than half as great as was the number in the morning. I read the account of the condemnation, crucifixion & resurrection of Christ.

[Waipio and Waiawa Villages]

Monday Feb. 11th. As soon as it was day, we began to make preparations to proceed on our way. We attended morning devotions and at 20 min. after 6 o'clock, we set out for the village of Waipio. On our arrival there, we found a school assembled, which we examined. The head man of the place had the care of the school, and he seems to feel very desirous that the scholars should appear well. As soon as the examination was closed, a baked hog & some nicely cooked kalo was brought in and presented to me, and another hog was brought forward for my attendants. We refreshed ourselves and at 365 min past 8 o'clock we set out, and in about half an hour reached Waiawa, where we found to small schools met for examination. We examined them, and at 10 min. before 10 o'clock took our leave and in 55 minutes arrived at Kaluaoa. The teacher not expecting an examination was not prepared on our arrival to present his school. We waited some time for the scholars to come together & when they were ready the teacher called upon the class to exhibit. I was pleased with the order & regularity of his school, which I regard as one of the best I have [page 31] met with on my tour. I made a short address to the scholars, and in conclusion offered a prayer to God. I have felt much encouraged to persevere in the course I have planned for myself when I commenced the tour, from the fact that the behavior of the scholars in time of prayer has been uniformly respectful, and their attention to his Christian duty, apparently solemn.

At 25 min. past 12 o'clock, we set out from the school house, and at 15 min. before 2 o'clock arrived at Moanalua a small well cultivated valley about 4 miles from Honolulu. We waited about half an hour for the assembling of the scholars which took place at the house of Hoomoolaua, the head man. Having attended to the examination, with which upon the whole I was well pleased, at 10 min after 3 o'clock set out with my attendants for Honolulu; on our way either we stopped at Kalihi & Palama, and attended to the examination of 4 small schools. Just as the sun was sinking below the horizon, I reached the mission house after an absence of 13 days & 8 hours; having experienced during the whole of my journey the divine protection and favor, & having examined sixty three schools containing 1,583 scholars; of whom 629 could read in place reading; 307 in spelling; 460 were acquainted with the alphabet, but not able to spell, and 189 in the alphabet, but not perfectly acquainted with the letters. In the whole number I found 150 able to write upon the slate... [page 32]

5.1.3 A Botanist's Visit to Oahu - Journal of Dr. F.J.F. Meyen's Travels and Observations about the Island of Oahu (1831)

Franz Julius Ferdinand Meyen, a Prussian doctor, visited the Hawaiian Islands in 1831 on the Princess Louise, under the command of Captain Wenzel. Meyen spent only a few days on Oahu before his ship continued its voyage of discovery. While on the island, he traveled to "Pearl River" and provided readers with a glimpse of the landscape, residence, and land use in 1831 [Meyen, 1881]. Meyen's route took him along the former shore line and across walled fishponds from Kalihi into Moanalua.

To Pearl River

...June 30th. We used this day to make an excursion to the Pearl River, which runs through a valley and into the ocean at the southwestern corner of the island, about three miles from Honolulu. One can go there either by sea in a boat, in which case one then travels up the length of the river, or, if we may express it this way, half by water and half by land on a horse. We took the latter way in the company of the charming Dr. Rokee. This way took us for more than an English mile through the royal fish ponds which at low tide are easy to cross and thus shorten the way considerably, though the horses were up to their bellies in water the whole time. These fish ponds are large water basins which are situated right next to the ocean shore but surrounded by walls of coral rock and thus separated from the sea. Various small holes in the bottom of the wall allow the fish to freely pass from the sea into the basins but they are then prevented from returning. In Lord Byron's account one can find an illustration [page 60] of these royal fish ponds. At high tide one must make one's way further inland, where there is not as much water but there are deeper ditches and even small and very deep streams to cross.

As soon as one has passed through this unpleasant waterway one enters fruitful and well cultivated valleys along a stream which empties into the sea. We stopped off at a hut in which two canoes were being outfitted with provisions for a long journey. The woman of this humble hut lay stretched out on a mat in the middle of the hut. Another woman who was just preparing to leave went to her and bent over her to press their noses together in farewell. All this happened without a word being said. The departing woman got up and
It her pipe, wherupon the hostess began to wail and scream violently, without shedding a single tear.

For a while we rode along the stream which was lined by beautiful vegetation. Several Indians came by and offered pearls for sale. They asked one real [6 Silbergroads] for 4 or 5 pearls but they were small and of inferior quality. After a half hour we entered a wide valley which was covered with an extraordinary number of food plants. Bountiful taro fields covered the plain and countess coconut palms, with several huts in their shade beautified the country side. We stopped off at the home of some friendly Indians and quenched our thirst with a watermelon—which we always preferred to coconut milk. In the huts of this fertile area we also saw some pigs and little dogs, which were being fattened. The former are very clean little animals here on the Sandwich Islands and one frequently sees women holding them in their lap or in their arms and letting them eat from their hand. At least such friendliness is extended here just as frequently to the little pigs as to the dogs.

From these last hills our path went steeply up Mauna-rea [Maonaia], an old extinct volcano with an elevation of about 300 feet. The eastern slope of the volcano consists solely of layered grays of a grayish-brown color (Brown basalt tuff with a brown earthy, slightly ferriferous surface coating) which trends northwest. Other places, especially the inner and upper rim of the volcano, consist of the bluish-gray blistered basalt (Basalt, gray, somewhat porous with many extremely small, white particles mixed in, which seem to have a feldspar-like component) of which all [page 61] the mountains of the island are formed.

On the top there was a crater-shaped depression containing an accumulation of salt water [at Aliapa‘akal], which is supposed to be covered by a crust of salt during the dry season. On the northeastern side like two mountains which are the remains of the rim of an old crater. The one further to the north is situated higher and consists of thin layers of blistered basalt which trend about 18 degrees northeast. The layers of the other mountain which is situated more to the south are completely parallel and run horizontally. These two peaks are given the name Moanaia, which means “two mountains.” We think that the old crater of this volcano lay to the west of these two peaks and that therefore the basin of the lake is by no means the former crater. Mr. Hofmann had found olivine and olivinite in the basalt of this mountain. The former, as well as augite, is among our specimens. The route which goes over Moanaia is very monotonous and covered everywhere with boulders. Further on, where the rock is weathered, the vegetation is more abundant. Indeed, the rock of Moanaia is the least weathered of the four volcanoes which we saw on Oahu. Perhaps it was also the last one to erupt.

From this mountain on we progressed quickly, although there was not even a suggestion of a cleared path. We saw several plantations of Bohmeria albida

Hook [perhaps wauke], that plant which is usually used to make the fine tapas. This plantation had a very neglected appearance. Many young saplings could not be seen for the weeds. They do not let these little trees become very tall; rather they prefer to use the young saplings when they are 2 or 3 years old. Presently we reached the valley in which the Pearl River flows. At this mouth this river is more than three leagues wide and it runs from south-southeast to north-northwest. For the first two leagues near the coast the whole valley is very low but then it gradually rises more and more and runs through o the northwestern tip of the island. On the western side of the island arises a separate mountain range which is covered with the most magnificent green. This range does not attain the elevation of the eastern range which runs the whole length of the island. [page 62]

Our short stay on Oahu did not permit us to visit this western mountain range. It has not, we believe, been visited by naturalists and is the only place on the island of Oahu where one can still find some sandalwood. At the mouth of the Pearl River the ground has such a slight elevation, that at high tide the ocean encroaches far into the river, helping to form small lakes which are so deep, that the long boats from the ocean can penetrate far upstream. All around these water basins the land is extraordinarily low but also exceedingly fertile and nowhere else on the whole island of Oahu are such large and continuous stretches of land cultivated. The taro fields, the banana plantations, the plantations of sugar cane are immeasurable. Near the homes which form the village of Mannoneo [Mānana] stand coconut palms, shaded by the magnificent foliage of the breadfruit tree. Here is also the wealthy estate of Don Francisco De Paulo Marin, a man of ordinary education but of noble sentiments, whose name will always rank foremost in the history of civilization of the Sandwich Islands, even when the names of the missionaries will have long been forgotten. Marin introduced the most useful plants from around the world to the Sandwich Islands. The cultivation of these plants will one day be a source of great wealth for the Sandwich Islanders. The Guatemalan coca which Marin cultivates is one of the highest quality and perhaps equal to that form Manila, which, because of its high price, does not even appear in our commerce. The coffee tree, limes, oranges, fine grapes, and beautiful papaya which was brought from the Marquesas, the tamarind, cotton, the most beautiful pineapple and many other fruits can be found on the estate of this Spaniard who was once a counselor to King Kamehameha I. Indigo was brought from Batavia by Mr. Serriere and grows to extraordinary perfection on Oahu; however, it is not allowed to be cultivated on a large scale. Neither is sugar or coffee, though it would give thousands of idle Indians employment and good nutritious food. A sugar mill which was in operation here earlier had to be shut down again. Only the ignorance of the missionaries, only their lack of general education and knowledge of human nature, could have brought about such absurd management. [page 63]

The estates of Marin are extremely well managed and could serve as a model
5.1.4 No Keia Pae Aina. No Ka Helu Ana o Kanaka (A Census of the People in ‘Ewa) (1835)

The newspaper Ke Kumu Hawai‘i was one of the earliest missionary publications and presented various facets of Hawai‘i’s “progress” in being Westernized for public education. The paper included articles by foreign missionaries and Hawaiian leaders in the mission station. The following article details population statistics from the ‘Ewa District for 1835.

Ke Kumu Hawai‘i
No Keia Pae Aina. No Ka Helu Ana o Kanaka

Kepakemapa 2, 1835 (aoao 140)

Ea kekahia mau mea i ae like ai na misionarii ko makou halawalana iho nei.

E helu, a kakau ma ka palapala i ka poe i make, a me ka poe keiki i hanauia. A puni ka makahiki akala e houhulu, i akaka ai ka mea i o, o ka poe make paha o ka poe i hanauia paha.

E helu pono ho i na kanaka a pau loa o keia paeaina, me na wahine me kamali. O na kanaka maoli ma kekahia palapala o na haole ma kekahia palapala. A e haawi aku i ka poe malama i ka oihana pia palapala ma Honolulu. Aole e hoopane aku a hala mai ka mua o Novembar.

Nakila, ua helu iho nei Mi Kemitia i na kanaka a pau o Ewa a me Waianae, a hoike mai penei.

Na kanaka o Ewa a me Waianae, Iulai, 1835.
5.1.5 ‘Ewa Described in Notes of a Tour Around Oahu (1839)

In 1839, E.O. Hall and a group from the mission in Honolulu traveled around the island of O‘ahu, visiting various localities. His notes from the journey were published in Volume II, No. of The Hawaii Spectator, under the title of “Notes of a Tour around Oahu” (1839). Hall’s narratives include descriptions of places visited, changes in agricultural endeavors and, living conditions, with descriptions of Moanalua, Salt Lake and the general environs of ‘Ewa. Hall journeyed along the former coast of the Kalihi-Moanalua vicinity (in the present-day buried under new land) and then cut inland to the area on the mauka side of Ali‘i‘a‘kai and Kapikai‘ili.

[Traveling from Honolulu to Moanalua]

The objects of the tour were, principally, to become better acquainted with the people, by seeing them at their own houses; and, by being cut off from the English language for a time, to acquire of the people among whom I expect to spend the remainder of my days...

As the journey from Honolulu to Ewa, or Pearl River, is so frequently made, it will be unnecessary to dwell on that part of the route; unless it be merely to say, that after the first mile is passed, most of which is through the sea where one has to ride in a most uncomfortable position or get at least his feet wet, the road is quite pleasant. After leaving the sea, and galloping for half a mile or more over a level formation of coral, elevated a few feet above the level of the sea, and partially covered with soil, you arrive at a small valley where the road in the wet season is very uncomfortable, but in the dry, is passed without difficulty. A mile or two further on, and you come suddenly upon the edge of a precipice which is so high that you find yourself far above the tops of the cocoa nut trees, with which the valley [Moanalua] below is filled.

To one unaccustomed to such excursions, and such road, the descent into this and other valleys on the island, on horseback, requires some nerve to get along comfortably; for it is sometimes almost perpendicular, and accomplished by a winding path, where the faithful animal on which your ride dares hardly venture to raise his feet from the ground, lest the downward tendency should give him an impulse beyond his control... [page 95]

But to return to the little valley [Moanalua], about three miles from Honolulu on the road to Ewa, overlooking which we left you a moment ago. On looking down, you behold a large grove of cocoanut trees, some of which give evidence of having been blown upon with no ordinary breath; appearing to have been nearly prostrated when about twenty feet high, the again shot up in perpendicular direction, and now present the curious phenomenon of living trees, the upper have of whose trunks are almost a right angles with the lower. It is a little remarkable that the surrounding trees on every side are perfectly straight.

Passing across this valley, and ascending the opposite bank, the next object of interest to attract attention is the Salt Lake. This is a natural curiosity well worthy visiting, especially in the dry season, when the whole margin, and sometime the bed itself, is covered with beautiful salt in immense quantities. It is about one fourth of a mile distant from, and a few feet higher than the sea, and is connected with it by a hole in the centre.

The rest of the way to Ewa presents little of interest to the traveler. There are however several beautiful spots, where the eye will rest with delight, when the blessing of civilization and Christianity shall have through amund them the comforts of other lands; and systematic agricultural pursuits have covered the field with golden harvests, and filled the lap of the cultivator with the prolific bounties of a beneficent Providence. Ewa is a place of little interest to the tourist except in a moral point of view. In this respect, however; its inhabitants, about 3,500 in number, may be regarded with peculiar pleasure by the philanthropist and Christian; for their improvement in morals, and consequently civilization, during the past four years is very striking. And the attention they are beginning to bestow upon their persons, children, houses, yards, etc., in the immediate vicinity of the missionary establishment is far better evidence on the subject of missionary influence, than any other that can be obtained [Hall, 1839:95–97].

5.1.6 Missionary Recollections of ‘Ewa (1836–1900)

Sereno K. Bishop, son of Reverend A. Bishop, moved to Waia‘ina in 1836. Though not friendly
to Hawaiians or their kingdom. S.E. Bishop recorded observations of the changing environment, social situation, and economics of Hawaii. Reverend A. Bishop oversaw the 'Ewa mission station out of the church at Hā'upu and also assisted in conducting land surveys during the period of the Māhele. S.E. Bishop went on to manage the lands awarded to the A.B.C.F.M. The narratives below, published in The Friend (1901), provide some of Bishop's recollection of his early life in 'Ewa and of changes over time.

The Friend
Old Memories of Hawaii by S. E. Bishop.

May 1901 (pages 4-6)

Rev. Artemas Bishop, in the summer of 1836, removed with his wife and two children from Ka‘ūa, Hawaii, to Ewa Oahu. A chief cause for the change of parish was the impaired health of Mrs. Bishop, in whom hard work as a schoolteacher in a very warm climate had produced some degree of nervous prostration. This gradually abated in the cooler breezes of Ewa, with abstinence from school work, although the energetic missionary still applied herself to active labors among the women who met on our premises in great numbers.

Our predecessors at Ewa were Rev. and Mrs. Lowell Smith, especially capable and devoted missionaries who had been only two years in the field. Mr. Smith had built a comfortable house of adobe bricks, thatched with grass, and well plastered inside and out. He had also erected the adobe walls of a church, capable of holding an audience of about one thousand people. I think the roof also was on. Mr. Smith took up his residence in Honolulu, at first engaging in organizing and superintending day-schools, but soon organizing a second parish in the capital, and building the old Kaumakapili church. The architecture of this as well as the Ewa church was simple and homely. The adobe walls 15 feet high were covered by a steeply pitched roof, which extended out in a verandah on all four sides, in order to protect the base of the mud walls from being destroyed by rain-drip. The timbers on the roof were long beams dragged from the mountains entirely by human strength, the labor being secured by volunteering under the leadership of the chiefs.

Our removal from Ka‘ūa was with many impediments. There were four cows and hens, and a flock of a dozen goats. A good sized canoe was brought for use in transporting between Honolulu and Pearl River. Among other things were a few cuttings of tree-figs from Kuuapehu, the ends of which were inserted into sweet potatoes to prevent drying. From these proceeded a small grove of fig trees, which afterwards yielded abundant fruit. The mission house was located on the west bank of the Waiawa creek, about one-fourth mile northwest of the present railway station at Pearl City [in Mānā]. There was nearly an acre of ground enclosed in an adobe wall. Some distance seaward was a glebe [parcel of arable land belonging to the church] of a couple of acres of taro swamp, a little below where the railway bridge now crosses the creek. A small cattle pen was enclosed about twenty rods north. An old wall of the natives separated the upland from the planted lands and kept out tōugas and afterward the cattle. Copious springs of most delicious water abounded throughout the district of Ewa, a small one being in our own ground.

Adobes furnished an excellent material for cheap building. The rich soil was very clayey. A species of bunch grass called Makukūi, thickly covered the lower uplands. The dry fibre of its leaves lay in great accumulations of many years’ growth. This very tough fire was gathered in great quantities and trodden by the natives into the wet clay. This fibrous mortar after standing over night, was trodden and moulded into huge bricks to be dried in the sun. So tough was the resulting concretion, that it was nearly impossible to drive a nail into a well-made adobe. I have always fancied that makukūi grass to be worth study as a valuable fibre plant. It has nearly become extinct, being a favorite food of animals. Probably it can still be found in Ewa among the cliffs.

My father’s cows were the first cattle that had ever run on the Ewa uplands. Waiawa valley above us lay knee deep with the richest of grass, where our cows roared. Our goats took to the higher ground, where they flourished, being driven in and penned at night. This flock of goats was suddenly multiplied in a remarkable manner. One day they were found missing, and no trace discovered by any search. A flock of 200 goats had been driven over from Waiālua to Honolulu and our poor little drove of thirty absorbed on the road. The skins of ours were speedily identified in town by a peculiar mark on the ears. The thief was brought before Governor Kekūanao‘a, who sentenced him to make scriptural reparation, namely fourfold. He had to sell a fine horse, buying with the proceeds 10 goats, which he very humbly delivered. An enlarged stockade had to be built for their accommodation. The kids would often stick their noses between the poles, when hungry hogs on the watch would bite off their muzzles.

We made constant use of goat’s milk for the table and cooking. Kid’s flesh was a savory diet. Goat’s mutton was too rank and went to the use of our native servants. Cow’s milk was all reserved for butter, some of which was contributed to our hospitable friends at the capital. The herd gradually multiplied and in a few years became large. Mrs. Bishop, finding herself incapacitated for teaching, finally devoted herself to butter-making, which brought in a good income, relieving the American Board of their support. As the result, the missionary couple when aged, had accumulated enough for their own support, and left about $7,500 apiece to their two children. A third of this, however, grew from avails of city lots in Rochester, N.Y., originally a piece of primeval forest inherited by Mrs. Bishop. As missionaries went forty years ago, these old people were counted among the “rich missionaries” who had “robbed the poor Hawaiians.”
I was in Ewa three and a half years being then sent “home” to the States, after
the custom of missionaries’ children. During that time I witnessed a constant
and arduous devotion of my parents to spiritual and educational labor for the
native people. My father’s parish was a large one, extending from Salt Lake to
Kaena Point, including the districts of Ewa and Wai'anae, with a population of
seven or eight thousand, and, exclusively Hawaiians. Owing to their contiguity to a
large sea-port, the moral condition of the people was more corrupt than at Kailua.
In Ewa a considerable body of hopeful Christians had been gathered
into the Church. Most of the people gave a friendly attention to religious
teaching. The proprietary chief of Ewa was the pious Premier Kinau, whose
influence secured the general adherence of the people to the missionary. It was
otherwise in Wai‘anae, whose proprietary chief was Liliha, or “madam Boki,”
who had long been hostile to the Protestant missionaries. The Wai‘anae people
were accordingly averse.

We had a most excellent near neighbor in Kanepaiki, the old head man, or
Konoiki of Ewa, for whom I formed a decided affection. He was very efficient
in completing the unfinished church, and in building a large adobe school-
house, not far from the present District school. In a year or two, a very
competent teacher came from Lahainaluna Seminary, a fine-looking native,
named Hoolumamanu. He grew to be high in the King’s favor, and became a
“Hukumau,” or Member of the King’s personal staff. Here and there, in the
vicinity, lived native men or women of a class above the common
maakaananas; although hardly chiefs, yet in possession of such “lile” of land as
to enable them to keep a few dependents. Of such was a kind old Deborah, who
had a very large horse, always at our service when needed for a trip to town.
Throughout the district of Ewa the common people were generally well fed.
Owing to the decay of population, great breadths of taro marsh had fallen into
disuse, and there was a surplus of soil and water for raising food.

The dwellings of the common natives, I think, were in poorer condition than
those in Kailua. Doubtless the moister climate caused more decay of the thatch.
The people were also probably more drunken and dissolute. As in Kailua there
was no dwelling of a native not of the old Hawaiian style. Three miles west at
Waipahu, stood a partially framed house, occupied by Mr. Thomas Hunt. The
clothing of the common people was mostly in the old native costume. A few
more men were cotton shirts when out on a week-day, and now and then legs
were encased in pants when at church. No beasts of burden were in use. All
burdens were carried on the old native yoke or mamaka, just as Chinese now
carry them in the streets of Honolulu. As in Kailua, numbers of lean swine hung
around the outskirts of the villages. Occasionally a cow was kept as a source of
Owing no land, and dependent on the caprice of their superiors, the common
people were shiftless and indolent, living from hand to mouth.

Money wages for labor were nearly unknown. Perhaps along the wharves in
Honolulu, laborers might earn a real or hapaulea a day. Domestic servants or
huahus were glad to be employed for their keep. It needed quite a number of
them to perform the work of a small household. Expenses were light. In the
later thirties, the missionaries began to be paid regular stipends of $400 for
each couple, and a small addition for each child. This was found to be
comparative opulence, with our very plain way of living. Our servants
cultivated the little glebe, and so fed us and themselves. Pigpen, cow pen and
goat pen contributed, with broods of fowls and turkeys. Supplies of bananas,
sugar cane, melons, squashes and other eatables were bought for books, slates,
etc. A very common article was pia, or arrowroot, which came in the form of
balls in a dirty condition, imperfectly separated from the fibre of the tubers.
This we would wash and strain, leaving the snow-white sediment to be dried in
the sun. Pia was a favorite diet with the little mission children in Honolulu, and
probably wholesome. I had a special aversion for it, owing to an unhappy
infantile experience. It was with a distressing loathing that I used to see the
little tots gorging themselves on their home steps with the brown jelly in their
tin cups. It was colored with molasses. But those little Clarks and Judd’s all
 grew up healthy. A chief use of pia was for starching clothes. To separate the
starch from the potato-like tubers required only grating, straining and
washing. The tubers grew wild probably an imported plant, with an arrow-
shaped leaf.

Our family made repeated trips to the home of Rev. John S. Emerson at Wai'alua
during those years. There was then no road save a foot path across the
generally smooth upland. We forded the streams. Beyond Kipapa gulch the
upland was dotted with occasional groves of Koa trees. On the high plains the
tin plant abounded, often the view. Cattle then existed to destroy its succulent foliage, according to the statements of the natives, a forest formerly covered the whole of the then nearly naked plains. It was
burned off by the natives in search of sandalwood, which they detected by its
odor when burning. There were no bridges in Wai‘alua. I think we crossed the
creeks in canoes, swimming the horses. The Emersons were living in the then
new stone house, which is still standing, much dilapidated. The wooden upper
story was added later. At one time I spent several weeks there very pleasantly
with my mother. Both Mr. and Mrs. E were very kind. Mr. Emerson heard my
Virgil lessons, and indoctured me into the mystery of scanning hexameters. He
was an apt teacher.

The only disagreeable thing I remember was a certain monotony of diet at
supper, which consisted chiefly of pai-ai and molasses. Mr. E made his own
molasses, grinding a few bundles of cane in a little wooden mill turned by oxen,
and boiling down the juice of the waist of the village, or well. The syrup was so thick
as to run with difficulty from the bottle, and extremely sweet. All our molasses
at Ewa was supplied by Mr. Emerson. On one occasion the missionary took his
ox-cart, and with several natives, we went some distance along the beach to
the northward, where we broke out and loaded the cart with a quantity of large
blocks of creamy sandstone, from 1 to 15 inches thick. It was found beneath
the sand in the water, and was in so soft a condition as to be cut like cheese. After a few day's exposure, it petrified to great hardness, just as lime mortar does by carbonation in the air. After getting it to the house, all hands went to work to hollow and shape the blocks into conical drip stones. I was furnished with mallet and gouge, and hollowed out a passable drip stone not very well proportioned. Such stones were much used for filtering and cooling water in those days.

Our journeys to Honolulu were infrequent, at first by canoe, but latterly on horseback, my father having become the possessor of a horse or two. The road was only the native trail, winding up the various paths on the way. There were no bridges in these islands until after 1840. We emerged from Moanalua valley a quarter mile above the present road, fording the fish pond beyond Iwikei, and wading through the mud flats near the present Railway wharves. Every two or three months, Mr. Emerson would call at our house on his way to town. Rev. Lowell Smith was also a frequent guest, loving to visit his old parish, and helping to inspire the people in spiritual things. He was an alert and genial missionary, very single-minded and full of zeal. In riding, he always wore a thin black claw-hammer coat, with the skirts carefully pinned forward to keep them from contact with the back of the horse. Those old Ewa missionaries would have marvelled could they have had a vision of present conditions, with swift railway trains sweeping through the country, vast cane fields intersected by rail-tracks and huge irrigation pipes climbing the uplands from the immense stream pumps. My father, who died in 1872, never saw a railway, nor even a large steamer. During half a century his only trip abroad was on a missionary errand to the Marquesas.

The lochs or lagoons of Pearl River were not then as shoal as now. The subsequent occupation of the uplands by cattle denuded the country of herbage, and caused vast quantities of earth to be washed down by storms into the lagoons, shoaling the water for a long distance seaward. No doubt the area of deep water and anchorage has been greatly diminished. In the thirties, the small pearl oyster was quite abundant, and common on our table. Small pearls were frequently found in them. No doubt the copious inflow of fresh water favored their presence. I think they have become almost entirely extinct, drowned out by the mud. There was also at Pearl River a handsome speckled clam, of delicate flavor, which contained milk white pearls of exquisite luster, and perfectly spherical. I think that clam is still found in the Ewa lochs.

But the greatest change in Ewa is in the almost extinction of the native population. Some 4,000 Asiatic laborers have taken their places, and few Hawaiians are to be seen. The few who remain have abundant means, renting their lands to the industrious Chinese. The greatest destruction of Hawaiian population took place in the summer of 1853, by an invasion of small-pox. This broke out in Honolulu. Rev. A. Bishop immediately procured a supply of vaccine matter, which proved to be spurious. He then proceeded to inoculate the people with small-pox, thus saving hundreds of lives, and himself coming down with varioloid, having formerly been vaccinated. But more than half the population of Ewa perished in a few weeks. The earliest cases were pathetic. A young woman in Kalauw was visiting in Honolulu, and contracted the malady. She hastened home in terror and summoned her friends and kindred from all the villages of Ewa to bid her farewell. They all came and kissed her, then returned to their homes and all died. The young woman herself recovered.

The population of the other islands were nearly all saved by means of thorough vaccination before the pestilence had time to spread, although about 80 died at Lahaina before they could be protected. I was then living there. At that time no one had thought of objecting to vaccination.

5.1.7 United States Exploring Expedition Investigates “Pearl River” (1840-1841)

In the period between 1840 and 1841, Commander Charles Wilkes of the United States Exploring Expedition toured the Hawaiian Islands (Wilkes 1845, Vol. IV; reprint 1970). During the month of July 1840, Wilkes and other members of his party toured the Kona and Ewa Districts on O‘ahu. Notes compiled by Wilkes from the various exploration trips made provide readers descriptions of the Ewa–Pearl River region and provided background for further investigation on U.S. Acquisition of Pearl Harbor. Wilkes also described cultivation of the land in the region, the abundant flow of water from springs and streams, use of fishponds, the occurrence of the native oysters, and various marine resources. Wilkes also observed that the bays could accommodate a number of ships.

[Traveling in the company of Reverend J. Emerson, Wilkes reported that his men departed from Waialua, crossed Wai‘amea uka and]... proceeded on their way to Honolulu, across the plain between the two ranges of mountains. This plain, in the rainy season, affords abundance of food for cattle in three or four kinds of grasses, and is, as I have before remarked, susceptible of extensive cultivation by irrigation from the several streams that traverse it. The largest of the streams is the Ewa. Scraggy bushes of sandalwood and other shrubs are now scattered over a soil fit for the cultivation of sugar-cane and indigo. [page 79]

At [Waiau] Ewa they were kindly received by the Reverend Mr. Bishop and lady, who have charge of the station. The district of Ewa commences about seven miles to the west of Honolulu, and extends twenty miles along the south shore, or from the hill in the vicinity of the Salt Lake to beyond Laekea or Barber’s Point. There are no chiefs for any persons of distinction residing in the district; the people are labourers or Kanakas, and the landholders reside near the king at Lahaina, or at Honolulu. The taxes and occasional levies without any outlay have hitherto kept them poor.

In this district is a large inlet of the sea, into which the river Ewa empties; at
5.1.8 Road Development in the ‘Ewa District (1858 & 1859)

In traditional times, ala hele and ala loa (trails and major thoroughfares) were accessed by foot. The arrival of Westerners and introduction of hooved animals led to developing new modes of travel and transporting goods. By 1847, King Kamehameha III enacted the laws of the Alani Aupuni (Kingdom/Government Roads). Many of these Alani Aupuni were laid over the ancient system of trails. Only in instances when a more direct route could be developed (say by installing a bridge), were the early government roads realigned from the original trails. Throughout the 1800s many trails fell from use because of the steady decline in the native population, changes in land use practices—the blocking of maauka-nakai accesses as large ranching and plantation interests developed, and the consolidation of population centers evolved. Several native traditions and early historical accounts cited earlier in this study provide details of the routes traveled through ‘Ewa. Reports from 1858 and 1859 provide notes on changes to the trails and government roads passing through the ‘Ewa District.

The Polynesian Roads on Oahu.

June 20, 1858 (page 2)

...Kipapa gulch needs to be paved, an operation that calls for labor only, for the stones are ready to hand. But the people will not consent to go so far to work, unless they are housed and fed. Waikiki bridge has been repaired, and the hill at Kalua (who does not remember it as it used to be?) has been so paved that we may consider it good for years to come.

Between Ewa and Ka‘ili a great deal of labor had been expended; in some places the road has been raised three feet, but nowhere to our mind has so much been done to ease the traveler as at Moanalua, where those rocky points over which the horses has to scramble, have been leveled off to the depth of several feet, and the road widened. At A‘ena a good and substantial bridge has been constructed. The streets of Honolulu have had more or less done to them....

In 1859, another article provided a review of the government road system of O‘ahu, with descriptions of the pass-through gulch at Waiala.

Ka Hae Hawaii
He Kaapuni
5.1.10 Mele Makena, Kanikau Uweluhu - Recounting Travel to Storied Places in 'Ewa with a Departed Loved One

Among the rich writings of Hawaiians are a class of mele known as makena, uwē helu, and kanikau (chants of lamentation and recounting the lives and experiences of loved ones). These remembrances are often filled with names of storied places, likening the beauty and attributes of the landscape with those of the departed, or how the departed traveled the land with companions and celebrated the resources of the living environment—all of which the departed shall never do again. The mele cited in this section of the study identify wahi pana at various locations in the island and the excerpts focus on those of the 'Ewa District.

On August 27, 1862, Albert Edward Kauikoalou Leioopaapakamehameha died. He was the son of Alexander Liholiho (King Kamehameha IV) and Queen Emma. Both the king and queen held ahupua'a lands in 'Ewa, notably one-half of the ahupua'a of Hālawa and one-half of Moku 'umē'ume (or Ford's Island). Queen Emma composed many mele, among them is "He Kanikau na Emalani" for her beloved son.

5.1.11 Mele Makena, Kanikau Uweluhu

The spirit passing in the twilight
Going to the shore of Kūpaka [along the shore of Pu'ula in Honolulu]
Hiding amid the noni leaves of Kape'a [an arid, peopleless plain where spirits roam in Honolulu]
Stringing the blossoms of the 'ōhā tree
That he and Kaiona may both be adorned
The woman who appears in the green
Reedling the voice of the bird
Beckoning 'O'o at Kānehili [an open plain area connected with Kape'a]
The response of the gods sounds
Adorned with kupukupu fern at Kānehoa [* an area on the upland slopes of Honolulu]
Resting in comfort at Puanēnē [*]
Traversing the plains of Lihume [*]
You are the one atop Ka'a'ala...

Another mele composed in 1864 at the passing of Kekalaloaloa shares aoha for the departed and those places which shall never again see or traveled in the company of Kekalaloaloa.

Ka Nupena Kuokoa
He inoa no Kekalaloaloa (A name chant for Kekalaloaloa).

June 4, 1864 (aoao 1)  June 4, 1864 (page 1)

...Pau makekake ia Laie,
A o pi i Nāulewa i ka makanani...
There is no desire for Lā'i e,
or to be close to Nāulewa in the
...Koikele i ka papa auwae o Makaaho,
Opai na kuli o Nanakuli i ka makani,
I ka uhene honeia e ke kaha o Waimanalo,
Ke nei aela me na wahine o ka mao i Puuokapeloi,
Ahoe hana a ke kula o Hoaææ,
I ka lawe maliea e ka wai o Wai'pahu,
Heaha la ka makani he Waikoloa,
Eapa nei i ke kula o Punahiwalele,
I ka milimili a kaa milii e ka wai o Kamii,
I milia mai e Manana noho Weloaka i kalai,
Lea ka apaapa i ke kula o ka Wai'kula,
Ke nana ia luna o Kaehaææ,
O ka maikai o ke kula e waho nei,
Ua pahie a nolu wale i ke pili...
...O ka hoi no o maa a pili me kuu aloha-e,
Aloha oe o Kekamalahaohe he inoa.
[signed] L.

breeze...
The knees of Nānākuli tremble in the wind,
Murmuring along the coastal plains of Waimanalo,
Moving about with the women in the ma‘o growth at Pu‘u o Kapolei,
There is nothing to be done on the plains of Hō‘aeaæ
The water of Waipahu is tenderly taken,

What is it to the Waikoloa wind,
Waiting upon the plain of Punahiwalele,
Caressed and fondled by the waters of Kamii,
Caressed at Manana, dwelling peacefully at Weloakā
Joyfully dawdling on the plain of Wai'alka
Looking to the heights of Kā'ehaææ, The find plain which is set there before us,
Simply sliding and swaying on the pili
...Let us two return to be with my love—
Love to you – Kamalahaohe is your name.

5.1.11 A Journey Across 'Ewa (1868)

In 1868, The Pacific Commercial Advertiser published the article below filled with details of a journey from Honolulu through the district of 'Ewa. The unidentified author described some of the traditional and historic features observed along the way and offered their opinions on the value of the land for development of agricultural endeavors.

The Pacific Commercial Advertiser
Kaaia Mountains, January 1868.
Ride to Ewa.

January 18, 1868 (page 1)

...We galloped out of King Street on the excellent road that leads in the direction of Ewa. This is decidedly the best highway leading from Honolulu, as far as the Kā'īhi bridge. It is macadamized with coral, broad, graded, convex enough for the water to flow to either side, and is compact and durable...

Beyond Kā'īhi, the cactus and yellow-flowered mimosa, which filled the air with its delicious fragrance... Descending a hill which was the terminus of an ancient volcanic wave of tufa, we ender the romantic valley of Moana'uka. The bright waters were murmuring over a pebbly bed between green and fertile banks, where there were some evidences of cultivation. Our road wound up the valley for some distance, past substantial farm-houses, quietly nestled between hills, where we left the valley meandering away with Arcadian beauty among the green wooded mountains to the right and ascended the volcanic ridge. On the summit of the ridge to the left were several piles of stone rising like rude obelisks, that were surrounded with superstitious traditions of the past. There marks the descent, the jumping of place, to Kapapakolea, or the inland regions of Oahu. We rode to the summit of the ridge below the weird piles and stood on the sheer brink of a precipice that overlooked the Hawaiian Lake Avunus.

[Ala'amanu] Far below, having the base of the dark volcanic cliff, in the cavern of an extinct crater, a gloomy lake was sleeping in a green meadow pastured by cattle... As a dark cloud swept over the scene, it gave it that impress of awe and grandeur that created in the Hawaiian mind the idea of its being the place of descent to the regions of the dead. One of the native legends bears... An enamored youth in ages long past, lost the lady of his love, and he determined to seek her among the shadows of the dead. He made the descent, found the share of his beloved... by trick he outwitted Milu, the prince of the realm of darkness, and returned to the upper world with her spirit, which was restored to her body and the lived a life of bliss in the Eden of the islands. The Hawaiian idea of the immortality of the soul, before the intercourse with the Europeans, was more brilliant and spiritual than that of the Jews, and most of the civilized nations of antiquity...

The Hawaiian Avunus is a fresh water lake; but beyond it to the south-east, also in the crater of an extinct volcano, nearer the sea, is a larger lake of salt water, called Kealia, [Ala'apakai] which it is said rises and falls with the tide, showing a subterranean oceanic connection. The view above these lakes from the ridge is beautiful, extending over mountain, vale and ocean. Away to the west and north-west extended the green undulating and wide plain of Ewa, bounded by the Kaaia or Waianae range of mountains, over which was spread a gossamer veil of clouds, which gave a softened quality to the scene, and contrasted the brighter emerald of the grassy glades with the deeper variegated green of the wood-lands. The bright bay of Ewa, or Pearl River, lay before us, spread around its verdant islands, extending deep into the plain, and affording excellent inland navigation for miles. What a magnificent site for a city—a commercial emporium of the Pacific—on its shores!
The narrow entrance that leads into the bay is shallow, but the coral bar is short, and can be dredged and deepened at no considerable expense so as to admit the largest vessels. When once inside, the harbor is land-locked, secure and capacious enough to furnish anchorage for all the ships engage in the commerce of the Pacific. There is not only one, but many harbors and anchorages. The purest spring water gushes in abundance from the bold shores, and two limpid, never-failing streams from the mountains pour their bright waters into the bay. Then there are the Waiawa and Waileke, furnishing water enough to supply the largest metropolis...

We descended the ridge rapidly, passed the ravine of Hālawa, and over an elevated table land into the bright fairy-like valley of Waimalu, where a Roman catholic church and the sugar mill and plantation of Mr. Williams are situated [at Wahioka]. On over the table land we galloped, descended into another valley where a bright stream was winding its way, and some neat cottages and hale pilis appeared to the right and left of the road, with some evidence of cultivation around. The sugar plantation of Mr. McColgan was passed to the left of the road. It is immediately on the margin of the bay, where several large springs gush out of the bluff near the sugar mill. We paused not but continued on to where two cyclopean rocks formed a gate-way leading to the left of the road, where a few rods ride brought us to the hospitable residence of Victor, near the murmering shores of the bay. We were cordially received, enjoyed his hospitality in the form a most excellent roast beef, fresh butter, the best French bread and cool spring water...

The neighborhood appeared populous, several respectable cottages and farm-houses were around, and it had the appearance of a village. There was much evidence of cultivation. We saw corn and beans flourishing as finely as in any of the States of the West, and we do not know why cotton would not do as well... No irrigation is resorted to for cultivating the corn and beans. They derive sufficient moisture from the soil and atmosphere, and where these products grow, cotton will generally succeed. We passed the cattle ranch of Messrs. Bernard & Raymond [Māna], and by the local District Judges', over fine lands, and forded the bright dashing waters of the Waiawa, a perennial mountain stream that waters a beautiful and well cultivated valley.

We rode slowly on the valley over the plain for the purpose of admiring the excellent corn and cotton lands which lie between this stream and Waikele. There are several thousand acres lying waste and idle, that could be made to produce and annual income of thousands of dollars. Why is this? And why such a waste of the produce and knowledge of the agricultural interests of the Island? We passed by the old residence of the late Wm. Hunt [in the ‘Il of Pāpā] on a conspicuous elevation, saw two beautiful springs that gushed out of the cliff in waterfalls, crossed the Waikele Bridge and the narrow valley of the stream, where many deserted taro patches appeared, and the coconut palms seemed to droop over the desolation around.

We ascended the bluff beyond by a hedge of Mexican-like cactus and were attracted to a mound on the left that appeared like a miniature Cholula. We rode upon its summit and enjoyed the view. It is one of the most beautiful and rural in the islands. Although thirteen miles distant, Ho'olului appeared almost at our feet; every outline of the coast, plain and mountain was distinct and clear; the rolling, green plain of Ewa between the grand ridges of mountains, the windings of the bright bay and the great blue sea, with several sails in the distance, completed a scene of beauty.

But a short ride by a long a new stone wall brought us to Hōaeae, then to the cattle station of James Robinson, Esq., where we were kindly welcomed by his mayordomo, or head man, Mr. Patrick Curran... He kindly welcomed us, gave us the best of cheer; and ascertaining that we wished to ride the mountains, prepared to furnish us with fresh horses... We had a few glorious showers in the evening, but when these passed away, the setting sun spread gloriously through the hazy clouds, and we walked down to the shores of the bay. On either hand were evidences of former populations, in deserted and dried up taro patches, the foundations of ruined buildings, piles of shelves near them, like those of the pre-historic races on the shore of the Baltic, and over all, the ancient and decaying cocoa palms appeared like melancholy monuments, dropping over this scene of desolation. We were informed that before the year of the small-pox in 1853, there were twenty-five native houses in the little valley between Patrick's residence and the bay. Now there are none—a sad evidence of the withering away of the native population...

[The party met an elder foreign resident near the shore of Hō‘ā‘ae, and returning inland, it was reported:] Wandering over the light soil of the upland, which is full of sunken pits, we found among the ruins of the old native houses a kukui candle-stick, or lamp-stand, well made of bark and polished. We bore it the house for the benefit of Patrick’s cabinet of curiosities...

[Rising the next morning and traveling the uplands of Honolulu, it was reported:] Thousands of acres of the best cotton lands extended on either hand, and few wandering cattle seemed all the enjoyed any profit from it. We crossed several deep ravinies in the ascending plain and came to the green moulded foot hills where the wililili and kukui trees first made their appearance in the ravines. We ascended the grassy foot hills by winding cattle paths, and when we arrived the region of the koa, we discovered a flock of about sixty turkeys in a glade... The koa forest was young and low... Higher up the mountain we discovered signs of wild hogs, and on a lofty ridge in the midst of a koa forest we came upon a “bee tree,” in the form of a hollow koa that had been blown down by some wrathful tempest, but was yet green and flourishing...

The scenery as we ascended the mountain benches opened out grandly. From the summit of the loftiest ridge of Kaʻua mountain more than half of Oahu can...
be taken in at a glance; eastward beyond Diamond Head; northward to the summit of the eastern mountains; the plain of Ewa, from wave to wave and mountain to mountain... We have never witnessed a more lovely place than that of Ewa and the peninsular plain that extends along the sea form the southeastern terminus of the Kaala mountains to the Salt Works at Ewa bay...

5.1.12 The Catholic Church at Hālawa Destroyed by Fire

The Pacific Commercial Advertiser

Church Burned.

October 28, 1871 (page 3)

The fine Catholic Church building at Hālawa, some eight miles from this city, was accidentally burned to the ground several weeks ago, but the good people of Hālawa were for some unexplained reason so reticent about it, that scarcely any one heard of the fire until recently. The church was known as St. Patrick’s, and was one of the largest and finest of the country churches on this island. It will be rebuilt.

5.1.13 Travel through the ‘Ewa District (1873)

The Hawaiian Gazette

On Foot Around Oahu.

August 13, 1873 (page 2)

Partly for novelty, partly for exercise, and partly for that enjoyment of hill and dale scenery which is most completely obtained by a traveler on foot, one small company packed up tents and provisions for the Oahu tour. The first day...

Considerable interest was expressed by the early birds of Honolulu at the sight of four rational individuals attempting to make any journey on foot, especially as two of the parties were ladies. Keoni seemed to be regarded as decidedly the most respectable feature of the whole affair, as he had a rather good mount and let the column.

In Palama we were overtaken by a carriage from Honolulu which brought the latest tidings as to the prospects of annexation, the state of public sentiment, etc., and then we pushed off alone. The first halt was made in the lovely amphitheater of Moanalua, a valley apparently rent by earthquake out of the overhanging hills, and now a jungle of acacias and wild convolvulus. Rising out of this brake the party marched for some miles through a landscape of red dust, at occasional intervals obtaining a glimpse of Pearl River, pleasant memorial of departed picnics. A halt, sounded by the general who was ahead, caused a closing up of the whole line, which was at present scattered on the road; and observations were taken of a sloop lying in the bay. Careful reconniter having ascertained the existence of no hostile forces ashore, and the sloop, at first supposed to be possibly that of a Chinese or Fijian annexing admiral, being recognized by Keoni as the “Waimahu” of Honolulu, rations were served out, and the column moved on. Ewa was reached about three in the afternoon, and an advantageous camping-ground secured on land north of the stream, the property of a good-natured and portly old lady. Her husband tried to assert a leading interest in the ownership of this territory, but our general logically silenced his claims by reciting extracts from recent debates upon woman’s rights; he acknowledged the justice of his wife’s action, and the packs were unloaded. Half a minute’s measuring out of space, “up poles,” “up canvas,” and “drive pegs,” and the tents were pitched almost before the wondering population had ceased rubbing their eyes. The first bathing party having been told off, with one smoke per man, the second or non-smoking party succeeded it, the first meanwhile lighting fire and preparing dinner. Pigs and poi-dogs appeared to be the principal supplies obtainable but they were not appropriated by the quarter-master, who pitched at once into the commissariat stores. The menu was as follows: soup of oysters; bread, with (melted) butter; bacon, fried a la commandant, with kalo and uala maoli; sardines, and cocoa. Then the party read, and sketched, and watched the twilight darkening on the upland plains of Ewa, whilst the Waianae hills still shone with their crimson crest of sunset. The adjutant is uncharitably said to have gone to sleep and talked somnolent poetry, but he protests against the charge. He only remembers quoting a stanza which was printed some time since in The Friend about “Waianae.”

The butter, “cause of much solicitude,” was put into the stream to resolidify, and as night spread her pinions o’er the scene, upwards of 100,000 mosquitoes arose with shrieks and howls.

Very early indeed the next morning we, or rather what was left of us, folded our tent like the drab or some other felath, and as silently fled away. No well-regulated tourist will henceforth visit Ewa without a mosquito net and some cotton-wool for his ears.

We had a fine morning march over the rolling upland and obtained a complete panoramic view of the Kona of Oahu, from Diamond Head to Pearl River. The general moralized a good deal upon politics; “certainly” said he “the establishment of barrack and hospital and grog shop on the shores of yon pretty bay will not improve the scenery, whatever may be its effect on the solitary fishers whose canoes dot the still water.” Discussion ensued, in which everyone maintained an entirely distinct opinion when the tent poles, which had shifted position somehow, hit the black horse hard upon the head, and he swerved from the path, throwing the line into confusion. They were fastened back, and we dipped into the long, hot, stony gully of Kipapa. Here a herd of enquiring cattle, apparently distrustful of foot-passengers, bolted straight down the hill-side, as the best thing to do under the circumstances. On the next
ridge we said good-bye to the scenery of yesterday's march. Nuuanu, Moanalua, Kaliakaua, Waimah and Ewa, and shortly the tents were again pitched in the picturesque ravine of Kaulānālua, with a noble rivet flowing at our feet, this time toward the north, as we had passed the watershed. The encampment looked very pretty; a turn of the ravine hid the road and bridge from view, and on our side of the stream a gentle lawn sloped from the rocks to the stream, while the more precipitous bank opposite was covered with clumps of trees, fern-brakes and bright flowering shrubs.

The preparation and consideration of a good supper, in style somewhat similar to that of the preceding day, afforded occupation for the remaining hours of daylight; and while most of the party, under guise of reading, dropped off into various quiet dreams, the adjutant sauntered alone by the waters' side. Night fell quickly in this walled ravine and the idea of solitude was perfect; no living creature moved; the only sound upon the evening air was the endless low murmur of the stream, and the chirping of some convivial grasshoppers. The glimmering lights of the far off tents began to twinkle against the dark hillside and as the saunterer retraced his steps he thought of Wordsworth's lines...

5.1.14 A Royal Visit Around O'ahu and Visit to 'Aiea (1874)

On February 3, 1874, King William Charles Lunalilo died (after little more than one year as monarch), leaving no heir. David La'amea Kamanakapu Mahinulani Nā'aieiahukalani Lumialii Kalākaua announced his candidacy on February 4 and dowager Queen Emma Kalākaua announced her candidacy on February 5. A heated period of campaigning took place; when the votes were tallied on February 12, 1874, David Kalākaua was proclaimed king. A riot ensued and was quelled with the help of American and British troops. In the end, Queen Emma addressed the new king and her people calling for peace (Kuykendall, 1967:8-14). Following the initial difficulties, King Kalākaua, along with Queen Kapi'olani, family members, counselors and a large group of attendants, traveled across the island to meet with the people and hear from them on their needs and hopes for the Kingdom. On April 29, 1874, The Hawaiian Gazette published an account of the King's visit to O'ahu and passing through 'Ewa, with mention of 'Aiea and a visit to the home of Dr. McGrew.

The Hawaiian Gazette
The Royal Progress Through the Hawaiian Kingdom.

April 29, 1874 (page 2)

Soon after the election of His Majesty King Kalākaua, it was very wisely determined by him to make a tour of the islands, in order that might become more intimate acquainted with his people and confer with them regarding such measures as ought to be adopted by the government, as likely to promote the prosperity of the people on each island. To this was no doubt added a desire to remove, by personal acquaintances, any want to confidence in him that might exist in the minds of the people, whether foreigners are natives. To complete this tour during the few weeks which intervened between his election and the assembling of the Legislature for its regular biennial sessions, would require short visits in each district. But his Majesty, being a practical man, planned the details, and has well executed them.

A short account of the manner in which Their Majesties have been received in the different island of the group will doubtless interest the foreign readers of the Gazette...

Around O'ahu.
Early on Monday morning, the 19th, the King and Queen set out on their tour around O'ahu—this having very properly been left till the last. They left the Palace before six o'clock and road out past the telegraph station to Mr. Pico's, where they took breakfast... [through Maunalua, to Waimānalo and around Windward O'ahu. Then departing from Wai'āhu.]

On Friday morning [April 23] the party started homeward bound via Ewa, where they spent the night, His Majesty again addressing the people. Prince Lēleiohoku with an escort of some twenty on horseback, arrived here to join in the meeting, and after the King had spoken, the Prince made a very neat address, which surprised everyone, it being his first appearance as a public speaker. His Majesty remarked that he should have to take care of his own laurels, or his Heir apparent would become the chief orator.

Leaving Ewa about noon, the royal party proceeded on towards Honolulu, stopping for an hour or two at Aiea, the country villa of Dr. J.S. McGrew, where the Doctor and his wife were on hand to received their Majesties, and entertained them to a lunch. It is just six mile from Honolulu, and forms a very pretty country residence. About three o'clock the party remounted and road on, and as they reached Moanalua they were met by the Hawaiian Galvay, which had gone out to escort them in.

Here the party formed into four divisions, first the Galvay, then the Prince's escort, then the Governor's, and lastly their Majesties, followed by their retainers. In this order they rode into the city, and presented a very fine appearance, there being in the cavalcade some two hundred persons, mostly dressed in white hats, red shirts or waists, and black pants or bloomers. In passing through the city the streets were line with people, who cheered the King and Queen, as they road along, and returned to the Palace...

5.1.15 A Greatly Loved One has Died (Noted Places of the 'Ewa District Cited in Mele) (1876)

A lamentation for Mrs. Heneri Haiakeawe celebrating wahi pana visited by her in the company of her husband. Excerpts from the mele also include reference to one of the poetic
Ka Nupepa Kuokoa
Make i aloha nui ia.

Malaki 25, 1876 (aoao 1)
Kuu wahine mai ke one kulima o Ewa,
Ma i ka kei wava nehe i ka poli o Lihue,
He ula pu mai luna a hiki i na wawae,
Kuu wahine mai ka wai hui o Waieke,
Me ka kepo hono o Honouliuli,
A me ke koekoe o ka po ke hele ia,
Me ka pakikakika pahee o ke akakaia,
Ul a makanani ka ia i kina pau lua o kuu wahine,
5.1.17 An Itinerary of the Hawaiian Islands with A Description of the Principal Towns and Places of Interest (1880)

George Bowser, compiler and editor of “The Hawaiian Kingdom Statistical and Commercial Directory and Tourists Guide” (1880) documented various statistics and places of interest throughout the Hawaiian Islands. The following excerpts from Bowser’s publication provide readers with descriptions of travel through the ‘Ewa District, including descriptions of the landscape, communities, and growing business interests in the region.

By the time of Bowser’s publication, James Campbell’s Honolulu Ranch was fully operational; an agricultural well had been tapped in 1879, proving that water could be developed on the arid lands. Kalo lands were planted in rice across the district. James Campbell, James Dowsett, J.R. Williams, James Robinson, and Samuel C. Allen were among those who were developing extensive ranching operations on fee-simple and leasehold lands. Entering the ‘Ewa District from Waianae, Bowser reported:

...My next halting place after leaving Nanakuli, was at Honolulu, at Mr. James Campbell’s. This gentleman owns, also, the Kahuku ranch, on the extreme north point of the Island, of which I have already spoken. The Honolulu ranch is an extensive property. The main road runs through it for about twelve miles, and the general breadth is seldom less than four miles. The surveyed area is 43,250 acres. One large tract of this land is perfectly level, with the exception of a few acres near the centre, where there is a knoll of rising ground.

From Mr. Campbell’s veranda, looking eastward, you have one of the most splendid sights imaginable. Below the house there are two lochs, or lagoons, covered with water fowl, and celebrated for their plentiful supply of fish, chiefly mullet. In the far distance, some twenty miles away, you can see the range of mountains which form the backbone of the island. It was on the northeastern side of the mountains that the earlier part of my ride was taken. The chain runs from Mr. Campbell’s place at Kahuku, away to the easternmost point of the island. The soil at Honolulu is good, and, with the aid of irrigation, will grow anything. In the meantime, it is wholly pasture land, but the means of irrigation have recently been secured by Mr. Campbell, who has sunk an artesian well to the depth of 273 feet. This well has delivered a continuous stream of water equal to 2,400 gallons per hour, ever since the supply from which the present flow comes, was struck on the 22nd of September, 1879. Besides Mr. Campbell’s residence, which is pleasantly situated and surrounded with ornamental and shade trees, there are at Honolulu two churches and a school house, with a little village of native huts.

Leaving Mr. Campbell’s, I came next at Waipio, at which place resides Mr. W. G. Needham, the District judge for the districts of Ewa and Waianae. Here, also, is his courthouse, and near it a considerable village. The neighborhood is celebrated for its fish-ponds and rice plantations which extend for many miles around the Lochs through which the stream—best known under its English name as the Pearl River—finds its way to the sea. At Waipio itself there are five rice plantations and some valuable fish-ponds. Here at a recent fresher, swelling the mountain streams, did a considerable amount of damage, covering the rice plantations to the extent of three or four feet, and carried out to sea the contents of one fish-pond, causing a loss of five thousand dollars to the lessee. It is estimated that it will take four years to replenish the pond.

At Waipio the road which I have been following joins that which leads directly from Waialua to Honolulu through the heart of the [page 495] Island. That road I did not examine personally, partly from lack of time, but chiefly because the country it runs through contains scarcely any population to speak of, being wholly pasture land, and occupied as such by a very few persons, who are for the most part lessees from the crown. The whole tract is one great valley between the two ranges of hills which form, as it were, the skeleton of Oahu. A large part of it is gently undulating grass-land, but at one or two places the valley narrows to something like a gorge. The road is, I understand, a good one; indeed, for many miles of the way you may choose your own road over the grassy, undulating plain.

The Waipio Ranch is one of the large holdings just spoken of, leased by Messrs. Dowsett & Robinson from its native owner, John II. It comprises 18,000 acres, and is wholly a grazing farm. Following the main road from Waipio to Honolulu, I came first to Waialua, still passing by fish ponds and rice plantations. In this neighborhood is the Waimano Ranch, which Messrs. Allen & Robinson rent as a grazing farm. Here we have a great plain of pasture land
Modern History of the Project Area and its Vicinity

running back to the mountains. The hills beyond this plain are covered with vegetation and are flat-topped, offering good pasture for sheep. The lagoons, or Pearl Lagoons, as they have been named, are here close to the road, which continues to be excellent. These lagoons are teeming with fish, and it is chiefly from them, and from the numerous fish ponds I have spoken of, that the market in Honolulu is supplied.

In some unknown era of the past, the population of the whole island if there had been any, might have been supplied from the banks of this inlet with excellent oysters. There are no oysters to be gathered in any of these islands now. But the remains of them are here in abundance, and it is evident that they have, at some time or other, been all destroyed by some of the freaks of the goddess Pele, the presiding divinity of all that is volcanic in this land of volcanic wonders. As the shells are found in a closed state it is evident that whatever destroyed them did so suddenly. Mere heat, of any degree, will not account as any temperature that would not have more or less calcined the shells would have caused them to open. Perhaps the most likely suggestion, as a solution of the question, is that they were killed by sulphurous vapors, as some of the rebels against the authority of Kamehameha I were in Hawaii. Be this as it may, the phenomenon is a very strange one, and the strangest part of the whole, as it appears to me, is that all traces of oyster life should have been exterminated from every part of the Islands, since it is not easy to believe that this is the only place at which they flourished abundantly in former times. [page 496]

From the Waimano Ranch, for a distance of four miles, the road still runs through a region of rice plantations, taro fields and fish ponds. At Puuolua, seven miles from Honolulu, are the salt works of Mr. James L. Dowsett, which are on a very extensive scale. The inclosure of the salt works measures about 500 acres, and there are over 1,600 acres of pasture attached to the property, the whole of which is Mr. Dowsett’s freehold. A mile further on is the Hālawa Ranch of Messrs. Dowsett & Williams. The pasture here cannot be compared with that to be found at so many of the ranches I have visited during my journey round the island, but that some at least of the soil is as good as elsewhere is proved by the fact that 150 acres of the property have been brought under cultivation with great success. This property contains 10,000 acres.

Two Miles further on, and about four miles from Honolulu, is the Moanalua Valley. The intervening country is of a broken character, full of very deep and romantic ravines. Messrs. Dowsett & Sumner own about 9,500 acres of this land, and notwithstanding its rough character, affords valuable pasturage. Mr. Dowsett has also leased 3,500 acres of adjoining Crown lands, most of which is pasture land. This leasehold goes by the name of the Kauaikui and Kualapalena Dairy Farm. A large tract of land in the Moanalua Valley belongs to Her Highness the Princess Ruth Keelikolani, who is sister to two of the late Chiefs of these Islands. The extensive fish-ponds in the neighborhood are also

the property of Her Highness. Fine views of the sea and of the city of Honolulu can be had from several points on the road between Hālawa and Moanalua.

On the way from Moanalua to town I had to pass the curious Salt Lake which has always been an object of interest to visitors to Honolulu. This lake was of great value to the natives in former times. From this and other sources they procured salt in such quantities that it became an important item of export, and was also largely purchased by the whalers and other traders which viced at the Islands. This lake is wholly separated from the sea by a low range of hills, but the action of the tide on its waters demonstrates an underground connection. The lake is everywhere shallow, except near the center where a deep hole exists, which has, I believe, never been sounded with success. Here, no doubt, is the channel of communication with the sea...

(Bowser, 1880: 495-497)

5.1.18 Environs of Hālawa and the Larger `Ewa District Visited (1883)

The Daily Bulletin
A Country Ride.

March 30, 1883 (page 1)

Probably many of our readers have never been down to Pearl River, and a little description of the place will be interesting to them.

Leaving Honolulu behind us with the What Cheer House, on King street, we first come to Kalihi, having passed over as good a road as there is in the Kingdom. After Kalihi, still traveling on fair road, we come to some rice plantations at Kauaiuki, and then to the overhanging trees at Moanalua. From this point the road is in a much worse condition than the first part.

Leaving Moanalua the road now passes along the side of a high flat-topped hill, and just overhangs a narrow gorge, through which a pebbly mountain stream trickles slowly over its pebbly bed. Little groves of coconuts and bread-fruit encircle the houses and break the monotonous aspect of the hill-side. But although all is beautiful the timid passenger does not enjoy his horse literally clambering up a steep rock right in the pathway, knowing that if he slips or swerves too much to one side both will be dashed in pieces on the rocks below. But native horses are extremely sure-footed and everything is safely passed. After a mile or so of this winding in and out around the side of the hill we come to a spot where an original genius has made a road. He evidently had heard or thought that paving a road with rock was a good way to make it last, and he did so. Unfortunately his knowledge didn’t extend to the fact that the rocks ought to be levelled and placed close together, so that for a few hundred yards you travel over what a cobblestone pavement would be if the cobblestones were from 6 to 18 inches across, with knobs rising in the air and carefully set
from one to three inches apart. As an interesting piece of mosaic or an everlasting monument of the contriver's genius the thing is an unapproachable success, but as a good passable road for traffic the less said about it the better.

After getting over this "ancient Roman pavement" we reach the crest of the hill, and looking down see for the first time the beauties of the Pearl River valley. Far to our right the valley stretches up amongst the ancient purple hills, reeling in their beauteous apparel of peacock greens and morning blues. The misty peaks seem enshrouded in vails of transparent azure samite, which the rays of the sun tinges with all the hues known to painter or poet.

"Fair Dreamland" seems to have its home here, in reality, and we can hardly credit that this is not a vision. Slowly drawing our eyes away from the feast of beauty and loveliness we scan the course of the valley, noting the eccentric shapes of the foot-hills and the lovely carpet of grass which hides everything, even the beds of the winter water courses. Here and there, where the rain has washed off this grassy covering and slipped it gently down into a hollow bed, the naked red of the earth stands out in surprising relief like gouts of blood on a garment of green.

Right before us the road winds itself to the right and left, showing, in all its ferruginous and dusty ochre, a clear border to the heavenly mountains, till it crosses the little bridge at Halawa, and rising over a little hill disappears from sight. (To be continued)

April 3, 1883 (page 1)

To the left hand is Pearl River or Pearl Lochs, as it is as frequently called. Yes! There It is, a calm, clear, placid lagoon, whose shimmering waters lave the shores of the thousand islets, dotting its surface with their varied aspect of hill and plain in miniature, like summer stars besprinkled over the vault of heaven.

Nothing can be more lovely than the panorama now spread before us. It greatly resembles that of the far-famed Bay of Naples on a small scale. And while we would not exactly paraphrase the Italian saying, "Ser Naples, and die," the feeling of intense delight in the wonderful loveliness of the scene leads one to almost give expression to the same wish.

Behind us rises the hill we have passed over, to our right the valley and the everlasting hills, before us the red road crossing the undulating plains, to our left the sea and the island-dotted lagoon and beyond, the cerulean blue of the distant Waianae mountains. The sheen of the sun, the fleecy clouds that flock the sky, the venture of the spring-time foliage and the lazy stillness of the air, intoxicate the senses of the beholder...

5.1.19 A Storm Washes out Bridges in 'Ewa

By 1849, Kamehameha III instituted the Alanui Aupuni (Kingdom Trails and Road System), dedicating funding to improvements and maintenance of the trails and byways. In many instances, the ancient trails were widened, paved or otherwise improved, while at other locations the routes were realigned, and the first Western-style bridges were built across gullies. As commerce grew, with more goods being transported in or out of the district, more improvements were made. The historical record includes many descriptions of road development and issues in maintaining them through flood and use. Here, in 1883, the bridge at Waiau was destroyed while the bridge at Waimalu withstood the freshet. Rice lands below the bridges were destroyed.

The Pacific Commercial Advertiser
News of the Week.

August 18, 1883 (page 5)

...At Honolulu on Tuesday during the thunder storm the lightning ran along
the telephone wires to Mr. James Campbell’s house setting it on fire. It was fortunately extinguished without further injury than the destruction of the telephone instrument. One of the poles which on which the wires are laid that was outside the house was split down from top to bottom...

The Waiawa bridge over the Ewa stream was on Tuesday carried bodily down that stream by the heavy floods and is now lying in a heap, about a mile from the crossing place on the Ewa lagoon.

The freshet was a most remarkable one the water being four feet above the rail of the bridge and two feet higher than any point that has previously been noted by the natives. The volume of water was so heavy and irresistible that it tore the iron work in to shreds. Some of the timbers are washed entirely away but the greater part of the bridge can be utilized again in rebuilding; the larger timbers are mostly unbroken but the bolts are twisted quite out of shape. It was a new and substantial bridge built by Mr. James Hayselden in March last.

The Waimalu bridge in the same district and close by the Waiawa bridge, which was also built by Mr. Hayselden at the same time, was not damaged, though the approaches to it were washed away.

The rice fields in the gulches below the bridges have suffered to some extent from the excessive water flow and in some places must be replanted.

5.1.20 Kāneʻkuaʻana Worshipped in ‘Ewa (1885)

As noted in earlier sections of this study, the natives of ‘Ewa held many beliefs pertaining to the deity of Ke Awaalau or Pu’u‘ula. Among them was the goddess Kāneʻkuaʻana (a mo’o or water spirit), responsible for the near shore estuary fisheries of the region. She protected the pipi, nahawele and various bivalves, along with other fishery resources. Her kapu were observed when gathering the fishes under her protection and heiau waihau were built to honor her and ensure the well-being of the marine resources. In the brief letter below, a writer with the penname Kaiahamaualeo ([The-fish—which—quiets—voices]), taken from an ancient saying of the ‘Ewa District, commemorating Kāneʻkuaʻana’s kapu, reports that some people are once again worshiping her.

Ka Nupepa Kuokoa

“He Leta No Ewa” (Letter from Ewa)

August 8, 1885 (aoao 3)

...Ila ikeia ma ka Nupepa o ka la 18 o kela mahina i hala, no no oale hoolaha e pili ana no na hana hoomanamanana i kaina ma Awa, Ewa. Pehea ia ka hoi i hoolaha ole ia ai ko Manana maa hoomanamanana me he mea aia aia mai wahii na anano o keia ano kahi i hooolu ia ai ai a nui. Aia ka malala ma kea nane e hooolu hou i ka “Pipi,” oia hoi o Kāneʻkuaʻana, oia hoi keia moo kaumana o Ewa.

5.1.21 Royal Visits to the Mānana-Waimano Peninsula

There are several articles published in the papers which describe visits made by all ‘i to estates in the ‘Ewa moku. One such visit to Mānana-Waimano occurred on October 22, 1888 and is described below—

The Daily Bulletin

A Royal Yachting Party.

Stranding of the Steamer Waimanalo — Making Pleasure Out of Misadventure.

October 23, 1889 (page 3)

Honorable W. G. and Mrs. Irwin gave a yachting party yesterday to Pearl River in honor of the Prince and Princess de Bourbon.

The yacht Helene had on board His Majesty the King, the Prince and Princess and their party, Mr. and Mrs. Irwin, and a few others to the number of about twenty in all. The steamer Waimanalo accompanied the yacht with about forty more invited guests. The day was all that could be wished for, and the Helene took the lead, cruising around the lagoon while the Waimanalo, decked with bunting, kept on her wake.

The party landed at Manana point, where a bountiful lunch had been prepared in the algrova grove which fringes the shore, and ample justice was done the feast by the guests.

It was Mr. Irwin’s plan to have landed the party about 1 p. m. opposite Puuola, where carriages were in attendance to convey the party to His Excellency S. M. Damon’s country residence at Moanalua. Mr. Damon was to have entertained the royal guests and yachting party with high tea before they proceeded on to Honolulu. In order to facilitate matters Mr. Irwin transferred all the party to the Waimanalo and the Helene returned to Honolulu, but unfortunately when ready to leave the camping ground the Waimanalo was found to be hard and...
fast on shore, and with a receding tide it was impossible to get her off. After considerable delay the services of a small coasting schooner were secured and later on the steamer Ewa was pressed into service, and by midnight all the guests were safely landed at the point where the carriages were in waiting.

It was unfortunate that a day which opened up so propitiously should end up so differently, and much regret was expressed for Mr. Damon, who had taken so much trouble to add to the pleasure of the day, but the good nature maintained by everyone and the sweet voices of the ladies accompanied by their guitars and "taro patches" [slack key tuning], which made the algeroba groves resound with melody, gave the idea of a prolonged picnic. In fact, Mr. Dillingham, who was one of the party and who was to have brought the guest's home on his railroad from Moanalua, thought that it was an auspicious opening of the O.R.R. Co.'s new hotel site.

Everyone was enthusiastic over the Prince and charming Princess, whose good nature was maintained throughout, and Her Royal Highness expressed herself as rather pleased with this little episode which will impress so vividly on her memory her trip to Hawai'i nei. The gentlemen of the royal party will also be kindly remembered by the ladies who were in the yacht, for the prompt manner with which they came to their rescue in getting them to the shore from the Waimanalo when the tide fell so that the boat could not get to the landing, and Mr. Ned Dowsett also deserves special mention for his energetic efforts.

Altogether the incident was not without its charms and, now that the danger is over, will be pleasantly remembered by all who participated.

Once the Oahu Railway & Land Company (O.R. & L. Co.) engaged in the business of transporting supplies, goods and passengers between 'Ewa and Honolulu, the company began publishing Timetables to facilitate building a rider base. An early example of the timetables was published on December 31, 1889 (page 2) in *The Pacific Commercial Advertiser* (Figure 12). The timetable provides readers with the route and station itinerary from Honolulu to Mānana. By July 1890, the rail service was extended to the 'Ewa Plantation, with the terminus at Honolulu Harbor (*The Pacific Commercial Advertiser*, 1890c:3). At the same time, development of the Mānana-Waimāno lands into what became Pearl City was underway, setting the foundation for a new population center in the 'Ewa District. By 1895, the railway ran all the way to Wai'anae.

Figure 12. Oahu Railway & Land Company Time Table (*The Pacific Commercial Advertiser*, 1889b:2)
In 1890, King Kalākaua again made a visit to the Mānana-Waimano vicinity spending the day in the area that was to be developed as Pearl City. The visit was described in the following article from The Hawaiian Gazette—

The Hawaiian Gazette

The Arion Excursion.† It Was a Grand Success Throughout—Between Five and Six Hundred People In Attendance.

May 13, 1890 (page 8)

Thursday evening the long looked for excursion of Honolulu Arion took place at Remond Grove, Manana, about twelve miles from Honolulu. The first train left the Gāhu railway depot at 6 o’clock when about two hundred and fifty persons were seated in the cars. Part of the Hawaiian band was on the train and played as it glided out of the depot. About the same number of people went down on the train an hour later the remaining members of the band enlivening the proceedings with popular selections. The palace car was attached to this train, and occupied by His Majesty the King and a party of friends. Another train left for the grove at 8:30 o’clock and quite a number of people availed themselves of the opportunity.

Arriving at the grove the scene was one of the most dazzling nature. The interior of the handsome pavilion was most artistically decorated with flags of different colors, and evergreens. The brilliant electric light with the colored lanterns hung over the grove, added a particularly brightening effect to the whole, which will not soon be forgotten by those present.

The Hawaiian Band was divided into two bodies, one playing for dancing in the pavilion, while the other played alternately on the outside. Following was the concert program:

March—Honolulu Arion
Overture—Festival
Gavotte—Holidays
Finale—Belisario
Overture—Berlin Life
Medley—German Marches
March—Always Ahead
Canzona—Summer Nights
Overture—Light Calvary
Hymn—Day of Judgment
Fantasia—Spring Time
March—Aloha Oe

Berger
Conradi
Eilenberg
Donisetti
Conradi
Bach
Faust
Kling
Suppe
Schneider
Kling
Berger

† The Arion Society was a German singing social organization founded in 1854.

The Watch on the Rhine
Hawai Pono.

The floor manager was Major H.F. Hebbard, and the floor committee, Messrs. E.B. Thomas, C. Kaiser, E.H.F. Wolter, J. Waibel M.E. Livingstone and Carl Widemann. The order of dances was: Lancers, waltz, polka, lancers, waltz, schottische, landers, waltz, polka, lancers. In the early part of the evening dancing was rather uncomfortable, the pavilion being taxed to its utmost capacity. Some of the ladies wore very pretty toilets, and when dancing was at its height the scene was most fascinating.

A tent had been erected just outside of the pavilion, and here His Majesty and party made their headquarters.

It is estimated that between five and ix hundred persons were at the Grove.

The committee of arrangements must certainly be congratulated on the very great success of the excursion. They were as follows: Maurice Goldberg, J. Asch, C. Kaiser, J.H. Reist, E.H.F. Wolter, C. Neldner, W. Wolters, H.F. Hebbard, Th. Wolf, C. Widemann, W. Strahlman, J. Kirsten.

During the evening President Goldberg presented Mr. Jas. Dodd, who is leaving for the States, with a very handsome gold badge in the shape of a horn, on the front side of which are the words Honolulu Arion, while on the other side is the inscription, "From friends of the Arion."

Mr. B.F. Dillingham, manager of the Railway, and the general superintendent Mr. W.G. Ashley, earned the gratitude of all for the excellent arrangements they had made for the transport of those who attended the excursion. There was an abundance of sandwiches, cake, ice cream, coffee, aerated waters of all kinds and nice cool lager beer.

The enjoyable feature of the evening was the thoroughly genial and courteous reception given to those in attendance by President Goldberg and other members of the Arion, so that none could fail to take away a most agreeable memory of the evening’s entertainment. The excursion was a happy thought on the part of the Arion, a more appropriate place to hold it could not have been found, and one pleasant fact remains, that all who were there were perfectly satisfied with this initial moonlight excursion.

5.1.22 King Kalākaua’s Land at ‘Aiea Sold

Throughout his rule, King Kalākaua faced challenges by foreign residents and business interests. He passed away on January 20, 1891, while on the West Coast. There are found in the historical records ties that the King shared with ‘Aiea. It will be remembered that earlier in this section of the study, the king was hosted at Dr. McGrew’s estate in 1874, a portion of...
which was later sold by McGrew to the King. Following King Kalākaua’s death, portions of
his estate were put up for sale to meet the needs of paying off debts. The ‘Āiea lands at
Kalua’o’opu (R.P. 795) and Ma‘ona (R.P. 2876) were among the lands listed, with a brief
description of the parcels.

The Pacific Commercial Advertiser
Kalākaua’s Estate.
The Land Sale Confirmed by Chief Justice Judd.

February 17, 1892 (page 4)

In the Supreme Court yesterday Chief Justice Judd heard the petition of Dr. G.
Trousseau for the confirmation of the sale of real estate belonging to estate of
His Late Majesty. The sale took place last Saturday at the auction rooms of Jas.
P. Morgan.

Mr. F.M. Hatch as attorney for the administrator, Dr. G. Trousseau, read the
returns of the sale and also the petition for confirmation of the same.

Hon. Cecil Brown’s sworn affidavit stated that the sale of the estate was largely
attended and fairly conducted. He thought that the prices realized were
proportionate to the value of the land.

Dr. Trousseau said that he considered lot No. 9 in the advertised list was sold for
too low a figure. The lot mentioned is situated at ‘Āiea, Ewa, and was sold to
John Bowler for $2500. The house on the land is an old one, and was
formerly occupied by Dr. McGrew. The land comprises about 22 acres and was
bought by His Late Majesty for $3500. The King had an artistian well bored that
materially enhanced the value of the property. The administrator thought that
he could rent the well alone for $200 a year. He also stated that the property
mentioned was the only piece in the whole list that did not sell for a good price.

After hearing the remarks of witnesses, Chief Justice Judd confirmed the sale
with the exception of lot No. 9 on the advertised list. He ordered that the
property be put up at auction again placing the upset price at $2500. If the
price is not raised, the sale to Bowler will be confirmed.

Administrator’s Sale!

February 29, 1892 (page 2)

By order of G. Trousseau, administrator, with the will annexed of His late
Majesty Kalākaua, I will sell at Public Auction, at my salesroom, Queen street,
Honolulu,

On Saturday, March 5 at 12 o’clock Noon,
plants, along with the alarming decline of the native population, led members of the Royal Hawaiian Agricultural Society to advocate for the importation of Chinese labor (The Polynesian, 1850-2). By August 1851, a group of 200 Chinese "Coolies" were requested with groups of men being assigned to various plantations.

5.2.1 From Kalo Lands to Rice Fields

One of the businesses to immerse on the landscape of 'Ewa was the cultivation of rice. By the 1820s, rice grown in both America and Asia was used as a staple in the diet of foreign residents of Hawai'i. In 1858, the Royal Hawaiian Agricultural Society engaged in experiments in rice cultivation on their farm lot at Kaimuhen in Nuuanu Valley. In 1859, Society farm manager reported rice was —

...now growing luxuriantly in some of the hitherto waste and unseemly kalo patched by the river side. Already a crop has ripened and yielded largely, and when all the kalo land [on the farm parcel] shall have been reclaimed and planted with rice, we calculate an annual yield of some 40,000 pounds. ... (The Pacific Commercial Advertiser, 1859:1)

It further suggested that that rice was one of the most important plants being cultivated. It was later reported that H. Holstein, garden manager had sent —

...a sample of the new crop of rice raised in the above garden. The rice is small in size, but clean in appearance and well formed. Its hue is little dark at present... Mr. Holstein demonstrates, by actual experience, that the common taro lands will grow three crops of rice a year, yielding together 12,000 pounds of rice to an acre, equivalent, according to market value at home, to from five to six hundred dollars per acre—at an expense of only $15 per acre. ... (The Polynesian, 1859:2)

While few acted on the crop in the late 1850s, within a couple years, the Carolina variety of rice grew in popularity and began to fill in lo'i kalo. In July 1861, it was reported that interest in rice cultivation was growing. Dr. S.P. Ford grew rice in Moanalua and within a few years, the success of Ford's experiment led to expanding rice fields in lo'i across the irrigated lands of the Kalaauo-'Aiea vicinity.

The Polynesian
Rice.

July 6, 1861 (page 2)

Some time ago we noticed with becoming encomium, the efforts made by Mr. Holstein of the Agricultural Garden, to introduce and develop the Rice culture in this country. We are glad to see the example followed by others, and notice a field planted by Dr. Ford, which certainly is one of the most beautiful sights that the eye can rest upon. There can be no longer a doubt, and should be no hesitation in engaging in the culture of rice by any or all who have suitable land for the purpose. We would say to the farmers around Honolulu: You have plenty of taro patches lying fallow; here is plenty of seed at hand; put this and that together like sensible men, and in four months' time you will see a crop that will revolutionize your ideas of agriculture, and make you independent for life, if persevered in. Either Mr. Holstein or Dr. Ford will give you all necessary information of the preparation of the land, mode of planting and manner of taking care of it. Taro, except for domestic food, is unsealeable; but if you put the balance of your irrigated lands in rice, you will always have a cash article at hand, and need not go yourselves nor send your children to the seaports to earn by questionable means a precarious dollar to pay your taxes, your ministers, or for your luxuries of life. Create your own capital, and do not longer stand, hat in hand waiting for the crumbs that the winds may drop into it.

The Pacific Commercial Advertiser
Rice Culture.

July 11, 1861 (page 2)

On the 1st of March, Dr. Ford planted four pounds of Carolina rice seed in a taro patch containing little less that quarter of an acre (7-32ds) One Chinaman was two days in preparing and planting the seed. When of sufficient growth to transplant, the same man transplanted it in a quarter of a day. In four months and three days from the date of transplanting, the crop was gathered and yielded 1163 pounds. The estimated expense of labor, rent of land, &c. is about $416.50. Doctor Ford has the seeds for sale. At a fair valuation, domestic rice is worth six cents per pound, which would make the above yields with $69.78. There is no good reason why 1000 tons cannot be raised as well as a thousand pounds, this enabling us not only to supply all our large home consumption, but even export any surplus raised.

The Polynesian
Rice.

September 7, 1861 (page 2)

Dr. Ford is now putting in about ten acres of land with rice in Moanalua, and a great many natives, who had been in Moanalua, and great many natives, who had been provided with seed by Mr. fuller, of the Board of Education, have already planted more or less—we cannot say exactly how much in the aggregate—and it is confidently expected that next spring every available taro patch, far or near, will be planted with rice.

October 26, 1861 (page 2)

Rice. Onward goes the rice culture on Oahu at a rate that promises to gladden
Ka Lahui Hawaii
Na Anoai.

Mei 3, 1877 (aoao 3)

Ma Waimano, Ewa, Oahu, ua hoomoe ia kekahi aauai papa i hiki aku konua loa i ka aanea e pila ka mile, e maana aku ana mai Waimano amo aku la ma ke kai a kau iu na o kekahi mokupuni iawaena o ke kaikouno o Puuloa, a ke kanu la ka laiki, a o ka oia o ka ha wai lohi ma ke awalou o Puuloa.

Ma Ewa i keia mai ka, ka kuulaha loa nei ke kanu ana i ka raikai mai na Pake a i na Hawaii, mai Halawa a hiki i Honolulu a malalo loa aku. Me he la aole ike ia ana ia ma wahi na maka o ka ai makuaehine he kalo.

May 3, 1877 (page 3)

At Waimano, 'Ewa, O'ahu there has been laid an 'auwai papa (wooden water channel/flume), which is almost one mile long. Beginning at Waimano and running to the shore and on an islet in the bay of Pu'uloa, and there is being planted rice. It is the longest of the water channels on Pearl Harbor.

These days at 'Ewa, the planting of rice is spreading among the Chinese and the Hawaiians, from Halawa to Honolulu and beyond. There will come a day when the mother food, taro, shall not be seen on the land.

Ka Hae Hawaii
Olelo Hoolaha.

August 25, 1858 (aoao 83)

'Aheua oukou e ka poe makemake aina hoolemalima, ke hai aku nei au oukou, owau no ka mea aina hoolemalima me ka poe e makemake mai ana. Eia malalo iho ka inoa o na wahi i wahlo ali ma u ma apana aina nei i manoa e hoolemalima me keia mea keia mea. O Poupoouwela, ili aina kalo ma Honolulu i Ewa, O ka pa aina kalo, a me na koko ia ma Honolulu kai, o ka pa aina kalo ma Waimalu a me kona kai lawaia, a me

August 25, 1858 (page 83)

Hear ye, those who may want to lease land, I hereby tell you that I will be entering into a lease with those who are interested. Here below are the names of the places and situation of those parcel of land which may be leased to various parties. Poupoouwela, an 'iil of Kalo land at Honolulu, 'Ewa. An enclosed taro land and fish pond at the shore of Honolulu. A kalo lot at Waimalu, and the associated fishery...
5.2.2.2 Pilikia ka Pono o ka Lehulehu: James Dowsett and Associates – Moanalua to Kalauao and the 'Ewa District

James I. Dowsett was born on O'ahu in 1829, among the first Caucasian children to be born in Hawai'i. By the 1850s, Dowsett was engaged in business ventures, including ranching in Honolulu and eventually ownership of the Pu'ula'o salt works in Honolulu. He went on to control large tracts of land across the 'Ewa District, business properties in Honolulu, and lands at various other locations. Lands under his management were held in both fee-simple and leasehold interest. In 1865, he held a lease on the Honolulu fishery within Pu'ula'o and purchased partial interest in Moku'ume'ume (Ford's Island). By 1873, he held ownership interest in a portion of Kalauao Ahupua'a and extended his ranching operations from Kaluakii to Leiloeua. As was the case with other large landowners, Hawaiians and others found themselves sometimes restricted from access to natural resources on lands controlled by the "estates." Indicators of the kinds of land use and restrictions placed on local residents are found in the articles below.

The Pacific Commercial Advertiser
Notice.

December 16, 1889 (page 3)

All Persons Are Hereby Forbidden from going on to the under mentioned lands, for the purpose of shooting birds and game. The lands are: The Ahupuas of Kaluakii, Moanalua, Ha'iwia, Aiea, and a part of Kalauao. These extend from the mountains to the sea; boundary commencing two miles from Honolulu and ending nine. The government road runs through these lands and in most parts is sixty feet wide. Owners of dos are hereby notified that said animals are liable to be poisoned should the wander off said road. All shooting privileges that have been granted heretofore are now annulled. J.I. Dowsett.

The Daily Bulletin
Notice.

December 21, 1891 (page 5)

All shooting of game over the lands of Wahiawa (Waianae uka), Waimano, and right. Also half of the island of Moku'ume'ume at Ewa. These are the place that I am considering to lead. If you desire any have any of these parcels of land for lease, you should come to my residence and speak with me.

Haalelea.
Honolulu, August 23, 1858.  
Haalelea [Levi]  
Honolulu, August 23, 1858.

The Pacific Commercial Advertiser
Notice.

August 8, 1892 (page 3)

All Shooting Of Game On the Lands of Moanalua, Ha'iwia and Aiea, [below the Government Road] and Maunalua, Wahiawa (Waianae-uka), Wai'au, Waimano [Waimano]. Waiawa, Manana, the ill of Hanohano [below the Government Road], and the lower or makai portion of Kapakahi, Waikele, Ewa, all on the Island of Oahu, H.I., is strictly forbidden without the necessary permit, which can be had on application to J.M. Dowsett, at Bishop & Co.'s.

S.M. Damon  
J.M. Dowsett  
Hoaee Ranch,  
J.M. Dowsett.
Honolulu, August 8, 1892.

The Pacific Commercial Advertiser
Notice to Sportsmen!

August 1, 1893 (page 4)

Notice Is Hereby Given That I have this day leased to Henry Davis and his associates the exclusive right to the game reserves of the lands of Leilehua Ranch, including Ha'iwia and Aiea, on the mauka side of the Government Road, district of Ewa and Waianae, Oahu, and that I shall protect them to the full extent of my ability in the undisturbed enjoyment of above shooting rights. [signed] J.I. Dowsett.

Honolulu, August 1, 1893.

The undersigned give notice that all persons found disregarding the above notice will be promptly prosecuted without favor or distinction.

Henry Davis,  
E.I. Spalding,  
Sam'T. Wilder  
Lessees.
Honolulu, Aug. 1, 1893.

The Pacific Commercial Advertiser
In the Supreme Court of the Hawaiian Islands.
November 3, 1893 (page 4)

September Term, 1893.

James I. Dowsett vs. Maukeala (k), Naea (k), Kaumaea (k), Hina (w), Elikai (k) and Kalahili (k).

Ejectment.

Before Judd, C. J., Bickerton, and Frear, JJ.

The Court declines to reverse the decision of the Circuit Court setting aside the verdict and ordering a new trial on the ground that the verdict is contrary to law and the evidence.

Opinion of the court by Bickerton, J.

This cause came on for hearing at the February term, 1893, of the Circuit Court of the First Circuit before a mixed jury, and resulted in a verdict for the defendants, to which the plaintiff noted an exception on the ground of its being contrary to law and the evidence and gave notice of a motion for a new trial, which motion was duly filed and argued, and the trial judge rendered and filed his decision ordering that the verdict be set aside and a new trial had. Whereupon defendants filed their exception to said decision and order. The matter now comes here on a duly allowed bill of exceptions.

The decision of Judge Whiting, on the motion for a new trial and now appealed from, is as follows:

Trial of the above action was had at the February term, 1893, of this Court, and a verdict rendered by the jury for the defendants. The plaintiff claimed title by mesne conveyance from the patentee; the defendants claimed by right of adverse possession. The parcel of land in dispute is situated at Ewa, Oahu, called “Kapuaikaula,” being a portion of the ahupua’a of Halawa. The record title of the plaintiff was proved without dispute direct from the patentee by mesne conveyance to himself who claimed as lessee from the trustee of the estate of Emma Kaleoanaiani of one half of the ahupua’a of Halawa. The defense being adverse possession, claim was made of such possession for a period even prior to the Land Commission.

The jury found a verdict for the defendants and the plaintiff moved for a new trial on the ground that the verdict is contrary to the law and the evidence; and also that the Judge erred in refusing to charge the jury “that a mere occupation of a portion of the ahupua’a without fencing the same off, or positive acts of ownership, is not a sufficient notification of a claim of title so that the statute of limitation may run in favor of the occupier; the landlord must have notice of the adverse claim before the statute commences.”

I have carefully reviewed the evidence and charge to the jury, and I am of the opinion that the verdict is contrary to the law and the evidence that a new trial should be granted, as the jury neglected properly to consider the facts and have overlooked prominent and essential points in the evidence. There are many such points in this case, viz, that defendants’ ancestors and a part of defendants were on the land of Halawa and the place in dispute before the Land Commission, and remained there from that time, but no claim for a kuleana nor any claim whatsoever was made by them or any one on their behalf for the ancestors before the Land Commission; and that the parcel of land in dispute, “Kapuaikaula” is not an ill, lele or kuleana of the ahupua’a of Halawa, but was merely a portion of the ahupua’a as of a whole land; it was not a division of a land.

That this portion of the ahupua’a of Halawa was occupied by the fishermen and hoaianas of the konohiki and that neither the defendants nor their ancestors were kuleana men or konohiki.

That defendants and their ancestors were living under the konohiki, and were hoaianas and kahu of the ali, and the defendants continued as such under the different konohikis and their luna’s of the land until Queen Emma’s death in 1885; and no claim of adverse title was made until after her death; and no notice given to any konohiki or luna of the land that defendants were claiming this parcel of the land as their own till after her death.

That the original holding of defendants was permissive and with the consent of the konohiki.

That Holohokahi, who died in 1872, from whom the defendants claim, was the luna of the konohiki, and he was succeeded by others.

That defendants paid rent to Dowsett, who had charge of the land within twenty years last, and otherwise attorned to him.

That the premises were fenced, not definite in area or boundaries, and continuous possession, and that not “defendants” possession was not exclusive.

That defendants living on a piece of land was consistent with the owner’s rights, originally being permissive, until direct notice was brought to the owner of an adverse claim.

I am of the opinion that the jury did not properly consider the question of the time when the defendants set up a claim adverse to the owner, nor did they properly consider the question of notoriety of adverse possession by defendants so as to bring it to the notice of the owner, nor that the claim of defendants was distinct and hostile to the rightful paper title nor the points above stated.
The second point of plaintiff’s motion I overrule.

The motion for a new trial is granted, and the verdict set aside.

By the Court.

The trial of the case occupied several days, and the evidence adduced was very voluminous. We have carefully examined and considered all this testimony, and we are of the opinion that the findings of the trial judge and the grounds upon which he granted a new trial are well sustained by the evidence. It is clearly a case of permissive holding on the part of the defendants and not one of adverse possession. Elka, one of the defendants says, “The first time that I publicly stated to anybody that I owned the land and would not pay rent, was when Mr. Dowsett, junior, came there and asked, and I was the only man, the one man of the whole lot that refused to pay rent, and said that the reason was that the land was mine,” and when asked how long ago that was, he says, “Not very long ago; I don’t remember what year it was, but not very long ago.” The evidence of other witnesses would indicate that this visit of Dowsett, junior, took place about six or seven years ago.

This case seems to us to be almost a parallel one to the case of C.R. Bishop et al., trustees, vs. Kala et al., 7th Haw., 590. In that case the verdict was set aside and a new trial ordered, the Court saying, “The weight of the whole evidence is so clearly and decisively in favor of the plaintiffs, that we feel that the jury must either have misunderstood its effect or have acted, when they returned a verdict for defendants, from some bias or prejudice.” We feel that this language is applicable to the case at bar. We have before us the charge of the Court to the jury in this case, and the law was well laid down and explained, as to what constituted adverse possession and what constituted only permissive occupation or possession. This must have been disregarded by the jury, for if they had applied the law as given by the Court to the evidence, they could not have found the verdict they did.

The decision and order of the Circuit Court setting aside the verdict and ordering a new trial is sustained.

Exceptions overruled.
C. Brown for plaintiff; C.W. Ashford for defendants.
Honolulu, October 26th, 1893.

When James Dowsett died in 1898, the process of settling his large estate was initiated. On November 7, 1899, a sale of a portion of the estate was announced. The notice included background on lands of interest to this study— including areas in use for ranching, rice fields, and fisheries.

The Pacific Commercial Advertiser

Jas. F. Morgan
Administrator’s Sale.
Estate of James I. Dowsett, Deceased.

November 7, 1899 (page 7)

The undersigned, Administrator of the Estate of James I. Dowsett, deceased, gives notice that, for the purpose of paying the debts of said deceased, he will sell at public auction at the salesrooms of James F. Morgan, Honolulu.

On Saturday, the 16th Day of December 1899, at 12 o’clock Noon. All of the following property:

Leiluhia Ranch.
Consisting of following leases:
“Waianae-uka,” “Pouhala” and “Waikakalaua,” is by survey made by W.D. Alexander in Crown Land Book of Surveys, pages 160, 161 and 162, containing an area of 1,378 acres, leased by Commissioners of Crown Lands to Henry E. Whitney (and assigned to the late J.I. Dowsett) for thirty years from January 14th, 1882, at a yearly rental of $500.00 payable semi-annually.

Lease of Kalena [Honoululi] made by Mrs. Kahanuu Meek to the late J.I. Dowsett for fifteen years from September 1st, 1889, at a yearly rental of $200.00 payable semi-annually.

Together with all cattle and horses on the above lands, consisting of about 1,500 head Cattle and 25 head Horses.

There are on this land all Buildings, Pens, Etc. necessary for carrying on a first-class ranch...

Aiea.
As described in Crown Land Book of Surveys, page 163, survey made by C.J. Lyons; area 1,175 acres, leased by Crown Land Commissioners to Henry E. Whitney (and assigned to the late J.I. Dowsett) for thirty years from January 14th, 1882, at a yearly rental of $250.00 payable semi-annually.

All that portion of Aiea which lies between Oahu Railway and Land Company track and 650 feet altitude has been leased and rent paid in advance for the full term of this lease.

Excepting (1st) about 6 1-3 acres rice land formerly leased to Kam Tow and for which he is now paying a yearly rental of $150.00; (2d) lease to Hop Sing (now expired) containing three acres, more or less (formerly used as a fishing station) at the Aiea depot, and now in possession of Honolulu Sugar Company, and for which they paid a yearly rental of $200.00 last year.
Aiea Fishery is rented for $45.00 a year...

Kahului.
As per survey in the Book of Crown Lands, page 190, containing an area of 1,344 acres; also the Fish Pond "Well" leased by Commissioners of Crown Lands to J.I. Dowsett for twenty-five years from July 2d, 1888, at a yearly rental of $800.00 payable semi-annually.

The Fish Pond and Rice Land at Kahului is leased to Sarepta A. Gullick (and assigned to John Antone) for twenty-three years from July 2d, 1890, for a yearly rental of $600.00 payable semi-annually.

A portion of Kahului lying between the Oahu Railway and Land Company track and Government road and adjoining Kaliihi is leased to Pacific Guano and Fertilizer Company for 17 ½ years from January 2d, 1896, at a yearly rental of $200.00.

The mauka portion of Kahului is leased to John Grace (and assigned to Star Dairy) for eleven years from July 2d, 1897, at a yearly rental of $1,000. Payable quarterly.

There is reserved from the Star Dairy lease a portion of Kahului adjoining the Kaliihi boundary and running 800 feet along the Government road and 700 feet deep.

Halawa.
One-half of which is leased to the late J.I. Dowsett by A.J. Cartwright, Trustee for Queen Emma Estate, for twenty years from September 1st, 1888, at a yearly rental of $1,300.00 payable semi-annually in advance, and one-half is leased from Trustees of B.P. Bishop Estate for twenty years, from September 1st, 1888, at a yearly rental of $900.00 payable semi-annually in advance.

There is reserved to the Trustees of Bishop Estate from their one-half of Halawa all Fisheries, Fish Ponds and Fishing Rights. The Island of Kauaia and the Pond of Makalapa and Kunana; also the 1B of Kunana and its Fisheries; and all the land above or mauka of an imaginary line drawn three miles mauka of and parallel with the old Government road; also one acre of Taro Land in the locality known as Kaneneh.

All that portion of Halawa lying between the Oahu Railway and Land Company track and an altitude of 650 feet has been leased and rent in advance for full term of the lease.

Excepting (1st) lease dated September 28th, 1888, to Chin Lau Chong and others and now assigned to Honolulu Sugar Company, containing 47 82-100 acres Rice Land, for which they pay a yearly rental of $1,000.00 semi-annually;

(2d) lease dated January 1st, 1889, to Chulan & Co., for twenty years from September 1st, 1888, and now assigned to Honolulu Sugar Company, containing 66 74-100 acres Rice Land, for which they pay a yearly rental of $1,000.00 semi-annually; (3d) lease dated November 27th, 1897, for ten years from September 1st, 1888, to Chow Ah Po for 17 92-100 acres Rice Land at a yearly rental of $30.00 payable semi-annually; (4th) and all of that part of Makalapa paddock as is not arable and which is fit for pastureage.

A portion of Halawa, containing 780 acres, lying makai or below the Oahu Railway and Land Company track, has also been leased to the Honolulu Sugar Company and rent paid in advance for the full term of this lease.

One small Fish Pond, known as Waialo, and House Lot on the beach at Halawa is leased to John Defories for 11 ½ years from March 1st, 1897, at a yearly rental of $50.00.

Terms cash. U.S. gold coin.
Conveyances at expense of purchaser.
J.M. Dowsett.
Administrator Est. of J.I. Dowsett.

5.2.2.3 Tally of Fishery Resources from 'Ewa Being Sold in the Honolulu Market

After the illegal overthrow of the Hawaiian Monarchy in 1893, the perpetrators continued their steady march towards dollars and cents economy. Fishery resources were among the traditional resources that were becoming monetized with a direct impact on the fisheries in the Pu'ula region. The traditional system of haliwe or kuapo (exchange of goods), where po'e lawa'a (fisher-people) provided ocean resources to po'e mahi'a (agriculturists) and vice versa in exchange for goods was practiced from time immemorial as a means of supporting family and community life. Under the new system the people found that they needed to have money to purchase items, and/or access rights to those environments which were once available to them as a means of gathering sustenance for home. In the following article, readers are given a glimpse into the amount and kinds of fish which came into the Honolulu fish market a few days in late 1895.

The Pacific Commercial Advertiser
How Fish Come In.
Three Days’ Record of Receipts at the Market. Good Proof that This is a Fish-eating Community - From 3000 to 20,000 in Three Days.

November 8, 1895 (page 5)

In order to furnish the public with some idea of the increase of fish received at the fish market, a record of three days is given below. Mr. Keliiop, the inspector at the fish market, has kept a careful record of all the fish received since the first removal of restrictions. The record of November 4th, 5th and 6th...
5.2.2.5 Condemnation of Fishery Rights

After Hawai‘i was taken as a Territory of the United States on June 14, 1900, the large native land holdings (ali‘i trusts and heirs) were required to state their claims to fisheries which had traditionally been a part of the ahupua‘a. Through court proceedings, the claims would be adjudicated. As a part of a larger program, the U.S. government engaged in a survey of marine resources of the Hawaiian Islands (Jordan and Evermann, 1901). In their study, they reported on the nature of fisheries, including fishponds, and the Hawaiian custom of private fisheries.

The rich fisheries of the region known as Ke Awa‘ula o Pū‘ukula or the Pearl Lochs, included at least 27 loko i‘a for which they could gather information. These included:

**Pearl Lochs:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Area in Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Pohūla, in Waieke, remnant leased</td>
<td>22</td>
</tr>
<tr>
<td>* Kauikuu, in Waieke</td>
<td>41</td>
</tr>
<tr>
<td>* Maahā, in Waieke</td>
<td>48</td>
</tr>
<tr>
<td>* Mokuula, in Waieke</td>
<td>23</td>
</tr>
<tr>
<td>* Eo, in Waipio, partly filled</td>
<td>137</td>
</tr>
<tr>
<td>* Name not known, in Waipio</td>
<td>5.7</td>
</tr>
<tr>
<td>* Hanaloa, in Waipio</td>
<td>195</td>
</tr>
<tr>
<td>* Moo, in Waimāna</td>
<td>13</td>
</tr>
<tr>
<td>* Kuhilākō, in Wai‘awa</td>
<td>133</td>
</tr>
<tr>
<td>* Nameless pond</td>
<td>28</td>
</tr>
<tr>
<td>* Aapala, in Wai‘awa</td>
<td>76</td>
</tr>
<tr>
<td>* Paauau, in Wai‘awa, partly filled</td>
<td>320</td>
</tr>
<tr>
<td>* Weloko, in Waimāno</td>
<td>21</td>
</tr>
<tr>
<td>* Kukona, in Waimāno</td>
<td>27</td>
</tr>
<tr>
<td>* Lakahakoae, in Wai‘au</td>
<td>1</td>
</tr>
<tr>
<td>* Paakea, in Waimāna</td>
<td>12</td>
</tr>
<tr>
<td>* Opu, in Kuhalau</td>
<td>10.5</td>
</tr>
</tbody>
</table>

less, as per the survey of Mr. M.D. Monsarrat; also the Loko Kunana, the Loko Muhwai and the Umikii stream at Halawā, Ewa.

Lease to be for the term of 21 years, from July 1st, 1901. Upset price, $1,250 per annum, payable semi-annually in advance in United States gold coin.

Possession of the Loko Kunana, the Loko Muhwai and Umikii to be given on and after April 1st, 1902.

Purchaser to pay all taxes, rates or charges whatsoever. All charges for expenses of lease, etc. to be that purchaser’s expense.

For further information apply at the office of the Land Agent of the Bishop Estate, 77 Merchant street.

5.2.2.4 Hālawa Fishponds Offered for Lease

The Hawaiian Gazette

Auction Sale or A Leasehold

June 14, 1901 (page 9)

On Saturday, June 15, at 12 o’clock noon at my salesroom, 65 Queen Street, I will sell at public auction, by order of the land agent of the Bishop Estate, the lease of all the portion of the Loko Makalapa, at Halawā, Ewa, owned by the Estate of Bernice Pauahi Bishop, and containing an area of 29 acres, more or
Describing private fisheries, and the fact that they were of "considerable value" to the owners, the 1901 report observed:

"...probably the most peculiar feature of the Hawaiian fisheries is the well-developed principle of the private ownership of the fishes found in the open sea and bays to within a certain prescribed distance from shore. In order to clearly understand this condition of affairs it will be necessary to revert to the early history of land tenures in the islands... [page 454]"

Each island was divided into "moku," or districts. The subdivisions of a "moku" were "ahu'aua," which is really a unit of land in the islands. The "ahu'aua" are generally long, narrow strips, running from the mountain to the sea, include mountain, the plateau, [page 455] the shore, and for a certain distance out to sea. The distance into the sea was to the reef, if there was one; if not, to one geographical mile from shore. The owner of this portion of the sea naturally had the right to control it, so far as the fishing was concerned, the same as he did his land. When he placed a tabu on it, branches of the hau tree were planted it all along the shore. The people seeing this token of the tabu respected it. With the removal of the hau branches, indicating that the tabu was lifted, the people fished as they desired, subject only to the tabu days of the priest or ali'i, when no canoes were allowed to go out upon the water.

In accordance with the law which went into effect June 14, 1900, the fishery rights will cease on June 14, 1903. Some of these fishery rights are of considerable value. Close to Honolulu are two fisheries belonging to one person which bring in a yearly rental of $1,375. The fisheries on Oahu are the most valuable, owing to the excellent market for the sale of fish at Honolulu. A few owners allow the general use of their fisheries to the fishermen, reserving one species for themselves, as they are allowed by law to do... [page 456]

Jordan and Evermann (1901) also discussed the "oyster fishery" for which the Pu'uloa region was famed and which in traditional times had been protected by deity like Kāne'aulana,

<table>
<thead>
<tr>
<th>Modern History of the Project Area and its Vicinity</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Puniu, in Kalawao</td>
</tr>
<tr>
<td>* Kunana, in Kalawao, partly filled</td>
</tr>
<tr>
<td>* Loko Muliwai</td>
</tr>
<tr>
<td>* Kahakupahoku, in Kalawao</td>
</tr>
<tr>
<td>Amana, in Kalawao, filled up</td>
</tr>
<tr>
<td>* Name not known, in Kalawao, partly filled</td>
</tr>
<tr>
<td>* Okiokolepe, in Puuokai</td>
</tr>
<tr>
<td>* Kapamuku, in Puuokai</td>
</tr>
<tr>
<td>* Waiahao, Kalawao</td>
</tr>
<tr>
<td>*used commercially [page 429]</td>
</tr>
</tbody>
</table>

Jordan and Evermann (1901) also discussed the "oyster fishery" for which the Pu'uloa region was famed and which in traditional times had been protected by deity like Kāne'aulana,
February 8, 1902 (page 13)

When the new Pualoa branch of the Oahu railroad is completed one can reach the [Hawaii Yacht] club in a half hours’ time by train. There will be a ferry system inaugurated to convey passengers and teams across the quarter mile stretch of water between the mainland and the Pualoa peninsula. The yachts can reach the anchorage in the average winds in an hour and a quarter. [Figure 13].

The nearness to the entrance of the harbor will enable the boats leaving the city late in the afternoon to drop their hooks off the house, which would not be possible were the location further up the lagoon at Waianae or the Peninsula, for the winds moderate or die out completely in the evenings and they would not have the means of getting to their destination. Several delightful inland trips can be taken from the club, and as a rule the return is made with the wind aft; they can always manage to pick up moorings even if the wind grows faint.

A trip down the west locks can be made for five miles. This is the deepest of the three locks, and the depth is maintained in most places right to the bluff, coral banks. There is little danger of grounding and no pilots are necessary. Probably some of the prettiest scenery is to be found in this sail. The overhanging, ledges, the effect of erosion for centuries, the hardy algeroba often growing on the coral formation that projects over the water, is of interest to everyone who has been favored with a trip down this lock on a yacht.

Beyond the last turn the scenery becomes more varied and delightful, with the low lying marsh lands in the foreground, the tall coconut standing like sentinels on the banks of the deep-green rice fields, the waving sugar cane on the lower spurs of the Waianae range and beyond the lofty peaks of Kaala complete the picture. This part of Pearl Harbor used to be alive with mullet, which made their presence known by leaping from the water in their playful way.

A beat up to the Peninsula, three miles from the club, is another trip, and the one that is most frequently taken. One can sail past the point and down the middle locks for about two miles over the course used by the rowing clubs for their principal events. Then a sail to Waianae, where the rice-mill is situated, always means a delightful fresh water swim in the pond back of the mill. This is a five-mile sail from Pualoa. On the return most of the yachts sail around the east side of Ford’s Island, which now looks like a shorn lamb since the cane has been harvested.

Pearl Harbor affords more extensive sailing than most people imagine. The sail from the club around the Ford Island race course necessitates a boat traveling some ten miles. Few of the cruising yachts on their trips to the harbor sail over the water of but one lock on a trip. Sailing through all the three locks, leaving out the cozy little bays that everywhere indent the shores, a yacht covers over thirty miles. The principal danger points have now been staked and buoyed so that one who has never explored the harbor to any great extent need have no fear of getting ashore...

Figure 13. Map of the Pearl Harbor Yacht Race Route (The Pacific Commercial Advertiser, 1902a:13)

The Pacific Commercial Advertiser
Ewa Wants New Road. The Board Makes Report to Cooper To Macadamize Whole District.

October 18, 1902 (page 2)

Special Agent Cooper has received from the Ewa and Waianae road board a report of the work in the district for the past year, and the recommendations for future necessities. The road board, of which J.A. Low is chairman, asks for an appropriation of $15,691 for the construction of bridges and the further sum of $50,000 for the macadamizing of all the road in the vicinity.

The board has expended during the past year over $15,000 in macadamizing
road and making other improvements at Waipahu and Halawa. As to the recommendations for the future the board says:

Your road board beg further to advise you of the work now under way and to call your attention to the condition of the roads throughout the district and to ask your assistance in securing special appropriations to further its program. The desire of the road board is to macadamize the roads throughout the district. This work has been carried on up to the present time with road board funds solely. Great care has been exercised to accomplish as much and as good work as possible, but the road board find themselves handicapped for want of funds to prosecute the work as quickly as required. A number of bridges throughout the district are now so frail and weak that they will not carry a steam plow or a steam rolled, and roadways have to be made on one side going through streams to permit such large implements to pass along the road. Your road board recommend that these bridges be replaced by stone and concrete bridges. Throughout the district we have unlimited quantities of material in the way of stone which will be suitable for this work. We call your special attentions to the following streams, which of necessity sake, require that new bridges be installed within a period of 18 months. None of these bridged would be extensive in their construction. We ask that all of the bridges be constructed to a uniform width of 18 or 20 feet. We refer especially to the bridges crossing Halawa stream, Aiea, Kaluaoo, Waimalu, Waiawa, two bridges in Honolulu, and one in Waianae.

We advocate stone bridges because of the unlimited quantity of material we have at hand in these streams, and because of the permanency of the construction and because of the being sufficient labor in the district that is desirous to work which could perform this class of work, and further because we believe a stone and concrete bridge to be a cheaper bridge than a steel bridge, all things considered. The two steel bridges erected in this district by means of special appropriations at Waipahu and Kipapa are in good shape, but require constant attention.

We estimate the following sums of money for the several bridges as an outlay for the complete construction of the same:

<table>
<thead>
<tr>
<th>Bridge Location</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halawa No. 1</td>
<td>$960.18</td>
</tr>
<tr>
<td>Halawa No. 2</td>
<td>1086.75</td>
</tr>
<tr>
<td>Aiea</td>
<td>2488.00</td>
</tr>
<tr>
<td>Kaluaoo</td>
<td>1907.70</td>
</tr>
<tr>
<td>Waimalu</td>
<td>1942.00</td>
</tr>
<tr>
<td>Waiawa</td>
<td>3426.20</td>
</tr>
<tr>
<td>Honolulu No. 1</td>
<td>972.25</td>
</tr>
<tr>
<td>Honolulu No. 2</td>
<td>998.10</td>
</tr>
<tr>
<td>Waianae</td>
<td>1950.12</td>
</tr>
<tr>
<td><strong>Total for Bridges</strong></td>
<td><strong>$15,691.30</strong></td>
</tr>
</tbody>
</table>

In addition to this we beg further to request a special appropriation to assist in the macadamizing of the roads throughout the district. We would advise you that the present work of macadamizing is necessarily slow work on account of the limited funds to the credit of the road board... we should have at least an appropriation of $50,000.00 for macadamizing of roads...

We further ask a special appropriation of $2500.00 for macadamizing the Puuoloa road from the beach to the R. R. depot, and in connection with this would respectfully draw your attention to the rough grade and bad rocky hill in the Puuoloa road just after leaving Moanaau. This portion of the Puuoloa road is out of our district, but as those who reside at Puuoloa are compelled to traverse it...

### 5.2.3 Ranches of the Oahu Railway and Land Company (1929)

In August 1929, the University of Hawaii printed Research Publication No. 5, “A Survey of Livestock in Hawaii,” written by L.A. Henke. By the time of the publication, the ranch lands of 'Ewa were well established and largely connected with the O.R. & L. Co. Henke (1929) published the following background on ranches in 'Ewa.

The Oahu Railway and Land Company Ranches are located along the line of the railroad and consist of five more or less separated portions,—Honolulu, Nanakuli, Mokuleia, Kawaiola and Kahuku. The total area consists of approximately 34,400 acres and with the exception of perhaps 200 acres, all the Company’s pasture lands are held under leases.

The cattle number about 3,200 head, of the Shorthorn breed with the exception of 400 at Kahuku dairy, which are largely Holsteins and Jerseys.

The ranch slaughters its own cattle and the beef is largely sold to country dealers. Cattle are marketed when two to three years old and dress out at 400 to 500 pounds. About 850 are slaughtered annually as an average but the number varies considerably from year to year.

Mr. Von Holt introduced Shorthorn bulls shortly after he took charge in 1890, they being considered good hustlers and good for both dairy and beef purposes.

Seeds of various improved grasses have been scattered over various sections without much success. Pigeon peas (Cajanus indicus) have been planted in scattered areas and haole Koa seed has been distributed.

Some 200 light horses and a few mules are carried on the different ranches and the Honolulu section has about 100 Duroc Jersey hogs.

The different sections of the ranch are best described separately. [page 63]
Prosopis juliflora

Acacia farnesiana

5.3 Plantations and Oahu Railway & Land Company Development

As early as the 1850s-1860s, experiments with small sugar plantations were underway in the 'Ewa District with plantations at Hālawa and Waimālu. Under the heading "Hālawa Plantation," a brief notice in The Pacific Commercial Advertiser reported that "Sugar and Molasses, from the above plantation for sale in quantities to suit by Aldrich, Walker & Co." (1865:1).

The Pacific Commercial Advertiser of January 18, 1868 included an article in which a traveler through the 'Ewa District referenced two plantations, one at Hālawa and another at Waimālu.

The Pacific Commercial Advertiser
Kāla Mountains, January 1868.
Ride to Ewa.

January 18, 1868 (page 1)

...We descended the ridge rapidly, passed the ravine of Hālawa, and over an elevated table land into the bright fairy-like valley of Waimālu, where a Roman catholic church and the sugar mill and plantation of Mr. Williams are situated [at Wahioka]. On over the table land we galloped, descended into another valley where a bright stream was winding its way, and some neat cottages and hale pilis appeared to the right and left of the road, with some evidence of cultivation around. The sugar plantation of Mr. McColgan was passed to the left of the road. It is immediately on the margin of the bay, where several large springs gush out of the bluff near the sugar mill. We paused not, but continued on to where two cyclopean rocks formed a gate-way leading to the left of the road, where a few rods ride brought us to the hospitable residence of Victor, near the murmuring shores of the bay. We were cordially received, enjoyed his hospitality in the form of a most excellent roast beef, fresh butter, the best French bread and cool spring water...

In the January issue of The Pacific Commercial Advertiser, it was reported that "Mr. Williams, the District Justice of Hālawa, employs ten Chinamen on his sugar plantation who sleep in a house by themselves" (1873b:3). Another island resident, writing in 1873, presented reasons with a different point of view on the emerging sugar interests in the Hawaiian Kingdom with reference to several locations across the islands, including the small Hālawa and Waimālu vicinity plantations in 'Ewa. The author also referenced the fate of the Hawaiian people themselves as lands were converted to sugar, and in the larger series explored annexation of the Kingdom to the United States:

The Pacific Commercial Advertiser
Annexation—No. 7

April 12, 1873 (page 3)

Let us examine the capacity of these islands for a sugar producing country... The high plain extending from Ewa to Waialua, owing to its aridity and the impossibility of irrigation, presents a limited capacity for agriculture. Probably two square mile might be cultivated, with uncertain prospects of a crop. From Ewa to Honolulu, the plantations of McColgan, and Hālawa of Mr. Williams, are of limited capacity, and one square mile would include all the land cultivable in cane. Oahu then has only fourteen square miles of sugar cane land.

It would be difficult to find six square mile in Molokai, where sugar cane could be successfully cultivated. Lanai has but little, and that is confined to one valley with a precarious chance for water. Give it one square mile, and leave the remainder to sheep and goats for the benefit of Nāhu [W.M. Gibson's newspaper], Kahoolawe has not an acre adapted to the cultivation of any but grass, when it rains, which is rarely. Hurricanes of dust are from more abundant...

And if we give up all our best lands for sugar cane, what will become of the native populations? Will they become bonded slaves to cultivate their country for the benefit of others, or will they be displaced by Hill coolies or Chinese? In either case it would be ruin to them. As well to maintain the policy of exterminating the native race as advocate annexation and the conversion of all the agriculturalland of the island into sugar plantation!

As to the Pearl River reciprocity a matter, it is entirely with the King and the people. It will be time enough to discuss the subject when it assumes a practical shape. Until them, farewell to the subject and to "Virdis." Independence.

The author cited above was unaware of the upcoming development of water by James Campbell, when he had dug the first artesian well in 1876.

It is reported that the Williams mill at Hālawa burned down three times (The Evening Bulletin Industrial Edition, 1901:5) and the plantation proved to be more of a burden than it could...
The Pacific Commercial Advertiser
For Sale!
Halawa Sugar Plantation!
Situated in Ewa, 6 miles from Honolulu.

March 28, 1874 (page 3)
A rare chance for a good investment, for sale the entire plant of the Halawa Plantation, consisting of:
1 Sugar Mill, Roller, 20 x 36;
2 Clarifiers, 36 Coolers, 2 Centrifugal,
1 Steam Engine (4 horse power) and Boiler for Centrifugal,
1 A Large Boiler, 82 3-inch tubes;
1 Steam Engine, with Gearing complete’
1 Train of 4 Kettles,
1 Steam Strike Pan,

And all the necessary tools required to carry on the undertaking together with Working Oen, Bullock Carts, Implements, &c., &c.

And all other article required for a Sugar Plantation.
The above Machinery will be sold, either with or without the lease of the land, and the incoming crop, estimated at eighty tons/

For full particulars, apply to
J.R. Williams, Halawa
Or at J.I. Dowsett’s Office, Honolulu

Difficulties in the sugar industry in the Kingdom were the subject of many debates and requests from relief of tariffs on exports to the United States. On May 27, 1874, it was reported that planters presented their case to the legislature, and reference to closing down the Halawa plantation was made:

The Hawaiian Gazette
Address of the Planters to the Legislature.

May 27, 1874 (page 1)
Gentlemen: On behalf of the signers of the Petition which has caused your appointment, we beg to thank the Legislative assembly for so far granting us a hearing and for your prompt attention to us. We are here to assure you that nearly every Plantation in this Country is struggling for existence, and prepared to offer you, and to answer every questions that you may see
June 1890, it was announced that the O.R. & L. Co. operations had been extended throughout the district to the 'Ewa Mill. Local papers reported:

The first carload of freight to 'Ewa Plantation went over the OR&L Co.'s line yesterday (The Pacific Commercial Advertiser, 1890b).

On Wednesday last the track of the 'Ewa Plantation railway was completed to the harbor front, so the first train reached the wharf and several carloads of bananas were placed in scows and put on board the Australia (The Pacific Commercial Advertiser, 1890a).

By 1895, the tracks were extended through Honolulu to Wa'anae. The railway facilitated the continued development of the sugar plantations, ranching, and successive developments throughout the 'Ewa District up until 1947 (Conde and Best, 1973:279-280, 315-316). Figure 14, a portion of a map of O'ahu in 1902, includes an outline of various facets of land use across the 'Ewa District.

5.3.2 O'ahu Railway Line Extended to Hō'āe'ae (1888)

The Hawaiian Gazette
Over The Oahu Railway Line.

September 25, 1888 (page 5)

Just at sunrise on a glorious morning, such a day-break as only Hawaii can furnish, we started for Ewa to glance over the line and Ewa terminus of the first section of the projected railway. The grass, trees, flowers, fences, everything sparkled with the dew. A few tufts of white and fleecy clouds tipped the mountain summits; a cool air, fresh from the northern ocean, wafted down the valleys and lent an unstayed vigor to us and our horses. The blockade at Leiko causes a wide detour to School street, emphasizing the need of a new street continuing Beretania to Lili'u. After the roughness of the Palama road it was a delight to roll over the smooth hard road through Kaliihi and Moanalua.

On account of the grade the railway will run off makai from Palama, crossing Kaliihi-kai and Kahanui a good way below the road; but in Moanalua it will tap the center of that thriving and contented looking settlement. The whistle of the engine and roar of the cars will wake the echoes along the cliffs and palis of that old domain of Pele. A new life will be infused into our hitherto sleepy suburbs, and the ancient Hawaiian as he squats on the ground pounding his poi will gaze with astonishment at the speed of the iron horse. Will he realize that it is whirling him and his whole race into a more and more complex life?

At Moanalua the road will turn makai, running south and around the old volcanic crater. It will pass through a very dry and fertile section of country which, if irrigated, will produce abundant crops and support a considerable population. The salt industry might also be made a good deal of here and undoubtedly will be when there are facilities for transportation. The road will reach the shores of the lagoon in Halawai, and from this point on to Hoaæ will run along the shores, passing through a continuous and unbroken rice field. The tourists, however, did not turn off and follow the line of the road but continued on the Government road up the romantic and wonderful gorge which has been torn open in some remote past age by the waters of the Moana River. The efficient road supervisor under our Reform administration has made a splendid piece of work of this road; the grades have been improved, the rocks covered, and a carriage rolls through from one end to the other with hardly a jolt. Rising from the gorge our party soon reached the point separating Ewa from Honolulu, the highest point on the road. Here
the cool air coming down the valley in the morning reminded one of a colder clime and wraps were in demand. The recent rains have made the whole country green, which rendered it doubly beautiful. Only a short stay was made when the party dashed down the long hill of "Kapukakii" [Kapukakii]; everywhere along the road are visible the signs of improvement; lands in the past considered almost worthless are being fenced, wells are being sunk in the valleys in order that new land may be put under cultivation; the rice fields are green with waving rice, and in some places are already well headed out. Whirling on past the old Mission station at Waiawa and here turning southwest the party soon reached the Waipio residence of the Ii Estate. Mr. and Mrs. C. A. Brown were of the party and soon made us all at home. A pre-requisite at this place is a dash in the clear cold water of the bathing tank. The water is absolutely clear and pure, flowing in directly from an artesian well. It is protected from the wind, and a bath there is simply perfection. Most of our party evidently thought so, for instead of coming out when they were washed and cool, they sat in the water talking railroad! They might have been there to the present moment had it not been that a call from outside announced the arrival from the fields of a large number of watermelons. All hands now scrambled to see who should get dressed first and in a few minutes were engaged in devouring the most delicious watermelons that ever fell to mortal share. After this a half hour's rest in the delightful cool of the trees surrounding the residence, admiring the beautiful view across the waters of the bay, prepared us for a mount. Half a dozen of us took horse and rode out upon the peninsula which forms the makai extremity of the land of Waipio. This peninsula is divided into two sections separated from each other by a low and narrow isthmus; and from the mainland by a marshy flat now covered with rice fields. The inner section contains about four hundred acres, the outer about one thousand. On the west side lie the Waipio and Honolululoks, on the north-east side is the large body of water comprising the main portion of Pearl Harbor. The extreme point of the peninsula is directly opposite and in front of the mouth of the harbor. It is said that the United States Government has been in negotiation for the purchase of this extremity. It is the commanding point in the entire system of loughs. Upon the inner section Mr. Brown has a fine artesian well which has a magnificent flow of pure sweet water which will rise to an altitude of about thirty-four feet above the sea level. As the highest point of the peninsula is only about thirty feet, water can be made to flow all over it. The success of this well demonstrates that water can be obtained elsewhere on the peninsula. The shores are very much indented with little bays and inlets. They are lined with bluffs or fall gently off into sandy or pebbly beaches. In the little bays it is generally shallow; outside it is usually deep. The view from the north-east side is one beautiful almost beyond description. The whole Konahuanui range of mountains is in dew. Upon the morning we were there nearly every peak could be seen, for it was perfectly clear. The trade winds coming over the broad water gathers freshness and loses heat, fanning the cheeks with delicious coolness. Across the water the shores of the bay are very extremely varied, the low rice fields being broken by the densely wooded

Manana point. The soil along this shore is fertile and, in some pockets, quite deep. It is an interesting question as to where it could have come from, in view of the fact that it could never have received the mountain wash. There are most interesting points all along the shore; at several places are banks composed of immense masses of oyster shells, in some places nearly perfect, in others having the appearance of having been melted by heat, or possibly by the action of the water itself. Where these oyster shells could have come from is an interesting question. One of the younger members of the party very nearly wept at the thought of the great waste of oysters which was shown on this great bank. It was saddening to think that we could have none.

[Waipio-Wailea]. This peninsula is covered with a luxuriant growth containing many algarobas. When the railroad is finished no doubt this whole north-eastern shore will be occupied by residences; people will enjoy living out of town, when they can go and come from such a delightful point within an hour. It is to be hoped that prior to selling lots or permitting the erection of dwellings the whole peninsula may be laid out upon an artistic plan whereby the full effectiveness of its beautiful location and surroundings may be secured. After a long and careful inspection of this land and all of its surroundings till we were satiated with its beauties, the party returned to the Brown residence. Upon the way back, a fine view was had of the thousands of acres of splendid agricultural and grazing land lying west of the lagoon. Waipio, Hoaene and Honoluluu contain thousands of acres of land susceptible of fine cultivation and the production of abundant crops. Several thousands of acres of land lie below the level of artesian water flow and no doubt a series of series could be had by a marsh that now covers with rice fields. The inner section contains about four hundred acres, the outer about one thousand. On the west side lie the Waipio and Honolululoks, on the north-east side is the large body of water comprising the main portion of Pearl Harbor. The extreme point of the peninsula is directly opposite and in front of the mouth of the harbor. It is said that the United States Government has been in negotiation for the purchase of this extremity. It is the commanding point in the entire system of loughs. Upon the inner section Mr. Brown has a fine artesian well which has a magnificent flow of pure sweet water which will rise to an altitude of about thirty-four feet above the sea level. As the highest point of the peninsula is only about thirty feet, water can be made to flow all over it. The success of this well demonstrates that water can be obtained elsewhere on the peninsula. The shores are very much indented with little bays and inlets. They are lined with bluffs or fall gently off into sandy or pebbly beaches. In the little bays it is generally shallow; outside it is usually deep. The view from the north-east side is one beautiful almost beyond description. The whole Konahuanui range of mountains is in dew. Upon the morning we were there nearly every peak could be seen, for it was perfectly clear. The trade winds coming over the broad water gathers freshness and loses heat, fanning the cheeks with delicious coolness. Across the water the shores of the bay are very extremely varied, the low rice fields being broken by the densely wooded

5.3.3 Oahu Railway & Land Company Condemns Land for Railroad Operations

The Hawaiian Gazette

Notice of Intention to Take Land.

To All Whom It May Concern.

February 11, 1890 (page 10)

Take Notice That The Oahu Railway and Land Company, by virtue of the powers and authorities given to and vested in it by its Charter and by Act approved on the eleventh day of September, A. D. 1888, entitled "An Act to Authorize and Promote the Construction of Steam Railroads on the Island of
Oahu; and of every other power in anywise enabling it in this behalf, intends to take and use for the purposes of the Railway which it is authorized to construct, and works connected therewith, the pieces or parcels of land described as follows:

Beginning at the present end of the graded road-bed of the Oahu Railway in Manana, thence westerly along the located center line of said Railway as marked on the ground by stakes; 200 feet to the westerly boundary of a tract of land covered by Royal Patent 401, owned by the Oahu Railway and Land Co.; thence including a width of 40 feet, 20 feet on each side of said center line, through a tract covered by Grant 222, owned by Mrs. Addie K. Smith, leased to Apahu, 100 feet, containing an area of 11-100 acre; thence through a tract covered by Royal Patent 401, owned by the Oahu Railway and Land Co., leased to Apahu 91 feet, containing an area of 28-100 acre; thence through a tract covered by Royal Patents 23 and 190, owned by Alai, leased to Apahu, 200 feet, containing areas of 20-100 acre; thence through a tract covered by Royal Patent 401, owned by the Oahu Railway and Land Co., leased to Apahu 165 feet, containing an area of 15-100 acre; thence through a tract covered by Royal Patent 2343, owned by Kakea, leased to Apahu, 309 feet, containing an area of 28-100 acre; thence through a tract covered by Royal Patent 4475, held by the Trustees under the Will of the late Mrs. B. P. Bishop, leased to the See Wo Tai Co., 174 feet, containing an area of 16-100 acres; thence through a tract covered by Royal Patent 226, owned by Henry Wharton, leased to the See Wo Tai Co., 168 feet, containing an area of 16-100 acres; thence through a tract covered by Royal Patent 198, Land Commission Award 1696, Apana 3 to Namomoku, owner unknown, 85 feet, containing an area of 8-100 acres; thence through the tract covered by Royal Patent 179, Land Commission Award 5644 to Kamali, owned by Hono, 90 feet, containing an area of 8-100 acres; thence through the tract covered by Royal Patent 4475, 40 feet; thence through a tract covered by Royal Patent 198, Land Commission Award 1696, Apana 3 to Namomoku, owner unknown, 85 feet, containing an area of 8-100 acres; thence through the tract covered by Royal Patent 4475, 199 feet; thence through a tract covered by Royal Patent 5732, owned by Mrs. A. A. Brown, 318 feet; thence through part of the same tract leased to Ahoi, 1518 feet, containing an area of 1 39-100 acres; thence through the same tract 1076 feet; thence in the same tract through Loko Eo, leased to Ahoi, 305 feet; thence in the same tract to 2027 feet, taking from a tract covered by Royal Patent 1579, owned by Kupoliki, an area of 1-100 acres; thence through a tract covered by Royal Patent 821, owned by Mrs. A. A. Brown, leased to Sing Chong & Co., 28 feet containing an area of 3-100 acres; thence through three tracts covered respectively by Royal Patents 506, 526 and 5732, owned by Mrs. A. A. Brown, leased to Moe Sieu, 469 feet, containing an area of 43-100 acres, and taking form a tract covered by Royal Patent 6465, owned by Kam On, an area of 2-100 acres; thence through a tract covered by Royal Patent 818 to Humuhune; owner unknown, leased to Wo Sieu, 46 feet, containing an area of 4-100 acres; thence through a tract covered by Royal Patent 802, owned by Malamal, leased to Lin Tai, 112 feet, containing an area of 10-100 acres; thence through two tracts covered respectively by Land Commission Award 5506 and Royal Patent 5732, owned by Mrs. C. A. Brown, leased to Lin Tai, 428 feet, containing an area of 39-100 acres; thence through a tract covered by Royal Patent 804, owned by Koea, leased to Lin Tai, 75 feet, containing an area of 7-100 acres; thence through a tract covered by Royal Patent 5732, owned by Mrs. C. A. Brown, leased to Makui, 136 feet, containing an area of 113-100 acres; thence through a tract covered by Royal Patent 862, belonging to the estate of Hopo, leased to Makui, 156 feet, containing an area of 14-100 acres; thence through the tract covered by Grant 125, owned by Mrs. C. A. Brown, leased to Makui, 347 feet, containing an area of 32-100 acres; thence through a tract called Kapahi, held by the Trustees under the Will of the late Mrs. B. P. Bishop, leased to C. A. Brown, 92 feet, crossing Waikieke Creek, containing an area of 8-100 acres; thence through a tract covered by Royal Patent 5694, owned by Loo Ngaw, leased to the Tong Sun Wai Co., 388 feet, containing 36-100 acres; thence through a tract covered by Royal Patent 836, owned by Kaka, leased to the Tong Sun Wai Co., 148 feet, containing an area of 13-100 acres; thence through the tract covered by RP. 5694, 412 feet, containing an area of 38-100 acres; thence through Crown Land, 915 feet, containing an area of 84-100 acres; thence through a tract covered by Land Commission Award 5930, held by the trustees under the Will of the late Mrs. B. P. Bishop, 2165 feet, containing an area of 2 acres, a part being leased to M. P. Robinson; thence through a tract covered by Royal Patent 4490, owned by M. P. Robinson, 310 feet, containing an area of 3 12-100 acres, a part being leased to Goo Chun; thence through a tract covered by Royal Patent 2866, owned by J. I. Dowsett, 400 feet; thence through a tract of land covered by Royal Patent 6971, owned by James Campbell, leased to B. F. Dillingham, 3800 feet; thence in the same tract through land leased to Sing Chong & Co., 870 feet, containing an area of ...... acres; thence in the same tract through land leased to B. F. Dillingham, 2500 feet.

Oahu Railway & Land Company,
By W. R. Castle. Its President,
And W. G. Ashley, Its Secretary. Honolulu, Jan. 25, 1890.

5.3.4 Development of the O'ahu Railway & Land Company and Pearl City (1890)

Henry M. Whitney's "Tourists' Guide..." (1890) provides an overview of sugar plantation development in the 'Ewa District. At the time of writing, the O.R. & L. Co. had just opened train service passing from Honolulu to the 'Ewa Court House at Waialua (remaining track routes to be laid shortly thereafter). With the development of the rail system, businesses
The story of its origin...

Within the past year Hawaii has started in the footsteps of America by projecting a railroad around the island of Oahu, and actually perfecting within the period from April 1st, 1889, to January 1st, 1890, a well-equipped railroad in running order, extending from Honolulu along the southern shore of the island to a temporary terminus at Ewa Court House, a distance of twelve miles. It was five years ago that Mr. B. F. Dillingham advanced the idea of building a steam railroad that should carry freight and passengers, and conduct business on the most improved American methods. A hundred men told him his scheme was infeasible where one offered encouragement. He believed he was right, and so put forth every endeavor to secure a franchise, which was granted to him only after vigorous legislative opposition to the measure. The incorporation of the Oahu Railway and Land Company with a capital stock of $700,000 was the next step in the venture, but not an easy one by any means, as home capitalists were timid at that time, and few would believe that the soil of Oahu was worth developing to the extent of Mr. Dillingham’s plans. A small number of gentlemen, notable among whom was Hon. Mark P. Robinson, came forward at the right time and purchased enough stock and bonds to set the enterprise on foot. With all the disadvantages that remoteness from the manufacturing centers of America offered, [page 155] Mr. Dillingham undertook the contract of building and equipping the railroad. Rails were ordered in Germany, locomotives and cars in America, and ties in the home market; rights of way were amicably secured, surveyors defined the line of road, and grading commenced. The work was prosecuted with the utmost speed consistent with stability and safety, and there was hardly a day’s delay from the time grading commenced, in the spring of 1889, till September 4th following when the first steam passenger train, loaded with excursionists, left the Honolulu terminus, and covered a distance of half a mile. It was the initial train, and the day was Mr. Dillingham’s birthday, a period he had designated when he secured his franchise, exactly twelve months before, as the natal day of steam passenger traffic on Oahu. The little excursion was a success, as far as it went. On November 15th his Majesty’s birthday, the formal opening of the road took place. Trains ran to Halawa and back all day, carrying the public free. Following this event, which marked a significant epoch in the commercial history of this kingdom, the Oahu Railway & Land Company opened the doors of their commodious offices in the King Street depot for business.

**Oahu Railway and Land Co.**

**Colonization.**

It is patent to every resident of this Kingdom who is acquainted with Mr. Dillingham that his pet scheme is the industrial development of these islands through colonization. The railroad signaled the advancement of the scheme. It is now the purpose of the railroad company to bring out thrifty people from Europe and America who will take up land, cultivate the same, and establish their homes thereon. The railroad makes colonization possible, and is in itself an invitation to ranchers to engage in the different pursuits that are especially adapted to this soil and climate... [page 158]

**Developing the Country.**

Simultaneous with the commencement of business was the acquisition, by the O. R. & L. Co., of a fifty-year lease of the Honouliuli and Kahuku Ranch’s 60,000 acres, and the purchase of 10,000 head of cattle running thereon. This vast area, hitherto utilized as a stock range, is, under the manipulation of the railroad people, becoming one of the garden spots of the Kingdom. Two new corporations of sugar planters,—the Oahu plantation and Kahuku plantation—capitalized at $50,000 each, have each secured from the railroad leases of from 5,000 to 10,000 acres for sugar cultivation. Can is now growing on a part of the lands. These two great agricultural enterprises, the direct outgrowth of the railroad movement, confer valuable pecuniary benefits on the business men and mechanics of Honolulu. Artesian wells, yielding a bounteous flow of water, supply the means of irrigation, and make possible in that section of the island what almost everyone but the promoter of the railroad formerly believed to be impossible—the culture of sugar cane on a large scale. This abundance of water, which is obtained by the mere sinking of wells, has stimulated [page 156] other agricultural pursuits on the railroad’s lands. Ever since the day traffic was begun, the railroad people have been pushing forward in their good mission of banding the island with iron rails... [page 157]

**The Ewa Plantation.**

One of the direct results of the railroad enterprise is Ewa Plantation, now an accomplished fact. Over 5,000 acres of land have been leased, and a company organized with the following efficient officers, who are all experienced sugar men, thoroughly versed in all the ins and outs of sugar production on these islands: C. M. Cooke, President; J. B. Castle, Vice-President; E. D. Tenney, Secretary; J. B. Atherton, Treasurer; J. H. Paty, Auditor. The foregoing five officers constitute the Board of Directors. Castle & Cooke are agents, and William J. Lowrie is Manager. He has had a large experience as manager on plantations on Maui and brings to this work the energy and business capacity that are needed. Sixty-five acres are planted with seed cane. The best of Lahiaina top-seed is being used, which is considered much the best. Sixty men are now employed. Flames have been constructed connecting with those from Mark Robinson’s pumping works, which were already in operation when the company took possession. The young cane shows a marvelous growth for this season of the year. This seed will plant six hundred acres, and that area will be
seeded for the first crop, the planting to begin in August 1890, and next year it is expected that one thousand acres will be planted. The best Fowler & Son's steam plows have been ordered from Scotland. The McCandless Bros. are already at work putting down artesian wells and expect to have six wells in operation during 1890. The wells are ten inches in diameter, which is somewhat larger than is usual in this country. Carpenters are at work building laborers' houses, etc. A Baldwin locomotive, cars, rails, etc., are already ordered for the transportation of the cane. The pumping plant will be of the latest designs and the best patterns made. Five hundred workmen will be employed, and the planting of the first crop will be pushed forward as rapidly as possible. [page 165]

**Abundant water supply.**

One peculiarity of the Ewa Plantation which receives the unqualified endorsement of the manager is the source of the water supply. The main dependence will be artesian wells, and as the water does not naturally rise to the required height, the cost of pumping must be taken into account, but notwithstanding that it is claimed to be the best, it is as much as water can be had in sufficient quantities when it is most needed, which is not the case when the supply is from mountain streams; for when those streams are lowest is the particular time of the year when the most water is needed. Another thing in favor of the Ewa Plantation is the fact that one account of its low altitude and the corresponding warmth of its soils a crop of cane can be matured there in from six weeks to two months less time than in some places where cane is successfully raised on these islands.

From what we have learned from all sources we have greater faith than ever in the success of both the Oahu Railway and Land Company and the Ewa Plantation (Whitney, 1890:155-166).

### 5.3.5 Cholera Outbreak in 1895

Just as the 'Ewa Plantations at Honolulu and Waikiki were building up capacity in acreage and labor and Pearl City was growing into the envisioned hub of 'Ewa, a cholera epidemic broke out in Honolulu causing a scare in the countryside. Pearl City residents called for an end to all train traffic through the new city as described in the articles below:

**The Pacific Commercial Advertiser**

**Pearl City Objects to Trains.**

The Residents Want No Communication with the Capital. Contagion Greatly Feared. Guards Placed Along the Road—Citizens Will Have Good Supply of Beef—Mass Meeting Held Yesterday—Another Gathering This Morning—No Trains.

**September 10, 1895 (page 1)**

A very animated meeting of the citizens of Pearl City and vicinity was held in Ewa court house yesterday morning at 10 o'clock. There were over fifty persons present, representing different nationalities.

J. A. Hassinger of Pearl City acted as president.

The meeting was called to make regulations under which the citizens could act in the present cholera outbreak.

It was decided after a great deal of discussion to forbid people from Honolulu going into Pearl City.

The citizens present came to the conclusion that they did not care to have any more trains run through Pearl City and decided to allow the morning train on the railroad to run through Tuesday morning, returning some time during the day and remaining in Honolulu until further notice.

A petition was addressed to the Board of Health asking that a physician be sent to Pearl City to investigate into the health of the place. It was learned later that the physician asked for had been granted as in the case of Kaneohe, to which place Dr. Howard went yesterday.

It was decided to buy three bullocks to kill for meat. These were bought from Alex. Dowsett. Purchase of more will be attended to later, as the necessities of the case demand. A census of Pearl City and vicinity will be taken and the exact situation with respect to the condition of the people learned. Those who can afford it will have to buy their meat, while the poor will have the same given them free of charge. Forbidding catching of fish has told on the people and it is hoped the purchase of bullocks for fresh meat will obviate this difficulty to a great extent.

There will be another meeting of the citizens at 10 a.m., today. At that time it is thought the matter of allowing trains to run, will be reconsidered.

The railroad company has promised to run trains through the place at a rate of fifteen miles per hour.

At noon yesterday a guard was placed at Halawa on the Government road and another at Pauoa station. There will be three watches. No person from Honolulu will be allowed to enter Pearl City.

Back to Honolulu.

A conductor on the O.R.&L. railroad went to Waianae yesterday for the purpose of visiting with his family. Thinking nothing of the possibility of being ejected from the place, he walked boldly to his home. He was called upon later by a delegation and with his family was dispatched post haste to Honolulu,
Affairs At Pearl City – Trains Will Be Allowed To Go to Halawa Only.

September 11, 1895 (page 1)

Another meeting of the citizens was held in Ewa court hours yesterday morning for the purpose of modifying the stand taken on the previous day with respect to allowing trains from Honolulu to go through Pearl City. It had been decided to allow only one more train to go through on Tuesday morning until further notice. This precaution was taken to assure the people of the place of perfect freedom from the contamination existing in certain parts of the city of Honolulu.

Meeting was call to order by J.A. Hassing. After much discussion it was decided to allow trains from Honolulu to go as far as Halawa with coal. Other trains from Ewa plantation will meet there at the above named place and the coal will be transferred. No communication of Honolulu people with those of Pearl City is wanted.

Regarding the matter of limestone it was decided to let the plantation people do the digging and preparation for shipment to Honolulu. Trains from Honolulu will meet those from Ewa and the stone will be transferred as in the matter of coal.

A summons came for Mr. Hassing to go to Honolulu and the meeting adjourned to meet again at call.

The Hawaiian Star
Ewa Census – A Summary of the Work is Now Completed.

October 9, 1895

J.M. Ezer, Sam'l Hookano, A. Kauhi, J.L. Torbert and C.P. Iaukea, Committee, made a detailed census of Ewa District during the cholera scare. The work was neat and accurate. A book containing the names, sex, age, etc., of every person in the district has been prepared...

In the district there are 3049 souls distributed by nationalities as follows:


The greatest land division population is at Ewa plantation, 1167 in number. Of these there are 521 Japanese and 453 Chinese. Americans number 20 and

British 16. The next in population is Honoiluli, 264; and Waileke 212. Waimano is a close fourth with 209 persons. Other divisions fall below 200 inhabitants.

It will surprise many to know that so many Hawaiian live in Ewa district. The native population is divided as follows: Male adults, 254; female do., 214; children, 317....

5.3.6 Expansion of the O.R. & L. Company Rail and Developments

The Pacific Commercial Advertiser

Still "Onward" – Expansion of the Oahu Railway's Plant.
The Two New Locomotives Heavier than Old Ones–Improved Pattern-New Steel Laid-Curves Reduced–Bridges.

December 16, 1897 (page 1)

The broad and ceaseless energy shown in the improvement and extension of the plant of the business of the Oahu Railway and Land Company, is characteristic of the shrewd and tireless man at the head of the corporation. Mr. B.F. Dillingham’s remarkable enterprise has rather become a feature of the city, but new instances of it are being brought into evidence as each year rolls around. Those who knew the Oahu railway when it was on paper, and who saw it actually materialize, are scarce yet prepared to give full credit for what has been accomplished.

Within the past few months—since the construction of the line beyond Waianae has been in progress, improvements in the equipment and rolling stock have been made with a dash and expenditure that would seem almost reckless to the ultra-conservative, but those on the outside are beginning to see that each new movement is fully warranted before it is launched.

The bark Nuuanu brought the finest Baldwin locomotive that the company owns, and a duplicate of this new iron horse is being taken from the ship Spies. Both these new engines have six drivers as against four on the old machines. They are capable of greater speed and have more power that the old locomotives. They weigh 30 tons each. This size seems small when compared to broad gauge engines, but it remarkable as narrow gauge locomotives go. One of these new machines is already in use and the men who are familiar with such things are delighted with it. It was erected in the newly built machine shop of the company under the supervision of Master Mechanic Henry Roberts and was more than a success on the trial trip. A locomotive brought out for the Oahu plantation was also put together in the shop of the Railway Company. The railway’s engine has not yet been named. A number of the employees desire to honor the general manager in this case, but have not yet obtained his consent. He is partial to native names for the locomotives.
plantation [Waikele and vicinity] and the Waianae extension beyond or from Ewa. Much of what will develop out of the extension beyond Waianae, where the graders are now working by the hundreds is still private to Mr. Dillingham. Of course he expects not a little from the fertile territory near Waianae and beyond Kaena Point, in the vicinity of Waiau. Then it will be "On to Kahuku." But before that, according to those who claim to know all about plans for new sugar estate, there may be well under way still another great plantation maauka of Waiau... 

5.3.7 New Cemetery Needed Near Honolulu to Address Emerging Needs on O‘ahu

Growth of the immigrant population in Honolulu and Ewa was placing demands on cemetery needs. The cholera outbreak caused concern about hygiene and it was proposed that a new cemetery be developed in 'Ewa. Initially, 'Aiea proper was considered, but land in Hālawa, away from the larger population center and within easy access of the railway system, was decided upon. The following article published in local papers provides some background on the proposal.

The Hawaiian Star
The Proposed Cemetery – “God's Acre” To Be Placed at Aiea.
The Oahu Railway Company Make a Proposition to the Board of Health – Details of the Plan.

April 22, 1897 (page 1)

General Manager B.F. Dillingham, of the Oahu Railway & Land Company, has submitted to Dr. F.R. Day, representing the health department, a proposition for funeral transportation by rail to Aiea, where the proposed new city cemetery is to be located. Mr. Dillingham’s letter was read in open session by President Smith at the Board of Health meeting yesterday afternoon. Action was reserved on the proposition until later.

The General Manager’s proposal, which is subject to the approval of the Board of Directors of the railway, first asks for an agreement to be entered into by the cemetery association, Board of Health, or whoever receives authority from the Government to control the cemetery at Aiea, by which the Oahu railroad will be assured of the transportation business for a long term of years. This, Dillingham explains is to warrant the large outlay of capital necessary to meet the requirement of the contemplated undertaking.

In commenting upon this, President Smith argued that this proposition on the part of the railroad might work both ways. It seemed unfair that one road should have a monopoly on the business, while on the other hand it would not be a solid business proposition to the railway company unless they did secure this guarantee.

By the terms of the agreement, the Oahu railway company are to construct a...
double-ended switch at Aiea and add a branch track extending the same onto the cemetery lot, so that all special funeral trains or cars may reach the grounds, and thus require as a rule, no further expense for hearse or carriages.

Manager Dillingham expresses an opinion in his communication that a separate station at the Honolulu terminus would be most acceptable to the public. He also suggested that the railway company erect at the funeral station a small chapel and morgue, in order to meet the necessities of those who have little or no means to pay funeral expenses. It is also suggested that in the event of death of strangers in the city of limited means, living in small rooms or boarding houses the bodies could once be removed to the morgue and prepared for burial with the least possible expense. The same condition would apply to the poor people living in Honolulu. A non-secretary chapel would afford a convenient place for funeral service for persons of every creed and sect free of any expense to the friends or relatives of the deceased.

In speaking of the charge for the transportation from the "Funeral station" to the Aiea siding, Manager Dillingham fixed the minimum charge on body at one dollar. The fare for the round trip will be, first class, 70 cents, second class, 15 cents. A body and one person to attend would cost $1.70 first class; $1.45 second class. A combination car would probably be supplied with compartment for hearse, seating thirty people, for a cost of $10. The cemetery association would be expected to send a hearse to the Aiea siding and receive and take charge of the body from that point. A parlor car and hearse combined, constructed expressly for the purpose, with seating capacity for forty persons, would cost $20. A special train could be furnished for $33, with an extra charge of $10 for each car. Three hundred persons could be conveyed to and from the cemetery at this rate for $105.

A sketch of the proposed chapel and morgue accompanied Mr. Dillingham's letter. The site selected is just makai of the present station, facing on the prison road. Mr. Dillingham added that "it was possible to make a very attractive spot there by planting grass, flowers and high hedge to shut off the surroundings."

The members of the Health Department have been invited to call upon Mr. Dillingham at the station and secure further details from Mr. Dillingham.

Halawa To Be Selected – Mr. Smith’s Cemetery Site Is Approved.
Meeting of the Board of Health, Cabinet and Cemetery Association on the Subject Yesterday.

February 2, 1899 (page 1)

There was an important meeting in President Dole’s office at 3 o’clock yesterday afternoon on the subject of a new cemetery site. Present were the members of the cabinet, members of the board of health, and David Dayton, representing the Oahu Cemetery Association.

President Smith of the board of health introduced the subject. It was a disappointment that so many members of the cemetery association were out of town and could not be present.

The Halawa site was presented in all its details. It had the advantage of being a good distance from town, and the board of health had decided that its general sanitary advantages commended it as the most desirable site to be chosen. A map of the site was presented and looked over.

The necessity for immediate action in the matter was presented by Mr. Smith. Nuuanu, Makiki, and the Catholic cemetery on King street were becoming so crowded that they must positively be closed before long, except to persons owning lots there.

Although no conclusion was reached the discussion was favorable to the project urged by W.O. Smith of having the new cemetery at Halawa. Satisfactory arrangements have been made with the Oahu Railway to transport funeral parties to and from that place at a rate really below the cost of reaching Nuuanu cemetery.

The board of health is particularly unanimous in the Halawa idea and the cabinet concurs. The one member of the cemetery association present also agreed that it was the most tangible and wise proposal yet presented.

The next meeting of the three bodies for the further consideration of the scheme will probably be held next Wednesday afternoon.

Another Cemetery Site – Discussion Calls Forth Some Suggestions.
The Tract Proposed Lies Between Moanalua and Halawa, and is Near the Railway—Natural Advantages.

February 17, 1899 (page 1)

Editor Star: In the reports made of recent official discussions upon various propositions for a site for a new public cemetery, I have wondered at seeing no proposal to create such a cemetery at what seemed to me to be beyond all competition the best location of the purpose. Make your Cemetery on the great Pualoa plain [the Pearl Harbor Plain v. specifically the ill of Pualoa in Honouliuli Ahupu’a] or slope just beyond Moanalua, and immediately above the railway. Let it be at some point between Halawa Valley and Moanalua, say near the dividing fence of the two lands at the Pualoa station [situated on the Halawa Ahupu’a].

The only objection I have heard made to that site, and the only one I can...
conceive of is that a thin stratum of soils on the lands is underlaid by solid rock. But that rock is extremely soft tufa which any pick will break up. It really presents no serious obstacles to the digging of graves, although the labor can be easily facilitated by one or two blasts. A drill will go through the tufa like cheese.

This Pauleo tract presents various peculiar advantages, as follows:

- It is a very moderate distance from town, from five to seven miles from the center.
- It is close to the railway.
- It gives ample room for a cemetery for the coming city of at least 100,000 people which should have for that purpose a handsome park of at least 200 or even 500 acres.
- It is within easy reach of ample irrigation from artesian wells for the purpose of beautifying it.
- It includes rising and hilly ground including fine prospects of the sea, and, from the higher side of the city.

None of the other proposed sites embrace many of the advantages named, nor any of them in an equal degree. I do not see how anyone can hesitate for a moment at making this choice.

S.E. Bishop.

5.3.8 Development of the "Halawa Plantation" or Honolulu Plantation Company (1898-1947)

In 1898, a group of mainland businessmen joined local representatives in development of the Honolulu Plantation Company, making use of fee-simple and leasehold lands in Mānāna, Waimanalo, Wai‘alae, Kalama, ‘Aiea, Halawa with the proposed mill to be situated at ‘Aiea. The operation eventually took in a portion of Moanalua as well. Among the early setbacks in operation was the loss of lower elevation lands and access that occurred when the United States Military engaged in development of Pearl Harbor. In 1947, the lands and operation of the Honolulu Plantation were absorbed into the O‘ahu Sugar Company. In 1970, the larger Honolulu lands of the ‘Ewa Plantation were also absorbed into the O‘ahu Sugar Company which continued operations across portions of the ‘Ewa and Honolulu plantation lands through 1995.

5.3.8.1 Honolulu Sugar Company

The Halawa or Honolulu Plantation Company (later the Honolulu Sugar Company) was the last of the ‘Ewa District plantations to be developed. In April 1898, it was announced that a new plantation would be developed in the ‘Ewa District.

The Hawaiian Star
With American Capital – Big Plantation On This Island Planned.

Will Embrace Four Thousand Acres, Lying Between Pearl City and Honolulu—Will Begin This Summer.

April 1, 1898 (page 1)

Another sugar plantation is to be started on Oahu. It will be known as the Halawa plantation and will extend from Pearl City to a point within a very short distance of the city limits of Honolulu. American capital will launch the enterprise.

The promoter of the scheme is Elmer E. Paxton of San Francisco, who has had considerable assistance from B.F. Dillingham. Mr. Paxton endeavored to get away on the crowded S.S. Alameda, and after securing his accommodations, discovered that he could not complete his work before 3 o’clock on the morning following the departure of the boat. He took passage on the Klondike S.S. Capt. Otway for Victoria, and will then hurry over-land to San Francisco.

In that city reside the members of the syndicate which will start the new plantation. The money is already subscribed for the enterprise. The indications at present are that the soil will be prepared for the cane this summer.

Since Mr. Paxton came to Honolulu several weeks ago, he has been a very busy man. After making a thorough examination of the lands embracing the proposed new plantation, he at once set about to purchase and lease them. From the Oahu Railway Company, he secured 1,500 acres, and from other parties, including the Bishop Estate and S.M. Damon, he secured in the neighborhood of 2,500 acres of land, making the plantation embrace in all some 4,000 acres.

Mr. Paxton also contracted with the Railway Company for the hauling of freight. He attended to every detail connected with the enterprise and carried off with him a bundle of papers binding everything at this end. The financial arrangements will now be made in San Francisco. What the capitalization of the corporation will be could not be learned.

The plantation was incorporated in San Francisco in May 1898, with support from several investors, including Samuel Suessian who ran a successful marketing company (later a primary partner in the S&W canning corporation) and William Matson of a shipping interest. Island partners included several individuals in the island sugar business, and B.F. Dillingham and his O.R. & L. Co. The new sugar interest set its headquarters and mill in ‘Aiea (Figure 15) and took up the remaining open lands in ‘Ewa from Wai‘alae–Mānana (the area around Pearl City) to Halawa (leasehold lands of the Bernice Pauahi Bishop and Queen Emma estates), and later taking in leasehold lands of Moanalua (leasehold lands from S.M. Damon (Figure 16). Background of the Honolulu Sugar Company, along with its quest to improve access for transport of its product, is found in several articles as those cited below.
**Evening Bulletin**

New Sugar Company – San Francisco Capitalists who will Engage in Sugar Raising.

June 4, 1898 (page 1)

Articles of incorporation of the Honolulu Sugar Company were filed with the county clerk of San Francisco on the 27th. The capital stock is $900,000, of which $10,000 has been subscribed by each of the following directors: Nicholas Ohlandt, E. Ehrman, J.L. Koster, Frederick Tillmann Jr., Wm. Matson, Sam Sussman and A.F. Morrison. The company proposed to engage in the raising of sugar cane and manufacture of sugar in Honolulu and elsewhere.

**Evening Bulletin**

Honolulu Sugar Company. Its Plantation Will extend from Pearl City to Halawa. Incorporation at San Francisco was Noted in Bulletin of Saturday—Area, Elevation and Soil.

June 8, 1898 (page 1)

Last Saturday’s issue of this paper gave the news that articles of incorporation of the Honolulu Sugar Company were filed with the county clerk of San Francisco on May 27. The directors, each of whom subscribe $10,000 of the $900,000 capital stock, are: Nicholas Ohlandt, M. Ehrman, J.L. Koster, Frederick Tillmann Jr., Wm. Matson, Sam Sussman and A.F. Morrison.

It was stated, the information having come from a San Francisco paper, that the company proposes to engage in the raising of sugar cane and the manufacture or sugar in Honolulu and elsewhere. B.F. Dillingham, drawn into talk yesterday afternoon about the extension of the railway, mentioned with great satisfaction the floating of another plantation along the line. A question if it was the one reported in the Bulletin as above was answered affirmatively. Mr. Dillingham gave the following particulars:

“The land is around Pearl City and running in near Halawa. Its area is about four thousand acres. "It is dark, rich soil. Mr. Lowrie considers it on par with Ewa plantation soil. The land rises to an elevation of 650 feet above sea level.”

Mr. Dillingham is naturally proud of the fact that this is the fourth large plantation on this island to be called into being by his railway enterprise. It is for the Honolulu that Messrs. Low and Paxton went to the States. They are to be congratulated upon the success of their promotion thus far attained. Sugar cane will yet be seen waving its tassels against the very bounds of Honolulu.

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**Figure 15.** Sketch Showing Location of Present Government Road and Proposed Road through a portion of the Halawa and Aiea tracts crossing the lands of the Honolulu Sugar Co. Aiea, Oahu, HI (1899, Register Map No. 1966, D.L. and W.E.W., State Survey Division)
5.3.8.2 Purchase of Crown Lands in 'Aiea as part of the Plantation Development

As the Honolulu Plantation Company was developed, 'Aiea was chosen for the mill site and base of operations. When an announcement was made that some 90 acres of Crown Land would be sold at 'Aiea, the partners won the bid and received Land Patent Grant No. 4270 (Figure 17). The notice of sale was published local papers, including the one below:

The Pacific Commercial Advertiser
By Authority – Public Lands Notice.

August 13, 1898 (page 2)

On Saturday, August 13, at 12 o’clock noon, at the front entrance of the Judiciary Building, Honolulu, will be sold at Public Auction a tract of land at Aiea, Kona [Iwa], Oahu, containing a total of 98 acres, lying on both sides of the present main road.

The Government main road to the width of 80 feet is reserved from this sale, and the reservation is further made for a road of 50 feet width from the main road to the upper land of Aiea over a line to be approved by the Government.

Upset price, $1,000.00 Cash U.S. Gold.
J.F. Brown, Agent of Public Lands.

5.3.8.3 Land Condemnation Requested for Road Through Honolulu Plantation Company on Hālawa-'Aiea Lands in Vicinity of Sugar Mill

The Hawaiian Star

The New Railway Matter - Cabinet will Consider it on Friday.
Attorney W.O. Smith to Present Petition for Charter – Mr. Thurston Against – Minister King at Work.

June 13, 1899 (page 1)

...The attorney-general recommended that a board be appointed to investigate the merits of a petition of the Honolulu Sugary company to have the road at Aiea, through its plantation, changed. It is desired to move the driveway further makai so as to run directly through the cane estate. There has been some objection to the project, and an official inquiry into it deemed advisable.

Recommendation adopted and the commission will be appointed by the President.
Figure 17. Portion of Aiea Ahupuaa Conveyed through Land Patent grant No. 4270 to the Honolulu Sugar Company, with Outline of the Proposed Government Road Realignment (1898, Register Map No. 1944, M.D. Monsarrat)

**The Hawaiian Star**

In the Matter of a New Road from Halawa to Aiea and of the Old Road from Halawa to Aiea, situate in Ewa, Island of Oahu.

Notice.

June 20, 1899 (page 1)

Notice is hereby given that upon Wednesday, June 21, A.D. 1899, at 10 o’clock a.m., a jury duly drawn and subpoenaed “In the matter of a new road from Halawa to Aiea and of the Old Government road from Halawa to Aiea, situate in Ewa, Island of Oahu,” will meet at the office of the Marshal, in Honolulu, Oahu, and thence adjourn to the site of the proposal roadway, there to inspect and examine such locality and ascertain all facts as may have a bearing on the matter.

All persons in any way whatsoever concerned in the above mentioned roadway are there for notified to be present at such time and place, there to be heard by the jury in relation to the proposed roadway.

A.M. Brown, Marshal, Republic of Hawaii.

On June 24, 1899, *The Hawaiian Star* reported that “The jury on the new road at Aiea met this morning and made its verdict. It is recommended to the Minister of the Interior that the new road be opened and the old one closed” (1899b:1). Additional information on the right of way was published on August 11, 1899, cited below:

**The Pacific Commercial Advertiser**

For Right Of Way.


August 11, 1899 (page 5)

Deputy Marshal Hitchcock has made return of service of summons in the case of the Honolulu Sugar Company against the Republic of Hawaii, a petition for condemnation of certain rights of way. The corporation desires to acquire certain private rights-of-way across certain land situated at Waimalu, Island of Oahu, for a plantation railway and branches thereto, and for water pipes for agricultural and manufacturing purposes and is unable to agree with the said Republic of Hawaii across whose lands it is desired to acquire such rights-of-way. These are described as follows:

1. The right-of-way for main railway line down the side of the Pali on the southeast side of Waimalu creek; thence across the valley to the boundary of the Government land at Waimalu creek. Total length, 1,565 feet; width, 40 feet; total area, 1.20 acres.

2. Right-of-way for branch railway line, the first leaving the main line of the plantation railway near the foot of said Pali, and running in a northeasterly direction to the boundary of Grant 715, entering the Government land again at the boundary of Grant 715 and nearer Waimalu creek; thence running in a southerly direction across the main line of the railway to the boundary of the Government land at Waimalu creek. Total length, 985 feet; width, 40 feet; total area, 90-100 of an acre.

3. Right-of-way for two pipe lines A and B, entering the Government land at Waimalu creek, easterly of the Waimalu pumping station of the plantation; thence running in an easterly direction up the Pali to the boundary of the
5.3.8.4 Honolulu Sugar Plantation becomes the Honolulu Sugar Company (1900)

The Pacific Commercial Advertiser
Gigantic Deal of Honolulu Sugar Co.
Capital Raised to Five Million Dollars – Details Arranged – Most of Stock Already Subscribed for and Only Small Amount for Market. June 29, 1900 (page 3)

While here, Mr. Ohlandt gave out some interesting information concerning the recent action of the directorate of the Honolulu Sugar Company in San Francisco, which has resulted in the transfer of all the property owned in the name of the Honolulu Sugar Company, with a capitalization of $900,000 to Honolulu Plantation Company, with a capitalization of $5,000,000. The facts of the transaction are substantially as follows:

The company was organized with a capital for $900,000, divided into 9,000 shares of the par value of $100 each. Out of this stock the company paid 1,500, equivalent to $150,000, and $3,000 cash for the procurement of leases, which are most paid up for a period of fifteen years. The remaining $7,300,000 had had practically all been spent in the development of the company’s properties, by the end of September of last year.

The original intention of the promoters was to establish a plantation which would have an annual yield of 1,000 tons, but in the acquirement of new lands it is confidently expected that this will enable the plantation to yield in the course of three years, in the neighborhood of 25,000 tons annually. This enlargement of the plantation has necessitated increased facilities in the way of mills, pumps and railroad, and will requires at least three quarters of a million dollars more to carry the plantation over to its producing stages.

The problem confronting the directors was either to levy assessments or to form a new company with a stock sufficiently large so that the property could be sold to such a new company for sufficient amount in stock which, when eventually distributed to the original stock holders would give them what might be deemed to be a fair value of their present holdings. It was planned at the same time that this would leave sufficient stock in the treasury of the new company, as a working capital, which, when sold would raise enough money to carry the plantation along until the time when it would be able to produce an income for itself...

The Honolulu plantation began with 9,000 acres of land in the District of Ewa, most of which was suitable for cane cultivation. The estate now embraces in the neighborhood of 6,000 acres. It is said that an abundant supply of water has been developed. Two big pumping plants having an aggregate capacity of 29,000,000 gallons daily are now in operation, and another plant of 9,000,000 gallons capacity will be running very shortly. Three more plants have been ordered with an aggregate capacity of 54,000,000 gallons, making a total of 92,000,000 gallons of water daily already planned for. A system of reservoirs along the upper portion of the land provides irrigation at a very economical cost.

Manager Low now has growing for the crop of 1901 some 1,500 acres. He is now planting another 1,500 acres. He estimated his first crop at 15,000 tons, and the 1902 crop at 18,000 tons, MBI machinery and buildings are on the
5.3.8.5 Floods Impact Plantation and Kill Naone

The Pacific Commercial Advertiser

Destruction In The Big Storm
Honolulu Plantation Engineer May Have Been Drowned – Minute Guns
Heard Off Pearl Harbor May Mean Ship on Reef
Rain Swells the Streams and the City is Flooded in Many Districts Causing
Heavy Losses to Owners.

October 17, 1900 (page 1)

“While in the pit the flood came roaring in and they struggled for their lives. Two of the air valves exploded. When the first valve went off Smith stayed on, but when the second exploded he broke for the top. Then came the water and all made desperate effort to reach the surface.

“Naone was not seen afterward and his helper says that he did not reach the stairway. Engineer Smith thinks Naone got out before he did. We cannot find him however at his home or anywhere. We can make no search until tomorrow. Our damage to the pumps will be $2,000. It will be at least a week or ten days before we can work the pumps again but we will have lots of water as the storm had taken care of that...”[Article continues with details of flooding in Honolulu]

The Pacific Commercial Advertiser

Naone’s Body Found.

Plantation Engineer was Drowned in Pump Pit at Aiea.

October 22, 1900 (page 6)

The body of Naone, the engineer of the Honolulu plantation who was drowned in the pump pit during the freshet last Tuesday evening, was found by the searchers at an early hour Saturday morning in an upright position and badly decomposed. When the water was pumped out of the shaft almost to the bottom the body suddenly shot up into view. The arms were extended in a manner to indicate that the engineer attempted to swim and save his life. From the appearance of the machinery it is believed that he was stunned by the flowing out of two valves. The searchers were compelled to make hast in bringing the body to the surface on account of its condition.

5.3.8.6 The Honolulu Plantation Ready to Begin Processing Its Sugar (1901)

The Pacific Commercial Advertiser

Inspect Mills.
Capitalists Travel by a Special Train – New Machinery In Working Order.

The Mill at Honolulu Plantation the Object of Excursion Yesterday.

February 23, 1901 (pages 1-2)

“While in the pit the flood came roaring in and they struggled for their lives. Two of the air valves exploded. When the first valve went off Smith stayed on, but when the second exploded he broke for the top. Then came the water and all made desperate effort to reach the surface.

“Naone was not seen afterward and his helper says that he did not reach the stairway. Engineer Smith thinks Naone got out before he did. We cannot find him however at his home or anywhere. We can make no search until tomorrow. Our damage to the pumps will be $2,000. It will be at least a week or ten days before we can work the pumps again but we will have lots of water as the storm had taken care of that...”[Article continues with details of flooding in Honolulu]

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The Mill at Honolulu Plantation the Object of Excursion Yesterday.

February 23, 1901 (pages 1-2)

A party of fifty guests, at the invitation of Mr. and Mrs. B.F. Dillingham, enjoyed a delightful excursion by special train yesterday through the plantations and around the Oahu Railway, through the exquisite panorama of towering mountains and flashing vistas of purple sea for which that route is famed. Honolulu Oahu and Ewa plantations were visited and late in the afternoon the party arrived at Waialua, where they were entertained at the Haleiwa hotel last night. They will return this morning to Honolulu.

Among the party were a number of San Francisco capitalists, who it is
understood are contemplating investments in the Islands, and their visit to the thriving plantations favorably impressed them, as to the future of the sugar industry.

At Honolulu plantation the special train drew up beside the great new mill and J.A. Low, manager of the plantation, conducted his visitors through the big building, explaining the process of sugar-making and pointing out the modern improvements and innovations which have recently been instituted.

The site of the new mill covers nearly three acres, and under the new process the management hopes to reduce to the minimum the waste of the sugar, the latest inventions having been adopted throughout the vast system of machinery. From the time the cane is fed into the crusher until the sugar falls in grains from the crystallizers into the sacks, a thorough study of the process has been made and carried out with an eye to the best possible economy. A 10 per cent waste in molasses will be avoided and it is expected that a percentage of 92 will be obtained in pure sugar. An improved system of centrifugal for the crystallization of the syrup has been instituted. There are twenty of them to receive the syrup from the clarifying pans, each having velocity of from 1,200 to 1,400 revolutions per minute, the entire system being capable, of taking off 200 tons per day.

In the boiler house there are six 250 horse power Heine boilers, equipped with automatic fuel feeders, the trash from the crushed cane being utilized and entirely supplying the fuel for the running of the big system of machinery. In the boiling house, where the cane juice is boiled into sugar, there are three 7,000-gallon Kibby pans to receive the raw syrup, and also Lily evaporators. Under the old system open clarifiers were used in liming and boiling. The new machinery has a compressed air process and the syrup is continually stirred by an arrangement of automatic blades. A novel and much improved feature of the crystallizing plant is the method of supplying power. The numerous and dangerous belts are all done away with and a neat substitution of clutches serves the purpose, leaving the passageway free from obstruction. The centrifugals are driven by water power derived from two Risdon high-duty pumping engines, the first of the type, to be used in the Hawaiian Islands.

The crushing department has a 34x78 eleven-roller mill, all connected and driven by one engine, and the filtering process has been improved according to the latest equipments.

Automatic conveyors and machines for drying the sugar before bagging facilitate the shipping of the sugar, and the truck railroad is being completed in the shipping room, to be ready for operation early next week.

Steel has been used in the construction of the building throughout and the building as well as the machinery within it has been constructed entirely by the Risdon Iron Works. A self-supporting stack, 150 feet high from a 30-foot base, the invention of Gillet Hersog of Milwaukee, is the only stack without guide ropes on the Islands. It is brick-lined and is 13 ½ feet in diameter, being anchored with long bolts.

The installing of the new machinery has caused some delay, but the big structure and the mill within it have gone up with astonishing rapidity. The mill site covers 42,000 square feet and the machinery has been so arranged that the plant can be doubled in the same building area without displacing any of the present structures. Mr. Low expects the crushers to be at work next week and is confident that the new mill is capable of turning out from 150 to 200 tons per day.

Mr. Low says there is an unusually good crop of cane, the stalks averaging twenty feet in height, and there being very little "lala" [branching] growth. He expects [continued on page 2] [page 1] a large yield of from 11 to 12 tons per acre.

Large warehouses are being built for the reception of the sugar and are being fitted with conveyors for stacking and conveying.

After Mr. Dillingham and his party had inspected the new mill Mr. Low invited them to board a plantation train and conducted them to the pumping station. There are three new pumping plants, of a capacity of nine, seven and twenty million gallons of water per day.

From Honolulu plantation the excursion party proceeded to the Oahu plantation and mills and thence to the Oahu pumping station, where there are three pumps of a capacity of twenty million gallons of water per day, sending forth a larger stream of water than any other pumping station in operation in the world.

The excursion was resumed and a dainty repast was served to the guests at the luncheon hour in the luxurious observation car of the train, while the panoramic beauties of the picturesque route towards Waialua were enjoyed...

Among the party were Mr. and Mrs. Goodfellow of San Francisco, Mr. and Mrs. Albert Raas, Mr. and Mrs. Phelps, Mr. and Mrs. A.W. Wilson, Mr. E.D. Page, Mr. and Mrs. L.A. Thurston, Captain and Mrs. Matson and little daughter, Mr. George Tourny, Miss Delia Mills, Mr. and Mrs. Judge Frear, Mr. M. P. Robinson, Mr. W.R. Castle, Mr. J.A. Buck of San Francisco, Mr. S. Sussman, Mr. J.W. Von Berger, Mr. H.K. Belden, Mr. and Mrs. John Lloyd, Mr. and Mrs. W.S. Miller, Mr. and Mrs. J.G. Allen, Mr. F.J. Devlin, Mr. A.E. Lacy, Mr. and Mrs. G.L. Edwards, Mr. E.R. Swain of San Francisco, Mr. Stanford Sachs of San Francisco, and Mr. and Mrs. B. F. Dillingham and Mr. Walter Dillingham.
5.3.8.7 Description of the Honolulu Plantation Company Startup and Operations

Honolulu Plantation Co.
One of Oahu’s New Plantations

November 30, 1901 (pages 5-6)

The Honolulu Plantation Company, being organized and incorporated in the State of California is practically a California corporation, although considerable of the stock is held in the Eastern States. But little stock is held in the Hawaiian Islands. Its lands are chiefly in the District of Ewa, Island of Oahu, but extend to the outskirts of the city of Honolulu.

In this plantation, like most of the larger estates in the islands, history has repeated itself. The lands of the Honolulu Plantation Company were farmed and made up one of the original sugar industries of the islands in the ’50s and ’60s; the lands of Hālawa and Waimānu were cultivated in sugar cane and known as the “Sugar Plantation of J. R. Williams.” [Figure 18] The mill consisted of large sheds and a one-story wooden structure in which were a two-roller crusher driven by horse-power and open pots for the boiling of the syrups.

This mill at that time was a fair sample of the primitive modes of the manufacture of sugar. However, the lands were cultivated in sugar cane and were very productive. The sugar cane was hauled to the mill with bullock carts. The cane was raised on the low-lands and in the valleys.

The mill burned down on three different occasions and finally the cultivation of sugar cane was abandoned. The property, however, after being used for cattle ranches for a period of some twenty-five years was again taken up for the cultivation of sugar cane.

The success of the Ewa plantation and the Oahu plantation, and the advances and improvements made in hydraulic machinery through the modern high-duty, up-to-date, triple expansion pumps, which enabled the irrigation of higher lands at such figures as would permit of the cultivation of cane, were the conditions which gave full encouragement to the organization of the Honolulu Plantation Company.

The lands of this company stretch out over a distance of some twelve miles, the property being a long, narrow belt. Situated amidst the foothills of mountains, the lands rise abruptly and do not show large, wide and open spreading fields. Some of the property is broken by gulches, but aside from this the soils are of the same nature as those of the Ewa plantation and Oahu plantation, and are as equally productive. The engineering work in the organization and development of the plantation has been exceedingly difficult, but the work that has been done is of a permanent nature. None of the large works but shows the permanency of the work. The property today is not a fully developed plantation. The plantation has been in operation just three years last September. However, the improvements are practically finished. The plantation has its full complement of railroads complete. Its mill plant and rolling-stock are suited to the plantation when under full development. The irrigation and pumping plants as now installed are equal to serving 5000 acres of cane lands.

Figure 18. View of Honolulu Plantation Complex (The Evening Bulletin Industrial Edition (3rd ed.), 1901:4)

Lands—The property of the plantation consists of about 9000 acres of lands lying below a 650-foot contour above sea level. Most of the property is situate above the Oahu Railway & Land Company’s railroad track, which skirts the waterfront of Pearl Harbor. However, there is an area of some 1800 acres below the Oahu Railway & Land Company’s track, which lies below a 25-foot contour, and which is irrigated at a very economical outlay. About 6500 acres of this total area is available for cane land and is situated below the 480-foot contour, this being the highest elevation which the company contemplates pumping to. The average pump lift for the total 6500 acres of cane land is 190 feet, this being the actual average of the fields under irrigation and contemplation. There are still 1500 acres of land to be developed between a 280 and 500-foot contour, the present property only having been developed to a 280-foot pump lift. Contracts will be let for two large fly-wheel, high-duty,
triple-expansion pumps to bring this further area of 1500 acres under the system of irrigation. The acreage under cultivation and planted is 5000 acres.

Cane.—The variety of cane known as Lahaina is being cultivated almost entirely, although the Yellow Caledonia is being experimented with for the higher elevations, more especially for the upper valley lands, where it is hoped this variety of cane can be grown without irrigation, there being more or less seepage in the valleys and this being a variety of cane that is more equal to droughts than that of Lahaina. There are 3000 acres of growing plant and ratoon cane and 2000 acres of young plant planted at this time. This property is situated more particularly around the east loch of Pearl Harbor. The cane on this plantation matures in from fifteen to twenty-one months according to the elevation of the lands. The higher lands require a longer period than the low lands, the temperature and conditions varying considerably. The yields, however, do not differ, the higher lands requiring at least four months more than the low lands to mature the cane.

Cultivation.—Under the heading of “cultivation,” the method is much like that of adjoining plantations, except that in actual plowing the ground (the soils being virgin) is not turned up to such a depth as is done on older plantations. The soil is plowed with the Fowler steam plows, and knifed with a tool like that of a cultivator, each fork or knife cutting through the soil to a depth of thirty-six inches, and in this manner breaking up the under soil. It is then plowed and turned over to a depth of from twenty to twenty-two inches. The depth of the soil on the lands of this plantation is from three to ten feet. The character of the soil on the lower lands of this plantation differs some from that of the lowlands. The soil of the lowlands is of a brownish abode nature, while that of the uplands and foothills is what is known as red soil. The latter are, if anything, more productive and alluvial; they are easier to farm and cultivated with less labor than the lower black and abode soils.

This company, in addition to the steam plowing, requires some mule plowing. All the lands are furrowed with mule plows after having been steam-plowed. This necessitates a great number of mules, there being some 180 head of mules and forty head of horses required to carry on the general work of planting and harvesting crops and hauling of supplies. The mode of cultivation is like that of all irrigating plantations. The cane is cultivated entirely by a system of irrigation, no dependence being put on rainfalls. The total areas are brought under a system of irrigation by large and extensive ditch lines, which include trestles and steel flumes, heavy steel pipe lines which form the discharges from the several pumping plants, and which carry the water across the deeper gulches in the shape of inverted siphons. Where the head is less great the California redwood stay pipes are in use, there being several of these pipes installed in the irrigation works of this company. The total mileage of main ditches, flumes and pipe lines is equal to 373 miles, and is substantially built.

Railroads.—This company has a system of railroad tracks built in a most substantial manner; it being necessary to construct many large trestles and cross the gulches to join the property. This work is equal to that of any in the islands. In fact, the engineering has been most difficult in some instances. The road is laid with 35-pound rails. The alignment of the road is such that it permits large trainloads of coal-laden cars being hauled to the pumping stations and likewise long trains of cars loaded with cane to the mill. This work has been completed for a total of thirty-one miles of railroads and trestles. The rolling stock of the company consists of four large Baldwin locomotives from twenty to sixty-six tons weight, and some 500 cane cars of one and one-half tons weight and an average capacity of six tons each. The company also has some five miles of portable track of 20-pound rails in 16-foot sections. This track is used for harvesting crops and for the planting of the same. It is laid through the fields over the rough surface without preparation and the cars are hauled on the same by mules from and to the main tracks. The whole work of transportation is done by a system of railroad work.

Labor.—Unskilled Labor: The laborers employed on this plantation are made up of Japanese, Chinese, Portuguese, Porto Ricans, Spaniards and Italians.

The skilled labor, exclusive of manager and superintendent numbers about 128; average pay, $81.75 per man per month. Unskilled labor numbers about 1397; average pay, $20 per month per man. The skilled labor, not including the salary of the management, but including house room and fuel and water in many instances, while the unskilled labor, in addition to an average salary of $20 per month for twenty-six days labor differs some from that of the lowlands.

Co-operative Contracts.—This company, like all of the adjoining plantations on this island, are cultivating lands under what is known as “co-operative contracts” with the different laboring classes of people employed on the plantation, and more particularly described as a profit-sharing contract. The lands of the plantation once plowed and planted are laid off in fields of areas from fifty to one hundred acres each and given out to small companies of laborers to care for up to the time of maturity. These contracts are co-operative whereby the laborer profits alike with the plantation by the increased yields which undoubtedly result from proper and attentive cultivation and irrigation. The contract is one whereby the laborers are given a small tract of land and a house situate immediate or close by their respective fields and are furnished with water and fuel. The contractor undertakes to irrigate and cultivate the cane, cut and load the same, for which he is paid rates varying from $1.25 to $1.40 per ton of cane, according to general character and aspect of soils, and is advanced from month to month for living purposes the...
Reservoirs—This company has some 290,000,000 gallons of reservoir capacity developed. There are also some storage ditches which lead back into the gulches, bringing water out from the mountains in times of freshets. The company is now prospecting and entering upon the work of developing water boxes, tunnels and drains in the mountains with the idea of bringing it out over the higher lands. No special development has been made as yet, but the prospects are very good for considerable water being developed in this manner.

General Works.—The general works are situated at Aiea and consist of a large mill plant of the most modern machinery and a mill building of iron structure. The whole building is of concrete, stone and iron, there being no inflammable material except in the sugar house, where there are a few gallery floors of wood. There is a large reservoir of some 15,000,000 gallons capacity situated on a hillside above the mill, which is supplied with water from a pumping plant situated a mile distant from the mill plant, and from which reservoir the mill draws the water for the manufacture of its sugar. There is a large fire line laid in connection with this pipe line from the reservoir, which terminates in the most modern fire hydrants at all points of the mill building and shops. This fire line extends to other parts of the works immediately adjoining the mill, as well as to the stables, store, hotel and private dwellings occupied by families of skilled laborers.

Mill Machinery.—The machinery of this mill is the most modern in the Hawaiian Islands, if not of the sugar-growing sections of the world. The building and mill were constructed by the Risdon Iron Works Company of San Francisco. The guaranteed capacity of the mill is 150 tons of sugar per diem of twenty-four hours. This quantity, however, has been exceeded and the mill plant today is considered to be equal to some 180 tons of dried sugar per twenty-four hours. In planning the situation and arrangement of machinery due consideration has been given to a possible further enlargement or development of the plant, and with the additions of (page 5) certain portions of machinery in the boiling house at a very limited outlay the plant can be brought up to a capacity of 200 tons of dried sugar per twenty-four hours. The mill proper is composed of three sets of three rollers each of 24 x 78 inches, and a set of two rollers forming the crusher, of 32 x 78 inches, all directly driven from one large single Corliss engine, with the necessary gear. The boiler plant consists of water tubular Heine boilers and American economizers. The records achieved in this boiler plan far surpass the expectations of the engineers who planned the construction. From numerous tests that have been made to ascertain the work which these boilers were performing it was found that the Heine tubular boiler was surpassing any of the old multi-tubular type by nearly 25 per cent. In other words, the evaporation as shown in these tests made on the several Heine boilers installed in this plant has been equal to the evaporation of 3.4 pounds of water to one pound of bagasse, equal to and at a temperature of 212 degrees Fahrenheit, the bagasse showing an average percentage of from 35 to 48 per cent of moisture, with about 1 1/2 to 4 per cent of sucrose therein contained.

The contemplated horsepower for the required machinery of this size plant being figured at 1500, there are six 250-horsepower boilers in this plant. The working, however, of the plant has been confined to five boilers and sometimes four. These boilers have the Risdon Iron Works Company’s automatic self-feeders and the usual trash-burning furnace of sixty inches in width, with stepladder grates and horizontal grate on bottom. The mill is supplied with cane from cars which are unloaded by the Gregg patent unloading device directly into the carrier. The trash is conveyed from the engine or mill room into the boiler portion of the said house, and there fed directly by the aforementioned automatic feeders to the boilers, the surplus trash being dropped through to the lower floor, where it is baled and used at the pumping stations. In this house space has been left for the installation of further boilers.
In the boiling and sugar house, which is a large, airy and lofty building, with a tower-like apartment in the center, and surrounded by galleries, the most modern machinery to be found in the manufacture of sugar is installed. Space also has been left for the doubling up of the plant, it being possible to install further machinery without alterations whatever to the building. This building differs considerably from other mill plants in the islands in the special arrangement of the floors and the machinery, it being noticed that considerable study and forethought were given to the said arrangement for the particular purpose of furnishing light and operating the various machines under the immediate control at all times of the sugar boiler in charge.

The machinery in this sugar house consists of a quadruple effect of the Lillie type; vacuum pans made by the Kilby Manufacturing Company; large crystallizers after the Dr. Bock pattern, made by the Risdon Iron Works Company; two large single fly-wheel Corliss valve-gear hydraulic pumps, equal to a working head of 200 pounds, which supply power for the motor-driven centrifugals; sixteen 42-inch Watson-Laidlaw water-driven centrifugals working at some 1200 revolutions per minute; sugar conveyors and elevators taking all the sugars of both high and low grades from the centrifugals without labor. The method of manufacture in this mill, like most of the modern mills, is that of making of molasses sugars, turning out "A" grade only, the low grades being remelted and worked in with the first grades. This building, like most of the modern and newer mills, includes a large sugar room and shipping shed, wherein the sugars are loaded immediately on the cars of the Oahu Railway & Land Company and then transported to the warehouses in Honolulu or loaded on vessels. The steel structure and material for this building came from the Gillett-Herzog Company of Milwaukee, the Risdon Iron Works Company being the contractors. The building was erected and put together by them, the mill building and the arrangement being designed by the Risdon Iron Works Company.

**Machine Shops**—In addition to the mill plant there is also a separate coal-burning plant, which furnishes the power for the machine shop and electrical department when the mill is not in operation and developing steam from bagasse. The electrical machinery consists of a marine type direct-connected dynamo of the General Electric Company, pattern of 500 lights, arc and incandescent, and a small Ball engine, with belt-driven dynamo of 300-light capacity as supplementary. From this engine the power of the machine shop is derived as well, and from the motor in the blacksmith and carpenter shop building, situated some 250 yards distant, power is had for wood-working and blacksmithing tools in these shops. In addition to these works there are warehouses and store rooms as well as the main office situate in the vicinity of the mill building.

**Pumping Plants**—There are also three pumping stations in operation, two situate in Ha'wawa valley. No. 1 station consists of a Risdon triple-expansion, modern, up-to-date Corliss valve-gear pumping engine delivering 20,000,000 gallons per twenty-four hours to a 65-foot head, and in No. 3 station, situate some 500 yards distant from No. 1 station, there are two high-duty pumps, one triple Corliss valve-gear engine working to a 300-foot head and one to a 190-foot head, the former delivering 9,000,000 gallons per twenty-four hours and the latter 7,000,000 gallons per twenty-four hours. Therefore from this one valley there are some 36,000,000 gallons of water being drawn daily from the artesian system. Distant from there pump sites, in what is known as the Waimalu valley, some three miles, there is a further pumping station, classes as No. 2 pumping plant, which consists of one 11,500,000-gallon and one 7,500,000-gallon triple Corliss pumping engine, both engines being placed in a pit some forty feet below the surface of the ground, with the boilers on the surface above. These engines, like the others, were made by the Risdon Iron Works Company of San Francisco, and are high-duty, triple-expansion, horizontal Corliss valve-gear pumps, with all steam-saving devices. In the No. 2 and No. 3 pumping stations the Heine boilers are in use, while in the No. 1 station two of the Babcock & Wilcox boilers are in use. The work of construction of a further plant is in progress in this Waimalu valley, some 250 yards distant. There the company is contemplating the installation of two 7,500,000-gallon horizontal type expansion pumps, which will be set in a pit some fifty feet below the surface, with Heine boilers situated on the surface above. In these stations in this Waimalu valley the plants resemble more particularly large mining propositions because of the extensive underground work, in the nature of drifts and tunnels to reach the artesian wells, it being necessary to install these pump plants at such locations in the valleys as will permit of as short lengths of pipe lines for the deliveries as is possible. Therefore the necessity of setting the pumps in pits below the surface of the ground in order to connect to artesian wells below the static level in the said wells, which averages about twenty feet above sea level.

From the foregoing it will be seen that all the power plants of the Honolulu Plantation Company have been concentrated in three locations; that of the sugar factory and general works at Aiea, and those of the power and pump plants in Ha'wawa and Waimalu valleys. From the two valleys where the pump plants are situated the lands are irrigated. The pumping plant which is now under way will consist of two 7,500,000-gallon pumps, which when erected and completed will make a total pumping capacity of 70,000,000 gallons per twenty-four hours, there now being pumping capacity equal to 55,000,000 gallons per twenty-four hours installed and in operation on the plantation.

The lands of the company are nearly all of a terminal of forty-two years, leasehold interest, the irrigating, power and mill sites being in fee simple holdings.

The average rainfall on the Honolulu Plantation is about the same as on adjoining plantations, which is about fifty inches annually. If anything, there is
a little greater precipitation on account of proximity to the mountains.

As a source of convenience to laborers and others employed upon the plantation the company conducts a general store and carries a stock valued at about $20,000. Goods are disposed of to patrons at the invoice rates plus freight and handling charges, as well as clerical expenses connected with store. The management puts no restriction on peddlers, merchants or outside traders in entering camps or premises, who are desirous of disposing of wares.

A feature of the plantation is the cleanliness that pervades the camps and laborers' dwellings, which are built with the object of keeping a high standard of sanitary conditions.

James A. Low is the manager of this model plantation and has filled that position since its very inception three years ago, and for the past ten years has been identified with the sugar industry of the Hawaiian Islands.

Following is the list of officers and directors of the company:

Jno. A. Buck, President.
N. Ohlandt, Vice President.
Samuel Sussman, Treasurer.
H. W. Thomas, Secretary.

5.3.8.8 Honolulu Sugar Company Expansion – Sale of Additional ‘Aiea Lands

The Hawaiian Star (1st Edition)
Valuation of Aiea — Was Discussed in Connection with Acquisition of a federal Building Site Last January. The estimate of $45,000 was Formally Agreed to Then Says Superintendent Cooper.

November 11, 1903 (page 1)

Superintendent of Public Works Henry E. Cooper has been looking up the history of former deals with regard to the Aiea land which is valued at $45,000 in his proposed exchange with W.G. Irwin, and finds that that was the valuation agreed upon by the government last spring, when the trade for a federal building was under discussion.

“The matter was discussed in council on January 11 and 12 last,” said the Superintendent this morning, and after considering a number of pieces of land available for exchange, an agreement was finally reached to acquire the Bishop lot for a federal building, and the lot was tendered to the federal government. The only reason that the Aiea land was not then traded on a basis of $45,000 value was that the federal government did not take up the building proposition.

“The Bishop estate lot was valued at $131,000 and the following were the various pieces of land which were discussed as available for exchange:

“Aiea, $45,000; Pololu, $10,000; Kahikapu Pond, $10,000; P.O. Site, 14,700 sq. ft., $68,000; Polu lot, 9,200 sq. ft., $46,000; Block 32, Esplanade, 14 lots, $140,000; part Block 33, 4 lots, $40,000.

“After considerable discussion an agreement was reached and a wireless was sent to Governor Dole, who was on Hawaii, asking him to take up the matter and approve it as soon as possible. He declined to do so until his return, after which he gave approval and the following lands were agreed upon to be given for the Bishop lot, on these evaluations:

Pololu $10,000.
Aiea $45,000.
Kahikapu Pond $16,000.
6 Esplanade Lots $60,000.
$131,000.

5.3.8.9 Honolulu Plantation Company Announces that it will Start its Own Refinery (1904)

The Hawaiian Star
Starts Its Own Refinery. Important Move by the Honolulu Plantation. Cuts Loose From the Sugar Trust Altogether and will Refine and Market its Own Sugar – Machinery for the Refinery Already on the Ground and will be Used for the Next Crop.

October 7, 1904 (page 1)

The Honolulu Plantation Company has cut loose from the “Sugar trust,” is installing the machinery of a refinery and will refine and market its own crop during the coming season, independent of all other Hawaiian plantations, as well as of the American Sugar Refining Company. This is the brief statement of one of the most important steps ever taken in the sugar business here. Within a few months it will result in the first shipments of refined sugar from Hawaii, the first sales by a plantation direct to consumers, since the sugar trust secured control of the; markets of America, and in the end, it is believed, the new plan will result in increased profits to the producers here.

The machinery for the refinery of Honolulu plantation is already on the ground and the refinery is being put up. It will be ready in time for this year’s crop, which will be about 17,500 tons, according to the estimates of Manager Low in his last report. The refined product will be shipped direct to San Francisco, where arrangements for marketing it have already been made, with firms
which are also operating independent of the "trust." Four large San Francisco firms have contracted to take the Honolulu company’s sugar and thus the refined, granulated sugar from California for the first time in the history of the sugar business.

Honolulu Plantation is located at Aiea and has about 3,030 acres of land in sugar. It is incorporated for $5,000,000 and is one of the successful plantations of the islands. Much of the stock is held in California, the company being a California corporation. James A. Low is manager and the directors are John A. Buck, N. Ohlandt, William G. Irwin, John L. Koster, M. Ehman, Samuel Sussman and William Matson. John A. Buck is president, N. Ohlandt vice-president—Samuel Sussman, treasurer and H.W. Thomas is secretary. The Honolulu agents are William G. Irwin and Company.

In installing a refinery the Honolulu plantation takes a step which has been discussed more or less for many years among the various plantations. The present method of marketing Hawaii’s sugar, to be continued by all the plantations with the exception of the Honolulu Plantation Company, is to sell to the American Sugar Refining Company, popularly known as the Sugar Trust. This concern has contracts with the planters of Hawaii whereby the sugar is shipped raw, either round the Horn or to San Francisco, and the price paid for it by the trust is according to the ruling market quotations on the day of arrival. As the trust is in control of the entire market, it is able to regulate prices to a large extent, and it is believed that Hawaiian planters frequently lose considerable by manipulations which prevent rises in price when big cargoes are about to arrive and send up prices just after arrivals. This has been much discussed here, but it has been the general idea that an attempt to fight the trust and enter the market inde-Continues on page five pendent of its aid would result in a financial battle in which the Hawaiians might find their foe too powerful. All plans to establish a refinery here, or one on the Pacific coast for Hawaiian planters generally, have come to naught except in the case of Spreckels, who years ago made the fight and is credited with having fought the trust to a standstill. The trust is in practical control all over the United States. It regulates the price at which it buys from the plantations and the price at which it sells to consumers, and its policy is said to even go so far as to limit amounts of purchases, so that the dealer who might want to stock up heavily when sugar is low cannot do so.

The Honolulu Plantation Company cuts loose from all these propositions and enters the California market, at least, as the rival of the sugar trust. With its own arrangements made for handling the product after it is refined, it is believe that the company will operated independently with better profits than it has been able to realize under trust control.

One local result of the establishment of the refinery will be the sale of Hawaiian refined sugar in the Honolulu market. At present, though Hawaii produces thousands of tons of sugar every year, all the table sugar used in the islands is imported from elsewhere. The refined product of the Honolulu plantation will probably quickly gain control of the local market.

5.3.8.10 Honolulu Plantation Labor Strike (1909)

In 1906, the O‘ahu Sugar Company operation was stopped by a strike, which was eventually settled. Japanese organizers were the leaders and among their conditions for ending the strike were cited for ‘Aiea at the Honolulu Sugar Company. The conditions included:

6. That Oahu Sugar Company will give each man a ticket which is to be punched daily and overtime to be endorsed on same, being the system now in use at Aiea and other plantations.

17. That as to clearing of railroads, section men be instructed to keep in good order as at Aiea and other plantations (The Pacific Commercial Advertiser, 1906:1-3).

The relationship between labor and management eventually deteriorated and a major strike on the Honolulu Plantation occurred. The matter was described in a number of local papers, with details as follows.

The Pacific Commercial Advertiser

High Wage Conspirators Stir Up A Strike at Aiea Planation

Makino and Negoro, After Night Session, Set Things Going—Say the Will Go for Second Plantation—Trouble Began Early Yesterday.

May 10, 1909 (pages 1 & 4)

"The Japanese laborers' committee on Honolulu Plantation at Aiea sent for Negoro and myself last night and we went down to Aiea in an auto. We found a meeting in progress and, we acted as advisers to them. They held a session which lasted nearly all night, and this morning at five o'clock a strike was ordered of all laborers on the plantation and not a man is working today. It is a strike backed by the Higher Wages Association, although the strike is in the hands of a committee from the plantation, and we are advising them what to do. We have advised them when they strike to do nothing illegal." Fred Makino.

When the hour arrived yesterday morning for all Japanese plantation laborers on Honolulu Plantation at Aiea to go to work, few responded and the management was almost immediately in receipt of information that a strike was in progress. The strike involves in the neighborhood of 1500 laborers. Backed by the two main agitators of the so called ‘Higher Wage Association,’” the strike was ordered during Saturday night and at 5 o’clock yesterday morning when the agitators returned to Honolulu after an all-night session, the word was passed along for the laborers to remain in their quarters. As far
as could be learned from those who were instrumental in bringing all work on the big estate to an abrupt and embarrassing termination. Their intentions are not only to tie up the Honolulu plantation, but another one also. In short, their plan is to tie up the plantations on this island in pairs.

Fred Makino, one of the instigators of the present agitation for higher wages, which was begun by him and Negoro, and not by the laborers themselves, stated yesterday that a quartet of four Japanese came to town from Aiea Saturday evening on bicycles in search of him and his friend. Makino and Negoro went to Aiea by motor and attended the meeting of the laborers committee. Makino said he was there to advise them in his capacity as an officer of the Higher Wage Association, which is behind the strike movement. He says he counselled them to avoid unlawful acts. Asked as to grievances the laborers had, Makino replied:

“The laborers want $1 a day and the mill men want $2.50 per day. The manager has been notified but the demand is being put in the form of a letter and that will be presented tomorrow. I will have a translation of the letter for the Advertiser.”

The Nippon, organ of the Higher Wages agitation issued an extra yesterday morning, the headlines being as follows:

**General Strike At The Honolulu Plantation.**
A Partial Success Claimed by The Higher Wage Association. Chinese Laborers Also Join the Strike.

A free - translation made from the Nippon’s extra gives the following general information: “A general strike of the Japanese laborers at the Honolulu Plantation at Aiea. Even Chinese laborers joined hands with the Japanese strikers, and things seem rather serious unless the plantation gives way gives way to the strikers’ demands.”

According to the extra of the Nippon, practically all the Japanese in Aiea were gathered at the mill camp of the plantation at 9:30 Saturday night to prepare for a general strike. Four principal men were delegated to come to Honolulu, there to consult with and ask the presence of President Makino, Secretary Negoro, Treasurer Yamashiro of the Higher Wage Association, and of Mr. Tsaka of the Nippon, all of whom left for Aiea at 2 o’clock Sunday morning.

They met several hundred Japanese gathered there from different camps; practically everybody was worked up by the beating of empty kerosene tins at the arrival of the officers of the Higher Wage Association. Messrs. Tsaka, Negoro and Makino made speeches praising the strikers’ determination and encouraging them to carry out successfully their fight.

After the speeches, representatives were chosen from each camp, and through them a formal demand for the increase of wages will be made this morning. Cheers were given, when the meeting came to end, for the strikers, for the Higher Wage Association, and for the Nippon.

Yesterday morning, irrigators and others refused to go to work and it is expected that all laborers, Japanese and Chinese, will refuse to go to work this morning.

The Nippon in the extra congratulated the Aiea Japanese for starting the ball to roll, and promised all the help the strikers may need. The paper may ask for general subscriptions from the sympathizers of their cause.

**What the Manager Says.**

Manager Ross stated last evening that no demands had been made, made upon him so far but he expected them today. Over the telephone, which was working badly, Mr. Ross was understood to say that no laborers were at work yesterday, although this may refer to the irrigators.

A well-known Japanese of Waipahu who was in town yesterday said that the agitation of the Higher Wage officials was being spread among the laborers at Waipahu in the hope that they would join the strike on Honolulu plantation, but it is believed this may be warded off.

“We will show the Advertiser that we are not the, irresponsible people you claim we are,” said Makino yesterday. “We have got the people behind us.”

**The Pacific Commercial Advertiser**

**Officers with Drawn Revolvers Angry Hold Mob at Bay at Waipahu. Strikers Attack Returning Japanese and try to Rescue Their Ringleader from the Police**

High Sheriff to the Rescue—Aiea [Japanese] March to Town.

June 9, 1909 (pages 1, 4 & 5)

With thirty-four regular police and deputies on guard, each armed with carbine and revolver, Waipahu as suddenly assumed very much the aspect of a military camp. Only prompt and determined action by High Sheriff Henry and the Honolulu police prevented a violent outbreak by the Japanese strikers at Oahu Plantation last night about seven o’clock.

As it was, Police Officer Wills and E. M. Scoville, head pump engineer of Oahu Plantation, were shut in a small house on Waipahu village street for more than two hours guarding a prisoner they had arrested, and threatened by a surging mob of strikers that would have broken into the building and seized the officers had it not been for the timely arrival of High Sheriff Henry, with a posse
of police, in an automobile.

White with fear lest his dupes should go too far and make trouble for which he would have to bear the blame, Makino, who arrived on the scene from Aiea shortly after eight o'clock, after the two men had been hemmed in the building for some time, implored the Japanese to desist and, with some of the local ringleaders to whom he communicated his fears, they endeavored to push their way between the crowd of strikers and the building.

Their attempts would have been unsuccessful and the mob, incensed by what they thought to be Makino's cowardice, would have succeeded in breaking their way in, in spite of the threatening revolvers of the besieged, had it not been for the lucky arrival of Henry and his posse.

With Police Officer Haumea, Wills had gone to Waipahu on the 3:30 afternoon train to protect a number of returning strikers. These were joined by others at the plantation and were safely ensconced in their camps, one of which Haumea was left to guard.

With Mr. Scoville, Wills then walked up the main street of Waipahu, where there was a large crowd of strikers gathered. As they approached the neighborhood of the Waipahu saloon they saw that there was trouble. A striker who wished to return to work had heard about those who had come back from Honolulu, had fetched his blankets and clothing and was making his way to the camp, where he expected protection

Understanding his intentions, a crowd of strikers set on him and, after tearing his blankets to pieces, proceeded to beat him up. The principal offender was immediately seized by Wills, who dragged him back and placed him under arrest.

Call For A Rescue. Then some of the ringleaders called on the crowd for a rescue, and the strikers began to close in on them. So threatening were the gestures made by the crowd, many of whom picked up stones, that the two men fired their revolvers in the air with the intention of signaling for help and scaring the mob.

Although their appeal for assistance was not answered, the mob broke back at the sight and sound of firearms, and Wills and Scoville were able to back their way into a room, which proved to be the headquarters of the strikers, taking their prisoner with them.

Once inside, they closed the door, barred it, and shouted that they would shoot the first man who attempted to force an entrance. For some minutes the mob surged threateningly in front of the building, but gradually dropped back, not one of them liking to be the first man to risk a bullet in his hide.

Then a sudden diversion was caused by the prisoner who, unsecured save for handcuffs, had made a dash for the backwindow of the room and was halfway out before Wills could drag him back. This drew the attention of the mob to the back if the house and a number rushed round there so that the two imprisoned men were threatened from both sides at once.

Situation Grows Serious. It began to look very serious. The howling of the mob had subsided to a low but determined murmur, and it was evident that they had made up their minds to something desperate. Coville guarded the rear while Wills stayed by the front, each man with revolver ready in case of attack.

It was at this crisis that Makino arrived in an automobile and called on the strikers to desist. He succeeded in drawing the larger number away and, during this lull, Manager Bull of the plantation forced his way through to the house and was admitted.

The meeting at which Makino and his lieutenants presided was a strenuous affair. For perhaps the first time Makino knew what it was to be howled at, and, argua as he might for his own safety, the crowd showed signs of leaving him and renewing the attack on the building.

Telephone For Assistance. Before reaching the room in which the two men were confined with their prisoner, Mr. Bull had telephoned to Honolulu for assistance. Sheriff Henry arrived in the nick of time to prevent further trouble, and the later arrival of Chief Detective Leal with twelve more men cowed the strikers into dispersing when they were ordered to do so.

As soon as quiet was restored and the prisoner safely stowed away, immediate steps were taken to patrol the district and prevent further trouble.

With Sheriff Henry were four men, so that with Joe Leal's party there were seventeen officers from Honolulu. Added to this force were seventeen more local deputies, each properly armed, and they were at once told off into squads to patrol the localities where trouble might start.

Attack With Cane Knives. Another outbreak, that might have been a very serious affair, was nipped in the bud by prompt action of the patrol. About a hundred of the strikers sneaked away and armed themselves with cane knives. Then they advanced on camp No. 10, which is occupied by Chinese and Korean laborers who have not been out on strike.

When the occupants of the camp saw the threatening mob approaching, they rushed into their houses with one accord and seized their own knives. Before trouble could start, indeed before the attacking party was within a hundred yards of the camp, a patrol approaching the camp saw what was the matter,
hailed some of the others, and the attacking party immediately broke up and ran helter-skelter into the darkness.

**Arrest The Leaders.** After that a rigid search was made for cane knives and a movement started to arrest each and every one of the ringleaders, including the hui of gamblers that has been making much of the trouble round the plantation.

Makino was to have been taken into custody, but he escaped before it was decided to take the step. He jumped into his automobile and was whirled back to town, and must have passed Leal and his party on their way out.

**March in from Aiea.** Promptly on hearing of the trouble the Advertiser sent a reporter down the line with the police. Word soon came from him by telephone from Aiea, where a large number of strikers from Waimalu, on the Honolulu plantation, were massed. These men, since they struck, had been loading around the plantation, but, after being harangued by Makino, had concluded to march into town. They were about to start as the reporter left. Captain Baker and a dozen special officers were on duty at Aiea.

**Under Surveillance.** All the plantations are now under efficient surveillance. Local deputies have everything quiet at Wai'alu; at Kahuku, Reeves and Medeiros, special officers, have a force of twelve men; at Aiea, Captain Baker has twelve men, while, as already stated, thirty-four police and specials have the situation well in hand at Waipahu.

**A Rigid Inquiry.** As soon as they received news of the trouble, W. A. Kinney and R. D. Mead, attorney and secretary of the Planters’ Association, accompanied by Chester Doyle as interpreter, left for Waipahu in an automobile.

It was mainly at Mr. Kinney’s suggestion that the arrests were made, and, after many of the supposed ringleaders had been taken into custody, they were brought into the office of the mill and there an examination was conducted.

The original prisoner arrested by Wills is named Jotaro Mikava, and admitted having assaulted the returning striker. Many of the others were examined separately, and lately, advice states that the board of inquiry has obtained much valuable information as to the personnel of the real instigators of the trouble.

**Found in Same Room.** Strangely enough eight of the leaders in the strike and the recent outbreak were found and placed in custody in the very room in which they had hemmed Wills and Scoville. This room was their headquarters and, not thinking there would be any further action by the police after quiet was restored, they had gathered in the room to talk the matter over.

They made no resistance when told to accompany the officers to the mill, but went quietly enough. It was noticeable with all those arrested that they did not carry themselves very jauntily, but seemed rather overwhelmed by the prompt action of the police. Makino has been doing his best to persuade them that the authorities would take no action. He has now had a taste of reaping part of a hurricane from the hot air which he sowed.

**Threat to Blow Up House.** A Japanese friend of the twenty-two returning laborers who are under police protection at Waipahu told them late last night that he had overheard a plot to blow their house up. One of the officers on duty notified Manager Bull, and he interviewed the informant, hearing the statement repeated. The guard around the place was at once doubled.

**Makino Talks to Aieans.** The Aiea strikers that came in to Honolulu last night were met at the Kalihi pumping station soon after midnight by a delegation of local Japanese, among whom were many of the strikers from the different plantation. They had colored lanterns with them and, when the Aiea Japanese, including women and children, arrived in sight, they were greeted with much waving of lanterns and Banzais.

The two delegations then coalesced and tramped along King Street to Beretania. Here a halt was called, while Negoro made a short speech, which was greeted with many more Banzais.

Opposite Aala Park the column halted again, where Makino, Negoro and two of their lieutenants stood on a bench. They all crowded round while Makino, looking as pert as you please, addressed them. A friendly interpreter stated that he was telling them to stand together for the honor of Japan and for their families, not to waver, but to stand and win peaceably.

As asked after the meeting how he felt after the Waipahu pilikia, Makino looked in a wondering way at the questioner and wanted to know “What pilikia?” He affirmed that there had been no trouble at the Oahu plantation and that everything was smooth and lovely, but that the strikers would surely win.

The delegation from Aiea dispersed in a very orderly way, apparently tired enough to accept whatever hospitality the local Japanese sympathizers were able to offer them.

**Henry Bringing in Leaders.** At 2 a.m. this morning word was telephoned in from Waipahu that High Sheriff Henry was about to leave for Honolulu with eight of the arrested strikers who had been examined at the inquiry. At that time all was quiet on the plantation.

**Before the Outbreak.** Strikers from the town camps established by the Higher Wage Association deserted yesterday and returned to work at Waipahu and
Aiea plantations and by this morning several hundred more are expected to be back applying for their old jobs. Events in strikedom moved rapidly yesterday, the first news reaching town being that the Waipahu men had voted to return to work this morning rather than submit to being paid off at noon yesterday and evicted from the plantation.

Then, came the news that strikers were going back to work at Aiea, and shortly afternoon it was known that in despite of Makino's efforts the solid phalanx of strikers held in town had taken matters into their own hands and intimated to the plantation people that they had had enough of the strike and were ready to go back. It was stated that about one hundred would go back on the afternoon train to Waipahu, and arrangements were made to take them down on the special train of cars, which would return in the evening with the strikebreakers.

When the strike leaders saw the movement, they made every effort to check the exodus from their camps, and did actually prevent a large number from joining the movement, and only a dozen went down on the train at 1:30.

These were joined a little beyond Waipahu railroad station by nine others, including two women, who had all been kept concealed in the house of a rice planter. They boarded the train quickly, not desiring to be seen by the Japanese strikers loitering about the station. On arrival at Waipahu mill the delegation was met by Manager Bull and his head men, who had been informed that many of the strikers were returning. They were somewhat disappointed in the size of the crowd, but Mr. Bull had them conveyed to a house in which they formerly lived, and not only the plantation police officers, but two uniformed police officers from town who accompanied the Japanese on the train were posted as guards to prevent their being troubled overnight.

Manager Bull and his men were more that surprised, when the former strikers arrived, to recognize in the man to step off the train, one of the leaders of the strike, Watanabe, a contractor who has thousands of dollars invested in his various enterprises. Watanabe removed his hat and bowed low to Manager Bull and the others. On being questioned, all the men stated that they desired to go to work this morning, and meanwhile they asked for police protection.

They also stated that at least one hundred of the men who formerly worked for Watanabe and other contractors would be waiting at the outskirts of the plantation to be brought in and placed under police protection. Manager Bull gave orders to have the plantation train run down to the place designated by the former leader and bring them into camp.

“Well these are the first Japanese we have seen in the grounds since they were paid off and ordered out,” said manager Bull.

Just before the regular train left for Aiea thirty-five Japanese bought round-trip tickets to Aiea. It was understood that they were to call a meeting at Aiea and discuss the matter finally and decide what they should do. They were to return to town and notify those in town of the action of the meeting.

Makino got wind of this movement, and at 3 o'clock left town in an auto, accompanied, by Negoro and Yamashiro. A reporter saw the party as it left. He picked up a match and broke it letting the pieces fall to the ground and looked at Makino to observe the effect. Makino understood that it referred to the collapse of the strike and looked cross. When asked where he was going and what he intended to do on his trip, he replied lamely, "I'm going to make a last effort to hold them." All the old-time bravado and "hot-air" were gone. He went to Aiea, where he addressed a meeting under the larger back of the theater. The audience was composed mainly of contractors and their men.

Nearly every man and woman who formerly worked on Ewa plantation was at work yesterday morning, thus closing the strike incident on that estate. With the return of all strikers to Waialua this morning another chapter in the strike will be closed, and as the strike on Waipahu and Aiea is now broken, the end is not far distant.

1700 Strikebreakers today. Despite the return of the strikers to work the planters are continuing to furnish strikebreakers, and about 1700 will go to Aiea and Waipahu today. There is much heavy work to do on the plantations just now, many of the fields are requiring additional irrigation, and the steam plows are hard at work plowing up fields in preparation for planting.

Lightfoot and Thugs. With reference to the statement in the Bulletin that the Higher Wage Association was unable to put up the attorney's fee to defend the assailants of Gichi, the Ewa Japanese who wanted to go back to work some time ago, Attorney Lightfoot, who was selected as legal adviser by the Higher Wage Association at the commencement of the strike, said yesterday that the men who assaulted Gichi asked him to defend them in court, and he refused. He stated that they had gone outside the plan of the Higher Wage Association, and that it was Makino's wish, and of the association as well, that they be not defended by the association. It was not a case of the Higher wage Association, or the strike leaders lacking in funds, but simply that he (Mr. Lightfoot) would defend no one guilty of committing violence during that progress of the strike.

Striking at Lightfoot. It was reported yesterday that since the collapse is close at hand that Makino has been saying harsh things of Attorney Lightfoot, adviser of the strikers. He said that Mr. Lightfoot's speech at the mass meeting some weeks ago was "foolish," and that he had only taken up the Higher Wage matter with the idea of popularizing himself with the Japanese. He said that this effort had failed, and that Mr. Lightfoot would now have a hard time squaring himself with the haole and particularly the planters.

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A British Subject. One of the police officers state at Aiea last evening that Makino during the course of some heated remarks made there, said, "They can't touch me anyway, for I'm a British subject." Makino, as is well known, is part Japanese and part English or American.

No Longer a Leader. Makino is no longer a leader. His star has fallen, and since Sunday he has been making frantic efforts to stay the final crash of his hopes and ambitions. According to many of his statements, for several weeks past, he believed that he would become one of the big men in the Japanese community and in a position to almost dictate terms to the planter, who he has abused and ridiculed with the utmost abandon.

Sheba Made a Convert. While editor Sheba was being shaved yesterday in a Japanese barber shop on Hotel street, some countrymen of his sat by discussing the strike. A Japanese who works in a local saloon entered and after some conversation about the strike, said: "Sheba ought to be killed." The editor jumped out of the chair and confronted the fellow and said, "I am Sheba. If you want to kill me here is a chance." The man was alarmed and the bystanders, thinking a row was impending, interfered.

Mr. Sheba then told the stranger that he meant him no harm and would like a chance to explain his position towards the strike. The two men went to the Shingo office where Editor Sheba learned to his amazement, that the other Japanese held him responsible for the strike and for the losses his brother, a tinsmith at Ewa, had incurred from it. The man could not read, but he had heard what Sheba was to have everything that had gone wrong. The incident ended with the stranger becoming a Sheba partisan.

The Pacific Commercial Advertiser
Woman Strikebreaker in Pay Line

June 9, 1909 (pages 1 & 4)

If you want to see fifteen hundred men of almost every nationality known in Honolulu, save Japanese, come in from the plantation at the close of day, dirty, hungry, and above all anxious to receive their pay envelopes containing $1.50 each, go down to the Dahu Railroad depot any afternoon between 5:30 and 6 o'clock. It is one of the most unusual sights ever witnessed in Honolulu, and is due only to the fact that the Japanese laborers on Aiea, Waipahu and Ewa plantations struck for higher wages and that some are still striking.

Few people had any idea that a call for strikebreakers would bring a horde of two thousand men clamoring at the railroad gates at 4 o'clock in the morning each more than anxious to get a ticket which would give him a ride to the plantation and entitle him at the end of the day's work in the sugar cane fields and mill to a ride back home and $1.50 cash. But they are there every morning—Hawaiians, Portuguese, Spanish, Chinese, Koreans, Porto Ricans, negroes, Filipinos, Americans—well, it is difficult to enumerate the many nationalities.

When the work train arrives in town, it is halted beyond the edge of the shed, and head men among them organize three long lines extending far down the yard. The police are on hand with a fire rope. As there are three sets of tracks running into the shed there are also three sets of cement walls between, and over these walks the three lines of men go with splendid discipline. It is not entirely discipline, but the result of almost a month's experience in falling into the pay line.

At the opposite end of the shed the three gates are partially opened and at each stands the gentlemanly representatives of the planters with their sacks of envelopes one man to take the tickets and the other to pay over (Continued on Page Four.) the envelopes. At the signal that all is in readiness at the gates, the fire line is dropped and the three long lines start for their money. It is done with a shout, but there is order and no roustabouting, as in the first days. Every man knows he will get his pay.

There was a surprise in store last evening for the pay clerks. One of the strike breakers was a woman. When she reached out her hand for the envelope the young man almost dropped it. The woman passed over her ticket which was duly punched, and she received the envelope. She was dirty and showed signs of hard labor, and carried her school sack as a provision carrier, just the same as the men. She appeared to be Spanish. When asked what kind of labor she performed, she smiled and threw goo-goo eyes at the gentlemanly young men, while her hand closed eagerly around the envelope.

Fifteen hundred men and, boys, and one woman, formed the army of strikebreakers that manned the sugar fields of Waipahu and Aiea plantations yesterday. None were sent to Ewa, owing to the strikers having returned to work. Seventeen hundred will probably be the number leaving today.

A. McGuire handles the crowd when they leave in the mornings, handing out the tickets. He is one of Mr. Mead's right-hand men in all matters in which the Planters' Association has an active interest.

At the same time the Honolulu Sugar Company was being developed and first crops being planted, the United States was planning land acquisition and development of Pearl Harbor. Lands held by the plantation in fee-simple and leasehold interest were among those desired for the military installation. In 1901, the lowlands of Hālawa, fronting the main channel into the Pearl Harbor, were among the tracts being considered. The lands extended inland along the coast including places like from Kōmōawa to Helekahi, Keanaupu'a, Kūhūa Island, and Kūnānā. Litigation over condemnation proceedings soon made its way to the courts, but by
5.4 Condemnation and Military Base Development by the United States

The Wilkes Expedition in 1840-1841 identified Pearl Harbor as a potential asset for large American ships and as the best harbor in the Pacific. The inlet has somewhat the appearance of a lagoon that has been partly filled up by alluvial deposits. At the request of the king, we made a survey of it: the depth of water at its mouth was found to be only fifteen feet; but after passing this coral bar, which is four hundred feet wide, the depth of water becomes ample for large ships, and the basin is sufficiently extensive to accommodate any number of vessels. If the water upon the bar should be deepened, which I doubt not can be effected, it would afford the best and most capacious harbor in the Pacific (Wilkes, 1970:80).

By 1851, the U.S. expressed its interest in the area, but to no direct action (c.f. U.S. Congress – The Bates Bill, in *The Hawaiian Gazette*, 1908:2:2). Under much pressure from foreign resident-businessmen and representatives of the United States, King David Kalākaua entered into an agreement granting the U.S. Navy the exclusive rights to Pearl Harbor as a naval base on September 9, 1876. Known as the "Reciprocity Treaty," the agreement covered a period of seven years and granted both the emerging sugar plantation interests and rice growers a special status of exporting Hawaiian crops to the United States, duty-free (Kuykendall, 1967:46-47). The treaty, known in the Kingdom as the "Bayonet Constitution" was forced upon the King and renewed in 1887, with terms extending to June 1900 (Kuykendall, 1967:370-371).

In 1872, prior to the "Reciprocity Treaty" and "Bayonet Constitution," the United States sent military leaders to Hawaii to make a quiet investigation of the suitability of Pearl Harbor as a base for naval operations. The investigation also explored the possibility of Annexation of the Kingdom by the United States—these discussions generally to place with foreign residents who were also operating businesses in the Kingdom. In 1873, Generals J.M. Schofield and B.S. Alexander engaged surveys and studies of the "Pearl River" environment (Figure 20) and reported their findings to the military and congressional powers. The 1901 "Compilation of Reports of Committee on Foreign Relations, United States Senate. 1798-1901, First Congress, First Session, to Fifty-sixth Congress, Second Session, Volume VII," includes the Schofield and Alexander findings and recommendations from 1873:

**OPINIONS OF U.S. MILITARY AND NAVAL OFFICERS CONCERNING THE CONTROL OR ANNEXATION OF HAWAII.**

On June 24, 1872, Secretary of War Win. Belknap issued confidential instructions to Generals Schofield and Alexander to go to Honolulu and investigate its defensive capabilities in the event of war between the United States and some other maritime nation. Their report is lengthy and contains the following:

We ascertained from the officers of the U. S. Navy, from maps, and from seafaring men that Honolulu is the only good commercial harbor in the whole group of the Sandwich Islands. An enemy could take up his position outside of the entrance to the harbor and command the entire anchorage, as well as the town of Honolulu itself. This harbor would, therefore, be of no use to us as a harbor of refuge in a war with a powerful maritime nation.

**PEARL RIVER ONLY HARBOR THAT CAN BE PROTECTED IN TIME OF WAR.**

With one exception, there is no harbor on the islands that can be made to satisfy all the conditions necessary for a harbor of refuge in time of war. This is the harbor of Ewa, or Pearl Harbor, situated on the island of Oahu, a bout 7 miles west of Honolulu.
Pearl River is a fine sheet of deep water extending inland about six miles from its mouth, where it could be completely defended by shore batteries. The depth of water after passing the bar is ample for any vessel. Pearl River is not a true river; it partakes more of the character of an estuary. It is divided into three portions called "locks"—the east lock, the middle lock, and the west lock, the three together affording some 30 miles of water front, with deep water in the channels.

**EASILY DEFENDED—WATER—LAND—PROVISIONS.**

If the coral barrier were removed, Pearl River Harbor would seem to have all, or nearly all, the necessary properties to enable it to be converted into a good harbor of refuge. It could be completely defended by inexpensive batteries on either or both shores, firing across a narrow channel of entrance. Its waters are deep enough for the largest vessels of war, and its locks, particularly around Rabbit Island [Moku`ume`ume], are spacious enough for a large number of vessels to ride at anchor in perfect security against all storms. Its shores are suitable for building proper establishments for sheltering the necessary supplies for a naval establishment, such as magazines of ammunition, provisions, coal, spars, rigging, etc., while the island of Oahu, upon which it is situated, could furnish fresh provisions, meats, fruits, and vegetables in large quantities.

**IF MADE A NAVAL STATION JURISDICTION SHOULD BE TRANSFERRED TO THE UNITED STATES.**

In case it should become the policy of the Government of the United States to obtain the possession of this harbor for naval purposes, jurisdiction over all the waters of [1901:272] Pearl River, with the adjacent shores to the distance of 4 miles from any anchorage, should be ceded to the United States by the Hawaiian Government.

This would be necessary in order to enable the Government to defend its docks and anchorages in time of war by works located on its own territory. Such a cession of jurisdiction would embrace a parallelogram of about 10 by 12 miles.

**ACTION MOST BE IN ADVANCE OF WAR.**

It is to be observed that if the United States are ever to have a harbor of refuge and naval station in the Hawaiian Islands in the event of war, the harbor must be prepared in advance by the removal of the Pearl River bar.

When war has begun it will be too late to make this harbor available, and there is no other suitable harbor on these islands. (Vol. 2, Rep. Sen. Com. on For. 1. VI. concerning Hawaiian Islands, pp. 963-966.)

The U.S. military did not engage in serious planning to develop Pearl Harbor until 1899, after the foreign resident business interests deposed Queen Liliuokalani, the legal monarch of the Kingdom in 1893, and Annexation of the Hawaiian Islands by the United States in 1898 (Evening Bulletin, 1899b:1).
In the 1880s many of the same businessmen and foreign residents who engaged in the process of deposing Queen Liliʻuokalani, forced themselves upon her brother, then King Liliʻuokalani, in reshaping the Hawaiian Government, and forcing the king into a new treaty with the United States, which included extended rights to Pearl River (Pearl Harbor) for military development. This was the "Bayonet Constitution" cited earlier in this section of the study. In October 1886, the Daily Bulletin described the situation around Honolulu Harbor, and suggested the Pearl Harbor should be investigated for development.

**The Daily Bulletin**  
Lack of Clear Perception.

**October 28, 1886 (page 2)**

Our comparatively venerable and superlatively wise contemporaries are discussing the harbor in a manner that is, at least in part, rather idle. What is the use of complaining about the filling in that has been done on the harbor front at this time of day? If water is needed more than land, there are vast expanses of coral reef on almost every other side of the harbor that can be dug out as easily as the portion could have been which has been reclaimed for building ground. Supposing the Government waited until it could afford the enormous expense of dredging out what it instead built up into dry land, where could the vast commerce anticipated find space for wharf and warehouse accommodation inside of the deep water line? The land is all occupied right down to the reef, with doubtless a high valuation put upon it by the many proprietors. Commerce cannot establish easy communications between sea and shore over the roofs of houses and flower and vegetable gardens. It would have to buy out all the real estate intervening between the sea and available business sites.

In view of these things, as well as of the fact that the filling in referred to has given a part of the entrance [illegible] the harbor, it would be hardly wise, if matters were put back to the conditions existing before that operation was begun, to decide upon digging out instead of dumping in. By the time the harbor is dug out for deep sea commerce over to the prison embarkation on the Ewa side and to the quarantine station opposite the town, the Government will need to take a good long rest for the replenishment of its resources. Indeed, before so much scooping out of coral reef is required by the fabulously large additional commerce anticipated from the Canadian and Panama steam and sailing traffic, it would be necessary to double the width of the harbor entrance and increase its depth by one half.

Moreover, after all is done that may be done for enlarging the capacity of the harbor of Honolulu, before accepting the stupendous alternative of digging out of Esplanade and buying all the real estate from the water front to Queen street, it would be perhaps worthwhile having a commission of engineers to report upon the cost of deepening the entrance to Pearl Harbor. Open out that beautiful and spacious sheet of deep water to commerce, and the fleets of all nations may be invited to come and find accommodation at the hands of "little Hawai‘i." That would be taking commerce away from Honolulu. So it would, but it would be all in the country, and Honolulu will be rather crowded for comfort when it has secured all the business that its harbor can accommodate after all the presentely feasible improvements are accomplished without counting the shoveling out into the ocean of the splendid tract of building ground added to the city front under the administration of Major Gulick.

After securing the Bayonet Constitution, U.S. fleet issues arose in Samoa, and Pearl Harbor was again discussed as the logical base for America’s navy.

**The Hawaiian Gazette**  
What the Samoan Disaster May Do For Pearl Harbor

**April 16, 1889 (page 2)**

Among the points upon which interest will be quickened, will be that of foreign harbor improvements. This was shown even before the (USS) Niapiscan canard, in the liberal appropriation of $500,000 made by congress for possible contingencies, and for improvements at the harbor of Pago, ceded to the United States at Tutuila. Successive Administrations at Washington have somewhat languidly moved towards the improvement of our Pearl Harbor, of which they have the exclusive privilege for naval purposes. This concession remains useless to the United States until they deepen the channel through the soft coral of the outer bar, so as to admit large ships. Lieut. Wilson of the Vandalia, with his assistants, made a minute and exhaustive survey of both the harbor and bar during 1887-8. We believe the cost of opening the channel will be much less than one million dollars. It is reported that the losses of the U.S. Navy at Apia will foot up over two millions, showing how small, in proportion to possible losses, is the probable cost of needed improvement to the harbor.

With the opening of the bar at Pauaoa, the Pacific squadron of the American navy will manifestly be in a greatly strengthened position. It will be in the exclusive possession of the only first-class harbor in the mid Pacific, and in all respects, one of the very best harbors in the world. No destructive waves like those at Apia can possibly traverse the long, river-like channels above Pauoa, even if they could pass in full force over the barrier reef. The inner reaches of the harbor are safe against even the heaviest earthquake waves, or of anything short of a Krakatoa convulsion, such as drove the sea five miles inland. We never have hurricanes in this region of the Pacific, but even in the fiercest cyclones, vessels in the Ewa lagoons would have their anchors in stiff mud, the best of holding ground. If driven ashore they would bring up on mud banks from which they could be easily and safely removed.

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16 A hurricane on March 15-16, 1889 destroyed three American and three German Naval Ships.
Here is a description: From Kea'ali'i to the mound at the entrance of Pu'uloa harbor, there is a channel on the west, near Kapakule. Then [it runs] from Kapakule to Kepoo'okala. From Kepoo'okala [Waipio] one turns towards the estuary of Ka'uupalai, and Kapapu'upu'i is on the west side. That is the branch of the estuary of Honouliuli. Amoe Haalelea is the chiefess, landlord of this section of the estuary, and the lesser landlords, who control the fishing boats.

From Kea'ali'i and the channel to Kapakule, and to the east, to the tip of Moku'mumea, is the estuary channel of Komoawa. This branch of the estuary is now called the Halawa Branch. There are two titled landlords here, their highnesses Queen Emma and Ruth Ke'e'ikolani.

From Kepoo'okala, along the sheltered western side of Moku'mumea, along the Halawa branch, and along the point of Panai to Kalae'honu, Kupahu, and Halualani, this branch of the estuary is called Waipio and Waiala. The titled land lords of this section of the estuary are Malaeni li and the relatives of Ruth Ke'e'ikolani. This is an expansive place, not filled with thousands of boats and more, from the point of Pipio'a to Moku'mumea, and from there to Halawa. Turning north are the lands of along the sheltered bays of Manana, Waimano, Wai'au, Waimalu, Kalauao, and 'Aea. Waimalu is the land division to which Moku'mumea belongs.

What right does the government have in giving Pu'uloa and Ewa as payment for the Reciprocity Treaty? I know of no right that the government has... [Maly, translator]

5.4.2 An Anti-Annexationist Describes the Environs of Pearl Harbor and the Social-Political Environment of Hawai'i in 1895

An Essay on Acquisition of Pearl Harbor

The Independent

Pearl Harbor. The history of its acquisition. Its location, appearance, and other characteristics. An unorthodox view by a student.

May 8, 1895 (page 1)

Editor Independent: Allow me space in your columns to publish an essay on Pearl Harbor which probably will seem very unorthodox and which in many ways differ in opinions and views from the well-established doctrine that the salvation of Hawai'i lies in the cession of Pearl Harbor to the United States, and that the salvation of the United States lies in the possession of Pearl Harbor. I write at some length because I do not alone desire to convince you, Mr. Editor, but also the great numbers unacquainted with the harbor of its uselessness to Uncle Sam as a naval station or as anything else. Thanking you in advance for the space you allow.
I remain yours against annihilation, Student.

When in the year 1866, while the treaty extending the alleged "Reciprocity" Treaty of 1876 between the United States and Hawai'i, was under consideration in the United States Senate, Senator Edmund secured the interpolation into its text of an article providing for the cession by Hawai'i to the United States, of the exclusive privilege of entering Pearl Harbor with its ships of war; and there establishing coming and repair stations for the navy of the latter, he did an act whose consequences are not yet fully unfolded. That was a shrewd piece of strategy on the part of the Vermont Senator, and one which did not at all appeal to, or comfort the Cleveland administration of the day, as the writer hereof has ample means of knowing. But it rendered possible by the diversity of sentiment in the Senate, as to the renewal or extension of the then all but lapsed treaty, upon any terms; and the scale seems to have been turned in favor of such extension by throwing in that large sized bunch of national policy, of indefinite weight, but then supposed, by those who knew where Pearl Harbor was located, to represent a decisive strategic advantage to the United States.

As negotiated by President Cleveland's Secretary of State, Mr. Bayard, the new treaty was a very brief and unsatisfactory document, and merely extended, in terms, the then existing treaty, for a period of seven years from the date of the exchange of the ratifications therein provided for the old treaty, as already stated, had then all but lapsed. Indeed, it was enjoying a most precarious tenure of life, for its stated term of seven years had long ago expired, and it was subject to complete abrogation upon twelve months' notice from either of the contracting powers. It was merely a tenant at sufferance in the American Treasury, liable to be served with notice to quit any day, and with a numerous and influential contingent in the Senate clamoring for the immediate service of such notice as would extinguish it, and would relegate Hawai'i, that pauper pensioner upon the funds of Uncle Sam, to a position of self-dependence. It was felt, and most reasonably so, that the treaty in question, which admitted Hawaiian sugar and rice to American ports duty free, in the face of a general duty of about two cents per pound upon those commodities, was nothing more or less than a bonus of so much money paid by the American tax-payers to the so-called "Hawaiian" planters, - under which innocent and convenient descriptive appellation were included planters of every nationality from China to Sweden, in an eastward course.

But when the document, submitted by the President to the Senate, came from that body with an amendment embodied in its text which completely changed its purport by calling for a cession by one to the other of the parties of a supposedly highly valuable but indefinite territorial advantage, it metaphorically knocked both the "high contracting parties," as represented by the Executive of either Power, still higher. President Cleveland pointed and sulked, as well he might, to see his little commercial contract transmogrified into a treaty of territorial accession by the Senate, whose sole function in the premises, was supposed to consist in either approving or rejecting the instrument submitted to it, without amendment or alteration. So much disposed was Mr. Cleveland to resent this unexampled invasion of the Executive domain, that his Secretary of State actually notified the Hawaiian Minister at Washington, that the President did not regard the treaty, as negotiated and agreed upon by the diplomatic and as submitted by him to the Senate, as having been approved by the latter body in such manner as the constitution contemplated, nor so as to make it incumbent upon the President to proceed with the exchange of ratifications.

But, if the effect of the Senatorial aberration referred to was sullenness in the White House, it was consternation in Iolani Palace in Honolulu and in the halls of the sugar barons throughout this group. The administration of Prime Minister Gibson, though want to flout the barons aboresaid upon all minor matters and occasions, seemed to realize that they must, in spite of the baronial opposition to and abuse of their general policy, so far modify the barons on the treaty questions as to keep secure their grasp upon the United States treasury. Mr. Gibson was a shrewd old fox in matters political. He has taken the measure of the barons, and of their patriotic pretensions, and he knew that, while left to feed undisturbed upon the dividend pie for which they have shown such a relish, no real danger lurked behind their political mountings. Consequently, it was deemed of vital importance to Mr. Gibson's administration that the treaty should be extended upon some terms; but those proposed by the Senate, involving as they did a cession of the territory of and of course of sovereignty, would expose that administration, if accepted, to a new danger from its erstwhile supporters, the Hawaiian people, - who swore wild oaths against anyone who should sign away an inch of their territory.

And so it came to pass that the sults into which the Edmunds amendment to the text of the treaty had thrown Mr. Cleveland, proved the salvation, for the time being of the Gibson regime for, quietly depositing the amended draft of the treaty in a pigeon hole of the State Department, the President went at rest for a year or more all treaty agitation; the Louisiana Senators retired from the fight against its extension: the barons of Hawaii resumed the task of spending their dividends and clipping their coupons; and until the latter part of 1887 nothing further transpired as to the cession of Pearl Harbor.

In the meantime (June 30-July 1, 1887) the first in the series of bloodless revolutions for which Hawaii has become so notorious at least notorius came to pass. Through it Mr. Gibson was forced out of the Government, a so-called Reform Cabinet was placed in office, the constitution was abrogated, and another promulgated in its stead whereby the King was reduced from a personal ruler to a virtual figure head. The sugar barons were in the saddle under the new dispensation, and at once negotiations were re-opened for an extension of the treaty. Mr. Cleveland, meantime, had outgrown the feeling of
resentment incident to the Senate's having trodden upon his executive corns, and began to admit the advantage of proceeding to an exchange of ratifications of the treaty. This was accordingly done in November 1887, and so the treaty was given a renewed term of seven years, at the end of which period, in November of last year, and thereafter, either party may abrogate it upon the twelve months' notice to the other.

But the exchange of ratification last referred to was preceded and accompanied by a correspondence between the Hawaiian Government, acting through its Minister at Washington, and the American Secretary of State, Mr. Bayard, wherein was embodied what diplomatic gentlemen are pleased to term a "contemporary construction" of the meaning of the Article in the treaty which cedes to the United States the exclusive rights above referred to. In a few words, the effect of such correspondence was to declare that each of the contracting parties understood and interpreted that article to be coterminous, in point of time, with the rest of the treaty, and that it implied and involved no cession of sovereignty in any part of the ceded water or territory, by or on the part of the Hawaiian Government to the United States. Just how one nation can cede to another exclusive privileges of occupancy of the territory of the ceding power without a cession or loss of sovereignty, or just how there can be a dual sovereignty in Pearl Harbor, in case it shall ever be occupied as contemplated in the article of the treaty now under discussion, is one of those puzzles which, perhaps, can best be answered by members of the Corp Diplomatic. In the meantime the United States Government through its naval officers on this station has been setting as though it intended to avail itself of the grant in question and be the balance of this article now be devoted to a description of the subject of the grant, its physical features, and other matters pertinent to an understanding of the situation in the world-famous Pearl Lochs.

May 9, 1895 (page 1)

The existence of Pearl Harbor is without any apparently adequate excuse in nature. It is a body of salt water, but is neither sound, by, channel, strait or inlet, nor anything else of the kind for which hydrographers have found appropriate names, so, for want of a more accurately descriptive appellation, it is called a harbor. The prenominal "Pearl" is derived from the fact of pearl oysters being found there in small numbers and of uninteresting physical characteristic. The names Pearl River, Pearl River Harbor, and Pearl River Lochs are also familiarly applied to the water in question, but there is no more excuse for applying the word "river" than the word "ocean" to the place. There is not even a permanent stream of any respectable proportions emptying into the harbor and only one stream (scarcely more than a brook), which is not dry during more than half the year. The "river" is therefore a purely imaginary feature of the landscape.

In fact, all the streams on the south side of Oahu are but brooks, except that entering Honolulu harbor, with that exception, their insignificance is equalled only by that famous stream in America [Heaven only knows its location], for which the local congressmen was pulling for an appropriation, whereas the late lamented "Sunset" Cox declared that along its course, "you can't find a dam, by a mill site! And you can't find a mill, by a dam sight." Yet the supply of water to Pearl Harbor is considerable, numerous springs in the low ground contiguous to the East and Middle Lochs: and this water, before meeting with the brine of the lochs, is utilized to propel the machinery of several rice mills and in irrigating considerable areas of rice, bananas, pineapples and other crops.

The south shore line of the Island of Oahu lies in an almost exact east and west direction from the base of Diamond Head (Leahi), that most picturesque landmark at the southeast corner of the island, to the mouth of Pearl Harbor ten miles to the westward. Passing the poetical and picturesque shore of Waikiki, with its deep and feathery fringe of giant cocoa palms nodding above a lower growth of the intensely green and lace-like algarroba, (a species of the locust) with the beach guarded by a reef line upon which the waves break in a continuous line of foam, we reach at a distance of four miles a break in that roof line, through which runs the channel to the harbor of Honolulu. To the westward of the Honolulu harbor entrance the reef line extends to a greater distance from the shore line inside the outer reef are other and similar reefs or rather one extended reef, with ridge lines reaching to and above the surface at low water, in many places having over-lapping ends, the whole giving to the locality at low water a monotonous and dreary aspect, which at high tide gives place to a scene of thundering foam, rolling over an expanse of many square miles. And yet that inner field is navigable by very small craft when handled by experienced local navigators, though the deeper water of the open sea is almost invariably sought by the traffic, whether of business or pleasure, between Honolulu and Pearl Harbor and vice versa.

Pearl Harbor is peculiarly difficult of approach, when the normally calm condition of the ocean in its front is taken into account. Among the elements of this difficulty is that very calms which habitually reigns upon those waters outside the reef and the absence of bold headlands or other conspicuous landmarks at or near the mouth of the harbor, by which to steer a course, superadded to the tortuous character of the channel to the entrance, as now existing. It is well said, that one may reasonably imagine himself on the bosom of the Pacific, while in reality upon the shoal water that for several miles from the entrance to Pearl Harbor is under laid by a deep bed of sand, and this expanse of water, while ordinarily placid during the prevalence of the trade winds from the north east, becomes a raging mass of breakers during the time of "Kona" or southerly storm of periodical occurrence in these latitudes.

But to leave the subject of this sand-bed for a future paragraph, let us discuss the facilities for entering the harbor as now existing. Your correspondent on
the occasion of his visit to Pearl Harbor for the purpose of preparing material for this sketch chartered a sloop in Honolulu, and with a brace of old sea dogs to do the navigation, and a few friends to assist in enjoying the scenery, the balmy breezes and the matchless beauties embodied in the ever-changing hues of that opal sea, glided out of Honolulu harbor on a lovely afternoon of April and headed down the coast. The peculiar reef formation of the locality makes a wide detour to sea essential to prudent navigation, even in the best of weather, and the day was well spent, when we arrived in line with the two objects which mark the course of approach to the entrance of the harbor. These are the derricks of a salt-pumping establishment standing on the west side of the entrance, and a hump on the shoulder of one of the northward slopes of the lovely Waiainae mountains, nearly twenty miles to the westward which picturesque chain of hills, bathed in the haze of the tropic afternoon, form an element of combined beauty and grandeur in the landscape, of rare and striking excellence; and amid the mass Kaala, the giant of Oahu, lifts her verdure-clad peak 4000 feet to a close communion with the clouds. From the base of that chain eastward to the shores of Pearl Harbor, and of the outer sea, stretches a gently sloping plain, scarred and seamed by the torrents of centuries, but presenting, few or none of those scars to the observer from the deck of our craft.

With all available local knowledge and skill, the navigation of the entrance is studied with difficulties and dangers. A bar here, and outcropping of reef beyond; on this side a sand spit extending into the channel; and on the other rocky shoal, such is the succession of features encountered. But after some preliminary gratifying upon the coral, and some peling of our craft off the edges of sand spits, the deep water of the inner entrance was reached in safety, and gave opportunities for a survey of the surroundings, unembarrassed by the necessity of efforts to avoid immediate stranding.

From outside the entrance the view of Pearl Harbor is uninteresting and without notable feature. The scene in general, from the outside, is of a mass of shoal water, relieved by the foam of several lines of breakers, with flat expanses of and stretching away beyond to the Waiainae mountains on the westward, and to the Konahuanui range on the north. Nor does this scene materially change until, as suggested, the inner entrance is very near at hand. Then the change is sudden, pleasing, and in a degree wonderful. You see the low land which compresses the main artery of the entrance into a width of about four hundred feet. Just ahead is a stretch of deep water, about forty acres in extent, with gradually expanding shore lines, to east and west. But the central view is blocked, by the jutting, almost into the very gate of the harbor, of the foot of a long and irregularly shaped peninsula which protruded from the mainland at the northwest of the entrance a distance of nearly four miles, and forms the barrier which divides the West from the Middle Loch. The picture is most inviting, as we enter the harbor and confront the peninsula directly ahead; its abrupt sides laved by a lovely and narrow channel on the east leading directly north, to Middle and East Lochs; while an equally beautiful channel, almost a facsimile of the first, leads to the northwestward, and widens into West Loch, leaving the peninsula on the right.

West Loch, while bearing in a generally direct line from the entrances, is sinuous to a degree, and but slight progress into its mazes is requisite to show a completely land-locked harbor; with the low, rocky plateau of Paulea, Honolulu, and the peninsula about mentioned surrounding you at all points. The average width of the loch during the first two miles from the entrance does not exceed a quarter of a mile; it is sufficiently sheltered by the low surrounding lands with their thickets of algarroba to present an almost unrippled surface in all ordinary weathers. The black and gray rocks which form its peculiarly abrupt banks, with the vivid green of the algarroba fringe, the whole set in the majestic framework of the Waiainae and Konahuanui range of mountains combined with the opal hues of the water itself, comprise one of the most lovely pictures of this character anywhere to be found.

After two miles of a regular, and picturesque career, the West Loch becomes eccentric in its shores, curves and indentations, to a degree which renders description difficult and comparisons impossible. It sends an offshoot into the heart of the peninsula on the north, that almost cuts it in twain; while its main body extends to a width of more than a mile; its waters shoal gradually; and several small islands dot its surface. At a distance of less than four miles from the entrance the inner limit of this Loch is reached, where the rich alluvial land of Honolulu sloping with a gentle grade from the Waiainae mountains, form its shore.

Deep water prevails in the West Loch, which, except in its upper end, is exempt from shoals, during three miles on its course there is a uniform depth of 7 to 9 fathoms, except where a lava ledge crossing from a point of the peninsula reduces the depth to 6 fathoms during a very short distance; and these depths prevail as a rule, not only up to the shore, but in many localities extend for considerable distances under the projecting surface of lava rocks; and ships of the heaviest tonnage, if once introduced into this Loch, could in many places lie alongside the banks, and utilize the lave tableland for a series of quays.

May 10, 1895 (page 1)

The East and Middle Lochs.

What has been said of the West Loch in the way of general description applies with equal fidelity, save for some unimportant details, to the East and Middle Lochs. Returning to the entrance and rounding the point of the peninsula to the north-ward (looking out for a shoal that makes out from that body of land and greatly reduces the width and hampers the navigation of the channel leading to the two Lochs last named), we encounter, at the head of the channel, the large picturesque island of Mokuuumea or Ford’s Island, as it is locally
The Harbor's Defensibility.

Another reason advanced in favor of the acquisition of the Harbor is that it is so secure as to remove, or exclude all fears of it being tampered with by a hostile Power in time of war. It seems strange that anyone of intelligence can be found to advance that view, when the facts and the logic of the situation are so completely on the other side of the question. It is the most obvious of facts that, if the United States were once established in Pearl Harbor, she would be at the constant risk of losing it in case of war, with any power, unless her naval contingent in these waters should be so strengthened as to bid defiance to the strongest power that could be sent against her. In order to hold the Harbor, she must be able to repel all intruders. This she might do by a system of mines planted in the entrance, but such an expedient would suspend the navigability of the entrance, even by her own vessels; and render it valueless either as a
The fortification of Pearl Harbor has been discussed, and such project has been advanced as an argument to prove that it could be so defended from hostile attack. But a study of the conditions there existing will convince any reasonable man that fortifications sufficient to repel the attack of a modern naval power are impracticable: and that even if found feasible, they could be constructed only at a cost entirely out of proportion to the advantages to be gained hereby.

To begin with, there is no eligible site for a fort within modern cannon shot of the entrance to the Harbor. The land for many miles’ radius, varies in altitude from one foot to eight feet above high water; and this in a locality where the mean rise and fall of the tide is but one foot, seven inches. Though the outer and inner reefs should be covered with fortifications the most formidable permitted by the situation, yet nothing strong than stone and cement could be opposed to the hostile guns of an enemy, and how long would the most perfect construction of such materials, when placed as a fair target for such guns, be left intact? The same result would follow the construction of so-called forts on the land commanding the entrance. In order to command the approach of a hostile fleet, such edifices must themselves be exposed to the fire of that fleet; and, in the utter absence of anything in the way of natural defensive strength in the position, who so sanguine as to hope or believe in the efficacy of mere masonry, when opposed to the steel of modern ordnance?

As above intimated, the land in the vicinity lies very low, or purposes of defense. This remark applies equally to those within the harbor, whether Island or peninsula. There is absolutely no suggestion of a natural stronghold in the situation. And this fact could not only render impractical the efficient fortification of the entrance, but, granting for the sake of the argument, that the entrance could be secured, there is nothing to oppose the shelling of the inner works by the long-range guns now in vogue on naval vessels. A war vessel, lying end on to a fort at a distance of several miles, may present a very small target to the fort, – so small as to avoid mishap to the ship while being able herself to effectively attack not only the fort but also to throw destructive missiles past the fort and into the naval yard (supposing one to exist) beyond. And such, it seems to your correspondent, would be the condition of things, even in the event of the entrance to Pearl Harbor being effectively fortified; such course might, (though I do not believe it would) prevent the actual entry of a hostile craft, but could not protect the naval works which might be constructed in the lagoon proper.

May 11, 1895 (page 1)

The lands and their titles.

It is no unusual thing to find a land scheme behind propositions for the acquisition by the Government of any given piece of property for public use. Few navy yards have been established; few outposts offices erected; few forts
or arsenals built without the colored gentleman in the woodpile being unmasked; and such gentleman of color very generally stands forth as the advocate of a land owner or syndicate. And so it is in Pearl Harbor at the present time. There is a most patriotic desire on the part of diverse pretended citizens of America who have long since forsown their natural allegiance for the benefits of official salary in Hawaii, to confer upon their much beloved Uncle Samuel certain lands in and about the lagoon, in exchange for their aforesaid Uncle’s surplus gold coin. Of course, nothing could be more disinterested than the efforts of those patriotic gentlemen to make the desired exchange. Such is always the case. They are burning with ardor to see the flag of their native land floating over the placid waters of the lagoon, and are not only willing, but determined to promote that most worthy object—for a generous consideration. But before discussing individual cases and lands, a brief glance at the titles is desirable whose history is brief, and comparatively simple.

Prior to 1848, the feudal idea that all land is owned by the Sovereign, and all occupants hold under him and practically at his will, prevailed in its full vigor in Hawaii. But the advance of civilization among the aborigines, coupled with the material interests of the foreigners, then constantly increasing in numbers in the Islands, developed the necessity of a more liberal system of land tenure. Hence in the year mentioned, the reigning King, Kamehameha III, by virtue of the Royal grace which found expression in the act of the very primitively endowed legislature existing under the constitution then recently granted by the King, made the Great Mahele or Land Division to which all titles refer and which was the genesis of them all.

The prevailing idea involved in the Great Mahele was to make a division of the whole territory into three substantially equal parts, of which the King personally should continue to own one, the Government one and the people the third. It was fortunate for the Hawaiian race that Kamehameha was sufficiently ignorant and unenlightened not to have learned what the dominant party in Hawaii today assert and act up and act upon in their intercourse with the community respecting the definition of that much abused phrase, “the people.” Kamehamehna was sufficiently antique in his ideas to suppose that “the people” meant and embraced the whole body of his subjects, without regard to race, creed, color or previous party affiliation, to quote from the modern manifest of American politicians. But such back number notions find no place in the Government of today in Hawaii, whose votaries, when looking for a definition of the phrase quoted find it impossible to see beyond the little clique of aliens who, by the grace of Minister Stevens, were placed in the political saddle, on January 17, 1894, and have since entrenched themselves in their position, while “the people,” as elsewhere understood, and as formerly understood in Hawaii, contented themselves to await the answer of the United States to the protest against the Stevens aggression.

As usual in the case of a concession by a King to the people, Kamehameha did not neglect his own interest in this Division. He was both the King, and the sole Judge of lands he would “assign” to himself, as well as to the others in interest; and in that dual capacity, it would be strange indeed if his interests had suffered. The King selected a lot of lands, by their names, scattered over the entire group of Islands, and the Government’s portion was similarly assigned. Then there was created a Land Commission, for the settlement of the claim of private individuals, who were awarded for simple titles to such lands as they could prove they had previously occupied by the Royal assent or acquiescence, and exempt from feudal services or rental paid to any subordinate chief. Many thousands of claims were thus passed upon, in a manner satisfactory to the people, and characterized by a liberality of construction and presumed in favor of the occupant as opposed to the interest of the chief, quite at variance with the spirit of feudalism. The awardees of these claims were afterward granted Royal Patents of their land, upon the payment of almost nominal sums by way of commutation to the Government, but the theory of such commutation is not quite clear, seeing the Government had no valid claim to the lands so awarded.

The small holdings thus awarded were called kulaenas, and the word kuleana has since come into use indifferently to describe not only one’s right to a piece of land, but the land itself.

Of course the vast majority of the lands, in point of area, thus assigned to “the people,” were gobbled by the high chiefs, to some of whom vast extents were granted by virtue of their former exercise of dominion over the tenants thereof. The unit of land description is the ahupuaa tract invariably running from the sea to the crest of the mountains, beyond which other ahupuaas extend to the opposite shore. There is history written in this name, which is combined of the two elements “ahu,” a collection, and “pua,” swine; it having been customary in very ancient times for the chief holding an ahupuaa (those larger divisions were all held by the chiefs,) to render an annual tax or rental to the King of one swine for each ahupua under his dominion. The area of these ahupuaas differ widely, and while some include only a few hundred others embrace many thousands of acres. Thus the ahupua of Honolulu, lying between the Pearl Harbor Ledges and the crest of the Waianae mountains, contain over 50,000 acres.

Within the different ahupuaas are many kuleana, originally allotted to the peasantries. Next smaller than the ahupuaa, is the “ili” of which many are contained in the former division, and still smaller is the “mo“,” which may be more than a house lot or a taro patch. Each land, under whichever of these divisions, has its separate name, however small in area, showing a prodigious development of the bump of locality in the aboriginal Hawaiian.

The lands surrounding Pearl Harbor are comprised within comparatively few
Dr. Ford for whom it is so named. He secured the deed he went for, but was soon compelled, (or persuaded) to convey the Island to his wife, a mortgage upon whose other hands furnished the funds for the purchase.

That he had the contingency of selling the Island to the U. S. Government in mind sufficiently appears from the fact of his having given his vendor a separate agreement to pay him a further sum of Fourteen Thousand Dollars, in case he, Brown, should sell the Island to the Unites States or any other Government. As he is now supposed to have been in Washington, engaged in the endeavor to sell to Uncle Sam, and as Ford thinks he will come out at the small end of any deal which Brown may conduct, and the agreement for more money to be paid Ford upon the condition above mentioned was so drawn as to make it unrecordable under Hawaiian law, (as a means of notifying all the world of Ford's equities,) Ford is now stated to be about to begin suit to declare his position and interest in the Island.

The fact that Mr. Brown has most persistently devoted himself to the entertainment of Admirals Irwin, Walker and Beardslee during the last years and that his swell dinners to the officers mentioned are famous lends color to the belief that there may be some understanding between him and them in the premises.

The vicinity of the Harbor is not destitute of other little land projects whose advocates look through a vista having the U. S. Treasury at the other end of it. There is a variegated boom right on the Pearl City Peninsula, so called for the reason that no "city" is apparent in the locality. That imaginary city was laid out by the Oahu Railway & Land Co., a corporation running a little railroad from Honolulu to Ewa Plantation, a distance of about 15 miles, most of which skirts the lagoon. The original "city" was platted on the uplands, running from the shore of the Harbor to the mountains several miles away. It was intersected with avenues bearing names that sooth, and streets bearing names that jingle, and a crowd of suckers were one day corralled in an auction room, hypnotized by the auctioneer, and the lots were sold off in a trice at figures that would create a boom in Denver. This was several years ago. The lots are still there, and as vacant as ever, for the most part. The projector of that scheme, in showing his imaginary "city" to an irreverent visitor one day, remarked that the one needful to make Pearl City great and prosperous, was a plentitude of water, interspersed with good society; to which the visitor replied that Hades needed even less, as it had good society.

Having worked the uplands for all they were worth, the ardent projector moved his paper "city" down upon the Pearl City Peninsula, and laid out more lots, and parks, and avenues than would grace a railroad center in Ohio. After much effort he succeeded in giving some of these away to certain speculators, and swapped a few more for different kinds of old junk. The one investor, has built several cozy cottages, for which there are no tenants, and a school house
for which there are neither teacher nor pupils, and a church for which there are no worshipers; while some other owners, to a total of less than a dozen, have built little camping-out cottages which they sometimes occupy, and so the Peninsula section of Pearl City stands. Of course each lot owner has an axe to grind, and wants to grind it at the United States Treasury. Each thinks he sees a fortune in his few square feet of soil, in case of the establishment there of the much desired naval station. Though few in numbers, they are fitted with full lung power, and make a good deal of noise when prating of the advantages, (to Uncle Sam, of course,) of such an establishment. But such philanthropic schemes are all alike, in their main features and symptoms, and the American public, having seen so many need little details of description as to this one.

From Pearl City eastward, and around to the entrance to the Harbor, the land is variously owned. The Railway Company, the Crown Land Commissioners, the great Bishop Estate, and the estate of the late Queen Emma, (devoted to the support of the Queen’s Hospital in Honolulu,) hold the larger tracts; and, strange to relate, there is no symptom of a land boom, or of a scheme to unload upon Uncle Sam visible in these localities.

**May 13, 1895 (page 1)**

**But what about the entrance?**

The surveys of the Harbor conducted by the United States navy have presumably been done with a view, looking to its practical utilization. Much of the foregoing article has been devoted to a discussion of the interior of the lagoon. But whatever the advantages of the interior, they must first be reached, in order to be utilized. As above shown, there is no present possibility of conducting any but the smallest craft into the harbor, owing to the shallow and tortuous entrance.

It has been long supposed that the outer shoals were under laid with hard coral and lava rock, and that the process of opening a channel would involve elaborate and expensive blasting operations. But that theory has yielded to some practical experiments, conducted by the naval officers, and which reveal the fact that the material underlying the areas of shoal water off the entrance is nothing more or less than sand; considerably encrusted and hard packed, in places, but still only sand. The manner of the demonstration has been to set up a derrick at different points off the entrance, as the framework of a sand pump, consisting of a four-inch pipe fitted with sand valves and plunger; to pump the sand and water from the bottom of the pipe, which would continue to wattle as the pumping progressed until a depth of 32 feet had been reached at each point of operations.

Lieutenant Max Wood, of the U. S. S. “Philadelphia,” a most experienced officer under whose command those experiments were conducted, is understood to have written a report in which he sustains, in enthusiastic terms, the feasibility of dredging the entrance, by cutting a ditch or a channel through that great sand bed for a distance of about two miles and so opening the Harbor to naval and commercial crafts. It is further understood that Lieut. Wood thinks that such channel would not be in danger of filling up, but that on the contrary, the section of the tides would exert a scouring effect upon the ditch, and keep it from becoming choked. But this sanguine view is not shared by those whose experience in these waters entitles their opinions to respect. Those who oppose the Lieutenant’s views, to the very feeble tidal action of these latitudes, as compared with these further north or south. As before mentioned, the mean rise of the tide at Pearl Harbor is but one foot seven inches. It follows, therefore, that no such volume, and consequently, no such force of water would sweep through the proposed ditch, as though the rise and fall of the tide were six to eight feet, a moderate figure in more northern climates.

But if we take it for granted that the sand will shift with the tidal current, it must be remembered that the tide runs in before it runs out, and the incoming tide must be reckoned with, as well as that outward bound. It seems to your correspondent that the experience of the last few years is against the view advanced, or supposed to be advanced by Lieut. Wood. Take for instance the Golden Gate, and Carquinez Straits, between the Sacramento River and San Pablo Bay. The Sacramento is a mighty stream, In it the tide rises to a height of six feet as high up as the Delta of the San Joachim. And yet, in the case of the “slickens” or debris from the hydraulic mines, although so light as to be held for a great part in solution, it settles along the entire course of the river, until Suisan Bay has become almost un navigable, and the navigability of Carquinez Straits is seriously threatened, while a well-grounded apprehension exists as to the filling up of the whole of San Pablo and San Francisco Bays, and even the Golden Gate itself. If, then such conditions can exist and grow along the course of the Sacramento, in spite of the tremendous tidal force there constantly exerted, what can be hoped for at the mouth of Pearl Harbor? There are other examples along the western coast of America. All navigators know that the entrance to Humboldt Bay changes with each storm, if not with each tide and the same is true, though perhaps in a lesser degree, of the Columbia River entrance. Who would maintain for a moment that a ditch, cut through either bar last mentioned, could be found the next morning after a heavy tide? And yet, if Pearl Harbor is to be opened and kept open, it must be done under conditions less favorable to the project, in some material respects, than prevail at either Humboldt Bay or Columbia River. Here the sand shoal extends two miles. There is a storm of periodical occurrence in these waters, called “konas,” from the fact of its coming from the south, - that being the “kona” or lee side of the islands. That is the most furious of all our storms, and the mouth of Pearl Harbor is peculiarly exposed to it, after its sweep across the sand shoal referred to. It is the opinion of excellent judges here that, even were such a ditch dug through the sand shoal to the Pearl entrance, and though it should be kept open by tidal action, or other forces, in ordinary weather, – yet, upon the occurrence of one of our “konas,” it would be filled to its banks, during
much of its course, by the sand that had been dug to make it, and other sand carried in by the force of the storm. And such is the opinion of your correspondent.

No doubt the recent deepening of the bar to Honolulu harbor will be cited in favor of the feasibility of the program named, but the parallel will not hold good between the two localities. At the Honolulu bar, the dredging operations merely involved the shoving off of the hump of a hillock of sand, whose sides descended precipitously, inshore and offshore, to deep water, and requiring a cut loss that two hundred yards in length. That work has stood the test up to date. But if it has been a ditch through two miles of almost level sand bed, sloping gradually for that distance into deep water, it would have been as it is at Pearl Harbor, a very different story.

5.4.3 United States Congressmen and Committee Members Visit Pearl Harbor to Investigate Condennation and Military Development

The Pacific Commercial Advertiser
At Pearl Harbor. Distinguished Visitors Examine the Locks. Delighted with Situation – Grandly Entertained at Waipio Luau. President Dole One of the Party. Visit to Ewa Plantation and Mill.

September 22, 1897 (page 1)

At 7:30 yesterday morning Mr. Dillingham was ready at the railway station with a special train for Waiau, but Representative Cannon stopped somewhere to get a cup of coffee, and so delayed the train for 10 minutes, but at the end of the coffee delay the special pulled out with two cars containing Honoluluites bent upon seeing Senator Morgan and Representatives Tawney, Berry, Cannon and Laudenslager everything connected with Pearl Harbor.

Next to Mr. Dillingham, who looked after the details of the railway end of the program, John Ewa, vice-president of the Inter-Island Steam Navigation Company, was most interested in the time schedule. He had dispatched the little steamer Kaena to Waiau at a quarter before 7 with instructions to make the destination by 8 o’clock, so that when the locks were reached he scanned the horizon with considerable apparent anxiety, which was relieved as the train drew up to the station and the white hull of the Kaena was seen making her way into the harbor. Captain Parker was in command, and Star Kapu acting as pilot. By skillful management the steamer was brought to the wharf, and the passengers, to the number of forty embarked for a tour of the locks.

Minister Hatch and Surveyor Dodge were provided with maps of the harbor, showing soundings, and these were displayed to the members and thoroughly explained. The steamer went through every part of the harbor, visiting the different lochs, at times going close enough to the shore to enable the passenger, who might desire, to toss a biscuit to anyone there. Frequent soundings were taken, the line showing a depth of thirty feet within a few feet from shore. As the different points of interest were pointed out to the visitors and commented upon by the Government officials and members of the committee, the interest of the guests increased and at the end of three hours steam, the party disembarked at the Peninsula and walked to the special train, which had left the city at 11 o’clock.

On this was another committee and a hundred or more representative citizens who had journeyed out to join the party and conduct the members to Waipio, to the residence of Mrs. C.A. Brown, where an elegant luau had been prepared. The tables were set on the lawn under an awning and were loaded down with genuine Hawaiian dishes. Mrs. Brown was a most agreeable hostess and presided over the table with her usual grace. To many of those present the feast in native style was an innovation and some of the dishes will ever remain a mystery. Colonel Berry, the six feet five inches of good nature pronounced it the finest “luu” he had ever sat down to and when his Hawaiian was corrected, he promptly answered “Gentlemen, you can call it what you wish; down in Kentucky, when we have anything real good we call it a “luu” this feast is what I call a genuine “luu.” And having so expressed himself he wandered off in the direction of the spot where the Quintette Club was singing “Just a plain Hawaiian girl is good enough for me.”

The only incident to mar the pleasure of the visitors was the sudden and distressing illness of Mrs. Dewener, wife of Congressman Devomer of West Virginia. From a fainting spell it developed into more serious illness and Dr. Herbert was summoned to her side, and gave her all of his attention after arrival. For an hour or more after dinner the party divided into groups and wandered over the grounds…

Throughout the day there were many expressions of wonderment at the magnitude of the harbor and the condition of the country. Even those of the Representatives who were sufficiently interested in Hawaii to consult guidebooks and maps of the Islands before coming here, were surprised to find such a perfect and safe harbor. Representative Cannon, who studies minuteness of detail, where appropriations for rivers and harbors are concerned, with the thoughtfulness which characterizes a Senator, pronounced Pearl Harbor one of the best he had seen. Replying to a question by a reporter for this paper, Mr. Cannon said: “The harbor is an excellent one, but whether we want to go to the expense of dredging and fitting up a naval station is another matter. It is a question whether the United States does not need other places just as much as Hawaii. We recognize Pearl Harbor as our property, no matter what happens. It was given to us by treaty, and we have paid for it 10 times over by free sugar.”

Representative Berry, when asked his views of the Islands generally and Pearl
Harbor particularly, said: “They surprise my fondest expectations, though I had stored up a lot of information regarding the country. Our visit has been unannounced, and from the moment we stepped on shore we found ourselves among so many friends that it is hard to realize that we are in a foreign country. Do I consider the Islands suitable to become United States territory? Well, I have inclinations that way.”

Representative Tawney of Minnesota expressed himself as delighted with his visit and regretted his departure. He said he had found the Islands a garden spot, and what he had seen suited him in every way.

Representative Laundenslager, who represents the Sixth New Jersey District in Congress, comes from Paulsboro, New Jersey. He gave his services to his State when quite young, and was elected County Clerk, a position which he filled with such satisfaction that his constituents insisted on sending him to Congress. In speaking of his trip yesterday, he said to some friends: “We were in Chicago when the subject of Hawaii was brought up, and someone in the party remarked that they would like to make the trip. When we compared notes our desires were found to be similar, but it was not at that time thought possible that any of us could make the journey. After we had gone out to the Pacific Coast the subject was again brought up, and on our return from Monterey we decided to telegraph to our homes and see if we could be spared another month. The answers came back only a few hours before the departure of the Australia. We secured our tickets, and here we are. This is the first time I have ever been in a foreign country, and I can assure you, gentlemen, that I cannot realize, even now, that I am away from the United States. The people here are American and the customs are American. I am delighted with the place and the people. Our stay has been made one continual round of pleasure and the good friends who have taken charge of us do not seem to know when or where to let go.”

The party will be taken in carriages this morning at 9 o’clock to the Station House, where the police will be drawn up for inspection. Afterward a visit will be made to Oahu jail, and at 4 P. M. they will depart on the Australia. Those who have been active in contributing to the pleasure of the distinguished guests since their arrival are, besides Government officials, J. B. Atkinson, J. A. Kennedy, T. F. Lansing, John Eula, C. L. Wight, W. R. Sims, F. B. McStocker, B. F. Dillington, H. W. Schmidt, James A. Low, E. D. Tenney, Consul-General Haywood and Minister Sewall. Besides these gentlemen, some of whom served on the various committees yesterday, Mrs. E. K. Wider, Mrs. C. A. Brown and several others have done much in a social way to convince the visitors that plenty of genuine American hospitality may be found in the Island of the mid-Pacific.

5.4.4 The Navy Department Engages in Assessment of Pearl Harbor (1899)

Evening Bulletin
Pearl Harbor and the Army
March 31, 1899 (page 1)

Washington, Mar. 24. - The Navy Department had been requested to turn over all data concerning Pearl Harbor, in the Hawaiian Islands, the Engineering Corps of the army.

The Navy Department made the first surveys in this harbor, but the improvement of the harbor will be under the supervision of the War Department. It is understood that Major Langhilt of the corps of engineers, who has been making survey there, will be placed in charge of the important work of improving the harbor.

Navy and Pearl Harbor Lands

October 4, 1899 (page 1)

The United States tug boat Iroquois, Lieut. Pond commander, returned this morning after an absence since last Friday during which time stops were made at Lahaina, Maui, Kealakekua Bay on the Kona coast and Hilo. Captain Merry, commandant of the Naval Station here, was the only passenger in the Iroquois. In fact, the tug boat went out at his orders, the idea being to make the circuit of the islands of Maui and Hawaii for the purpose of inspecting various places with an eye to sending information to the United States Government. Captain Merry was seen at his office this forenoon and, in response to questions asked by a Bulletin reporter, gave out the following:

"No, the United States Government has no particular design so far in regard to harbors, but information has been asked for by the authorities and for that reason alone I made the trip in the Iroquois.

"Neither Lahaina nor Kealakekua can be recommended as places for harbors. A few hours inspection proved that very conclusively.

"When you come to Hilo it is a different matter. With the building of a crescent shaped breakwater (a matter of very little trouble) a very fine harbor could be produced. This information will, of course, be sent forward.

"We remained in Hilo two days and the whole situation was studied carefully.

"As you know, my first intention was to go to Kauai, the Garden Isle, but this was changed. From what I saw on the coasts of Maui and Hawaii, a trip to Kauai will not be necessary."
The Pacific Commercial Advertiser

Change in Hawaii – Something About the Appointments.

May 18, 1900 (page 3)

Washington, May 6. – From the time the passage of the bill creating the new Territory of Hawaii became a certainty, there has never been any good reason to doubt that President McKinley would name President Dole as the as the first Governor...

The Secretary of the Navy is entirely convinced of the wisdom of hastening the work of improving Pearl Harbor with the object of establishing a naval station, and has recommended that the sum of $100,000 appropriated for that purpose in the river and harbor act of March 3, 1899, be transferred from the jurisdiction of the War Department to that of the Navy Department, by which he thinks the work can be better done. It will be remembered that Rear-Admiral Walker, U.S.N., reported favorably on this project as long ago as July 11, 1894, to the Fifty-third Congress. Since then the surveys have all been made by the Navy, but the site for the naval station has not been acquired.

Senator Hale of Maine, chairman of the Committee on Naval Affairs, has taken up the matter and has introduced a bill covering the whole subject. It authorizes the Secretary of the Navy to acquire immediately by purchase or condemnation proceedings, for the purpose of establishing a naval station in Pearl Harbor, the following tracts of land, aggregating 1880 acres:

The Island known as Mokuaime or Ford Island, comprising about 370 acres; the peninsula tract of Waipio of about 820 acres; a tract comprising about 383 acres lying to the eastward and fronting upon the entrance of the harbor [Halawa]; and a tract of about 303 acres lying to the westward and fronting upon the harbor entrance [Puuloa at Honolulu]. For these purposes $150,000 are to be appropriated. For the purpose of dredging and improving the channel leading to Pearl Harbor. In order to provide safe entrance for vessels up to 6000 tons displacement, $40,000 1s to be appropriated to be expended under supervision of the Navy Department, in addition to $100,000 previously appropriated for expenditure by the War Department. None of these appropriations for dredging are to be available until title to the lands required for the naval station shall have been acquired.

5.4.5 U.S. Senate Bill Pursues Pearl Harbor Naval Station, Acquisition of Land and Dredging (1900)

The Hawaiian Gazette

Pearl Harbor – Text of Bill for Making a Naval Station Provides for the Acquisition of Lands and Rights, and for Dredging.

May 29, 1900 (page 6)

The following is the full text of the bill introduced Into the Senate of the United States on April 20, by Senator Hale:

A Bill to provide for the acquisition by the United States of lands and rights therein necessary to the establishment of a naval station in Pearl Harbor, Island of Oahu, Hawaii, and for the dredging of approaches to said harbor.

Be it enacted by the Senate and House of Representatives of the United States of America, In Congress assembled, That the Secretary of the Navy be, and he
is hereby authorized to acquire, immediately upon the passage of this Act, by purchase from the owners thereof or by condemnation in pursuance of the provisions of chapter ninety-nine, eminent domain, civil laws of the Hawaiian Islands, for the purpose of establishing a naval station in Pearl Harbor, Island of Oahu, Hawaii, certain tracts of land, containing in the aggregate one thousand eight hundred and eighty-eight acres, more or less, as may be required, said tracts being situated within the limits and upon the shores of said harbor and upon the shores of the entrance thereto, namely:

- First, the island known as "Mokuumeume," or "Ford Island," comprising about three hundred and seventy acres;
- Second, the peninsula tract known as "Waipio," comprising about eight hundred and twenty acres;
- Third, a tract comprising about three hundred and eighty-five acres lying to the eastward of and fronting upon the entrance to said harbor [Hālāwai];
- Fourth, a tract comprising about three hundred and five acres lying to the westward of and fronting upon the entrance to said harbor [Pu'uloa in Honolulu]; together with all riparian and fishing rights and other easements in and upon said properties necessary to be acquired in order to the free and unrestricted use of the lands for naval purposes by the United States, and all rights of way in and upon adjacent lands necessary to provide convenient access to the here afore-mentioned tracts; and for each and every purpose connected with the acquisition of the lands aforesaid the sum of one hundred and fifty thousand dollars or so much thereof as may be necessary, is hereby appropriated out of any moneys in the Treasury not otherwise appropriated.

Sec. 2. That the Secretary of the Navy be, and he is hereby authorized immediately upon the passage of this Act, to establish port warden or harbor lines in Pearl Harbor and the channel leading thereto; to make such other regulations as may be necessary for the protection of the interests of the United States naval station in said harbor, and to detail an officer of the navy as supervisor of the harbor, whose duty shall be to see that the harbor lines as established, and such other harbor regulations as may be made from time to time by the Department, are duly observed and respected.

Sec. 3. That for the purpose of dredging and improving the channel leading to Pearl Harbor, in order to provide safe entrance thereto for vessels of six thousand tons displacement and under, the sum of four hundred thousand dollars is hereby appropriated, out of any moneys in the treasury not otherwise appropriated, such sum to be expended under the supervision of the Navy Department, and to be in addition to the sum of one hundred thousand dollars heretofore, by Act approved March 3d, 1899 (United States Statutes at Large, vol. 30, page 1133), appropriated for such purpose, which sum is hereby transferred from the War Department to the Navy Department for expenditure in pursuance of the provision of this Act. Provided that the appropriations made by this section for dredging shall not become available until the lands required for the purposes of a naval station in Pearl Harbor shall have been condemned, or title thereto otherwise acquired by the United States in pursuance of the provisions of Section 1 of this Act.

5.4.6 Report on Advantages of Development of Pearl Harbor at Waipi'o Peninsula and "West Loch," Moku'ume'ume (Ford's Island), and the Honouliuli-Pu'uloa and Hālawa Shoreline Channel Lands (1900)

**The Pacific Commercial Advertiser**

A Naval Station Report on Pearl Harbor's Advantages.

June 27, 1900 (pages 1 & 3)

...Pearl Harbor can be successfully defended, rendering its anchorages safe from outside attack, and that it possesses a comparatively large deep-water anchorage, capable of expansion, if needed. And it should also be borne in mind that it is the only defensible harbor within the entire Hawaiian group.

The board has, with careful consideration, approached the subject of improvement and reached its conclusions, keeping ever in mind the present and prospective needs of our country in this part of the world. The great expansion of American interests in the waters of the Pacific, as a result of recent events, has caused each point considered to be weighed carefully from every standpoint.

8. The board proceeds to answer the questions submitted by the Department's order, as follows:

(a) What land is it necessary and desirable to acquire In order to establish a naval station in Pearl Harbor, having in view the present and prospective needs of such a station.

The board recommends that for the purpose of establishing a naval station in Pearl Harbor, having in view the present and prospective needs of such a station, that the Government acquire the portion of the body of land shown on
plan No. 1, accompanying, as Waipio peninsula, extending from the narrow
neck marked with a blue line to the southernmost point of the peninsula,
comprising to low water mark, about 650 acres, also the body of land shown
on plan No. 1. As Mokuaime or Ford’s Island, comprising to low-water
mark about 371 acres, inclining the adjacent islets and the Intervening shoal
water.

9. The board is of opinion that under the general term naval station must be
included the following: Dry docks, work and repair shops, a coaling station
of large capacity with sheds, coal pockets chutes, and sheltered anchorages or
berthing space for tugs, lighters, etc., extensive grounds for marine barracks
parade grounds, and a still larger area for drilling large bodies of sailors or
marines, to which must be added ample camping ground for any naval force
that might be rendezvous here in time of war. Considerable space will be
needed for hospital accommodations with surrounding ground. Ample space,
suitably selected, must be set apart for magazine purposes. All the above
mentioned must be capable of expansion as our future naval needs may
demand.

10. In selecting the two plots of ground above mentioned for naval purposes
careful consideration has given to the present commercial needs with possible
greatest expansion, and there has been left free for commerce the entire main
shore line within the entrance, several miles in extent, and situated where it
is most likely to be of the greatest use. It may also be stated that of the two bodies
of land decided upon as required for naval purposes, the Waipio peninsula was
former penal observation chosen by Rear Admirals Irwin and Miller and
Commanders Nichols and Merry in past years, but the present developments
had not then been reached, and the board is of opinion that the area
recommended by it is not in excess of Government needs, present and
perspective. The Waipio peninsula lands recommended are from ten to thirty
feet high and covered with algaroba trees. The thin alluvial soil is reported to
be incapable of growing sugar cane except in certain spots “of small area, and
then only by copious irrigation.”

To take this land would, therefore, cause little or no detriment to agricultural
interests. For naval purposes this peninsula presents many advantages. Deep
water channels surround it on nearly all sides, making it almost an island. It is,
therefore, practically isolated from the mainland, and yet is connected with it
by a narrow neck, assuring easy communication. The shores are clear of reefs,
and bold water is found close to the shore line, thus minimizing the expense of
probable shaft and dock construction and affording ample wharfage for a
fleet of large and small vessels. The West Loch and Walker Bay [Waipio] would
afford excellent shelter and anchorage for small vessels, while the middle
channel and loch would give good anchorage for the largest ships.

The prevailing winds in this locality are from northeast to east, making the
eastern shore of the peninsula a weather shore. The winds are never so strong,
however, but that fairly smooth water exists all times. The “konas,” strong
southerly and westerly gales, are said to occur at times in January and
February, lasting from a few hours to two or three days, but never attaining a
violation which would make anchorage in the harbor unsafe. The Oahu
Railroad passes the head of the peninsula, and only a short spur would be
required to reach the site of a dockyard over perfectly feasible ground. The
neck of the peninsula, just above the sites recommended by Rear Admirals
Irwin and Miller for a dry dock, are narrow enough to make it possible to locate
repair shops and store houses near the probable dock site, convenient to
vessels at the docks or anchorages on either side.

Ford’s Island is chosen because of its proximity to deep water anchorages of
the greatest area for large ships, and being an island, it is peculiarly available
for barracks for a strong force of marines and as sites for magazine, hospital
and coaling docks. Its shores, like those of Waipio Peninsula, are for the most
part easily accessible for large ships in going alongside wharves, which latter
can be constructed at small expense. Its leeward or westward shore is
particularly suitable for the location of coal storage houses and coaling
wharves or piers. Good potable water in sufficient quantity for all the above
purposes is reported to have been found on this island by sinking an artesian
well and from the fact that great quantities of fresh water have been found on
the northern part of Waipio

Peninsula and on the land’s surrounding the harbor there is no reason to doubt
that an all sufficient amount can be obtained by the same means on the lower
or main part of the peninsula. Water options are held, furthermore, by the
present owners of the Waipio lands for the supply of water for irrigation
purposes.

11. “(b) What land is it necessary and desirable to acquire for defensive
purposes of the harbor, channel and station?”

“(c) What land, if any, is it necessary and desirable to acquire from private
parties to obtain the requisite facilities of ingress and egress?”

The board is of opinion that for clear explanation the queries under b and c
may be best answered under one heading, and in so doing invites attention to
plan No. 1, whereon is shown, below the Waipio Peninsula and at the entrance
proper to the harbor, a certain body of land embraced on each side of the
channel by a blue dotted line extending down the channel, thence eastward
and westward, respectively, to a fixed point on the shore line. These two tracts
of land the board recommends be selected for defensive purposes of the
harbor, channel, and station, and also for securing requisite facilities for
 ingress and egress.
12. The land lying along the line of the channel is selected in order to prevent any possibility of interference with the ultimate channel of navigation, which may in the future extend from shore to shore in this part of the narrow pathway. The wide areas nearer the shore line are intended for the emplacement of batteries to guard the entrance, to keep an enemy at a distance from the shipping within, for covering the mine fields, etc. The total area thus recommended to be acquired comprises about 690 acres. It may not be necessary that the acquisition of any of this area should in anyway interfere with or cause the removal of any existing private improved properties lying within the boundaries; but the board desires to call attention to the very great importance of the Government acquiring an absolute title to the same and of holding it in fee simple forever. This done, permission may be granted for improvement, subject to war necessities as to their removal or destruction without damage to the Government, as is done within the reservation of Fortress Monmoe.

13. For the purpose of securing easy and convenient access to all of the above land recommended to be purchased for Governmental use the board recommends that sufficient right of way, not less than 100 feet in width, should also be purchased for Government use, extending from the naval station to such [page 1] public roads and railroad as may be considered most desirable.

14. "(d) What are the best methods for acquiring the above-mentioned land?"

The board recommends that all of the above-mentioned lands be acquired by condemnation under the law of eminent domain of the civil laws of the Hawaiian Islands, a copy of which is appended, marked "C."

...23. Regarding the value of the lands recommended to be acquired. — From the data placed before the board in the shape of reports, assessed values of land as given by the assessor in 1899, records of options offered, and taking into consideration the Hawaiian law of eminent domain, the board is of the following values should obtain:

- Waipio Peninsula, about 820 acres, assessed at $25,000 in 1898, and adding 20 per cent...... $30,000
- Ford's Island, about 370 acres, assessed at $20,000 in 1898, and adding 20 per cent...... 24,000
- Land on east side of channel, about 305 acres, at $20 per acre, plus 20 per cent [Halewa]...... 7,320
- Land on west side of the channel, about 385 acres, at $50 per acre, plus 20 per cent [Pu'uloa]...... 23,100

Total...... $82,420

There was controversy over condemnation of lands from various large land owners. Notable the Bishop Estate, Honolulu Sugar Company, and Tī Estate sought relief from the taking. The local papers provided details of court proceedings to island readers, as in the articles below.

*The Pacific Commercial Advertiser*

**Land Fight Is Now On – Pearl Harbor Site Suit Summons Served.**

Lessees As Well As Owners In It – Halawa, Kualua and Ford's Islands the Bone of Contention.

**July 17, 1901 (pages 1-3)**

All the parties to the condemnation suits brought by the United States Government to secure those lands about Pearl Harbor which are to be used for the proposed Naval Station, were served yesterday with summons calling upon them to appear within twenty days and answer the petition in the suit. The papers were served by Deputy Marshal E.R. Hendry, and the wait between the time of the filing of the papers, July 6th, and their service has resulted in the finding of all the parties in the city.

The summons were directed to the following: Estate of Bernice Pauahi Bishop, deceased; and Joseph O. Carter, William F. Allen, William O. Smith, Samuel M. Damon and Alfred W. Carter, trustees under the will of Bernice Pauahi Bishop deceased and the estate; the Oahu Railway & Land Company, the Dowssett Company, Limited, the Honolulu Sugar Company, the Honolulu Plantation Company, Choow Ah Fo, the John II Estate, Limited, William G. Irwin, Oahu Sugar Company, Limited, and Bishop & Company. This comprises all the owners of the lands which are sought to be condemned and all those who claim any interest in the lands. There are several lease-holds as will be seen from the names of some of the parties defendant to the suit, and these are included, as it is the intention of the Government to seek to obtain possession at once.

The fight which is begun by the serving of these papers promises to be one of the most hotly contested that has been known in the United States courts since the annexation of the Islands. The entire tract covered by the suit comprises 829.1 acres. This is distributed as to ownership among the two estates principally, the larger portion being in the Bishop Estate lands, the Halawa district, and the Island known as Kualua, making a total of 696.5 acres. The
portion which is the property of the [illegible] is the eastern half of Ford’s Island, that portion which lies adjacent to the Halawa lands mentioned. In the portion of the Island which the United States wants there is a total of 151.8 acres.

Of the lands of the Bishop Estate there is a quantity which is not highly productive, being described in the complaint, as being “covered with algaroba and bushes.” This is that portion which runs from about Keanapuaa Point around to the line of the railroad. Other portions of the land are comprised in the Honolulu plantation and again others are used for rice fields and fish ponds.

Perhaps the most valuable lands of the entire area are those on Ford’s Island. This forms part of the Oahu plantation, there being now a large crop of cane on the lands. The valuation placed on the lands by the Government is $1,680. That there will be a hard fight put up by the owners of the property goes without saying. The suit is entered in the name of Charles F. Pond, the present commandant of the Naval Station. The petition in the action is as follows:

United States of America, District of Hawaii.
In the District Court of the United States in and for the District of Hawaii.
The United States of America, plaintiff and petitioner, vs. Estate of Bernice Pauahi Bishop, deceased; and Joseph O. Carter, William F. Allen, William O. Smith, Samuel M. Damon and Alfred W. Carter, trustees under the will of Bernice Pauahi Bishop, deceased; and of the Estate of said Bernice Pauahi Bishop, deceased; and Oahu Railway & Land Company, a corporation; and The Bowesett Company, Limited, a corporation; and Honolulu Sugar Company, a corporation; and Honolulu Plantation Company, a corporation and Chow Ah Fo; and John li Estate, Limited, a corporation; and William G. Irwin; and Oahu Sugar Company, Limited, a corporation; and Bishop & Co., a co-partnership defendants and respondents.

Petition.
To the Honorable the District Court of the United States of America in and for the District of Hawaii.

Now comes your petitioner, the United States of America, named hereinabove as plaintiff and petitioner, and represents, avers, alleges and shows as follows to wit:

That, according to law, your petioner was and still is invested with the power, right and capacity to purchase, acquire, condemn and hold all such real estate wherever situated within its jurisdiction, as may be, for any purpose, necessary to the due exercise of its powers and duties; and in pursuance of and to said power, right and capacity, said plaintiff and petitioner has been and is now desirous of purchasing, acquiring, condemning and holding those certain tracts and parcels of land, and their appurtenances, situate, within the limits of the aforesaid district and hereinafter more particularly described, for the erection and maintenance thereon of a naval station and harbor and channel defense, a public use to and for which the said tracts and parcels of land are necessary and indispensable.

That the aforesaid tracts and parcels of land and their appurtenances, so to be purchased, acquired, condemned and held for the purposes aforesaid, are, each and all of them, situated in the District of Ewa, in and about the harbor of Pearl Lochs, sometimes called Pearl Harbor, in the Island of Oahu, in the Territory and District of Hawaii, in the United States of America, and are bounded and particularly described as follows, to wit: First: Two portions hereinafter referred to respectively as Portion A and Portion B, of the Estate of Bernice Pauahi Bishop, deceased, sometimes called B.P. Bishop Estate, which are shown on that certain map known and designated as “Hawaiian Government Survey Registered Map No. 1739,” [see Figure 1] and in this behalf your petitioner shows that said portions (A) and (B) are bounded and particularly described as follows, to wit:

Portion A—Comencing at a point on the shore on the eastern side of channel which leads into Pearl Lochs, where the northern shore of the second fish pond below Keanapuaa Point, as shown on chart No. 1800 published by the Hydrographic Office of the United States Navy department [1873, LoC Map Catalogue No. c008087], joins the low-water mark of the said channel; thence following the shore to the northward along the line of low water to the said Keanapuaa Point, or Keanapuaa, as marked on said chart; thence following the shore along low-water mark in a general easterly direction to what is shown on said chart as Southeast Loch, and along low-water shoreline of Southeast Loch to the point in the northern arm of Southeast Loch where the low-water shore line touches the wall shown on the said chart as extending in a southeasterly direction from the southeast corner of Loko Kunana; thence in an easterly direction along said wall to its end; thence east, magnetic to the line of Oahu Railway, thence across said railway and in the same direction, to wit, east, magnetic, eight hundred (800) feet distant from the center of said railway line to a point; thence south 22 1/2 degrees east, magnetic, to the general southern boundary line of the Estate of Bernice Pauahi Bishop, deceased, sometimes called B.P. Bishop Estate, as shown on the aforesaid “Hawaiian Government Survey Registered Map No. 1739”; thence along the said boundary line in a southerly direction to where the said boundary line touches the said Oahu Railway, and partly across the said railway in the same direction to its center line; thence still in a southerly direction, but more westerly, across the said railway and continuing in the same direction to a point at about the middle of the eastern shore of the said second fish pond below the said Keanapuaa Point; thence along the shore of the said fish pond to the northward and to the westward to the point of commencement; comprising to high-water mark about six hundred and thirty-five (635) acres,
more or less; together with all water, riparian, fishing and other rights, and
ing rights of way and other easements, incidental or appurtenant to the said
portion (A).

Portion B—The whole of that certain Island shown upon the aforesaid
Hydrographic Office Chart No. 1800, and known and designated as Kualua, to
low-water mark and comprising to high-water mark and comprising to high-
water mark about 41.5 acres, more or less, together with all water, riparian,
fishing and other rights, and rights of way and other easements, incidental or
appurtenant to said portion (B).

Second—A portion of the estate of the John li Estate, Limited, a corporation,
said portion being a part of that certain Island shown upon the aforesaid
Hydrographic Office Chart No. 1800, and known and designated as
Mokuaume or Ford Island, said portion being bounded and particularly
described as follows, to wit: Commencing at a point at low-water mark on the
shore on the southwest side of said Mokuaume, or Ford Island, as shown
on said Hydrographic Office Chart No. 1800, published by the United States
Navy Department, the said commencement point being about six hundred and
forty (640) feet to the northward of the central portion of the southernmost
point of the said Island, and between the said southernmost point and the
beach marked on the aforesaid chart as Kaimaeae; thence north 25 1/2
degrees east, magnetic; thirty-one hundred and sixty (3,160) feet, more or less,
to a point; thence about north 55 degrees east, magnetic, to the extreme
northeast point of the said Island to low-water mark; thence to the southward
and following the general southerly and southwesterly shore of the said Island
along low-water mark, including outlying rocks, points and islets, to the point
of commencement, comprising to high-water mark about 151.6 acres, more or
less; together with all water, riparian, fishing and other rights, and rights of
way and other easements, in- (continued on page 2) cidental or appurtenant
to the said portion.

And in this behalf this plaintiff and petitioner further avers and shows to said
court that attached to and made a part of this petition and accompanying this
petition is a map which correctly delineates the aforesaid tracts and parcels of
land sought to be condemned herein, and their locations; and this plaintiff and
petitioner now refers to said map so attached as aforesaid to this petition, and
incorporates said map, and makes it part of the descriptions of the aforesaid
tracts and parcels of land hereinabove referred to; and this plaintiff and
petitioner further shows that said map just referred to is marked herein as
"Exhibit A" [Figure 21].

This plaintiff and petitioner further alleges and shows that, of the aforesaid
tracts and parcels of land hereinabove in paragraph 2 of this petition
described, only that portion which is designated "Portion B" under the heading

"First," and described as being a portion of the Estate of Bernice Pauahi Bishop,
deceased, to wit, the whole of that certain Island shown upon the aforesaid
Hydrographic Office Chart No. 1800, and known and designated as Kualua,
includes the whole of an entire tract or parcel; and in this behalf, this petitioner
further shows that of the aforesaid tracts and parcels of land hereinabove in
paragraph 2 of this petition described, that portion which is designated
"Portion A" under the heading "First" and described as being a portion of the
Estate of Bernice Pauahi Bishop, deceased, and comprising about six hundred
and thirty-five (635) acres, more or less, and also that portion which is
described, under the heading "Second," as being a portion of the estate of the
John li Estate, Limited, a corporation and comprising about 151.6 acres, more
or less, include only parts of entire tracts or parcels.

Figure 21. Sketch Plan of Pearl Lochs Lands (The Pacific Commercial Advertiser,
1901b:2)
4. Under and pursuant to the power, right and capacity in it vested by law, it is
the intention, will, purpose and desire of your petitioner to acquire a fee
simple estate in and to the aforesaid tract and parcels of land, and their said
appurtenances, for all the purposes in this petition mentioned; and in this
behalf your petitioner demands and prays the acquisition of a fee simple
estate, for all the purposes in this petition mentioned, in and to the aforesaid
tracts and parcels of land, and their said appurtenances, sought herein to be
purchased, acquired, condemned and held by your petitioner for the purposes
in this petition mentioned.

5. That the purposes for which your petitioner has been and is now desirous
of purchasing, acquiring, condemning and holding the aforesaid tracts and
parcels of land, and their said appurtenances, constitute and are a public use
that the use to which the aforesaid tracts and parcels of land, and their said
appurtenances, are herein sought to be purchased, acquired, condemned, and
held by your petitioner, and to which said tracts and parcels of land, and their
said appurtenances, are to be put, is the following public use, to wit: The
erection and maintenance thereon of a naval station and harbor and channel
defense, for the uses and purposes of the Government of the United States of
America and of the Navy Department of said Government and for the
improvement of the harbor and channel leading thereto, hereinabove
referred to as Pearl Lochs, sometimes called Pearl Harbor, by removing
obstructions therefrom, and widening, deepening and straightening said
channel, together with the erection and maintenance upon said tracts and
parcels of land, and their said appurtenances of all such public buildings,
installations, magazines, arsenals, navy yards, light houses, range and beacon
lights, quarantine stations, pest houses, hospitals, wharves, docks, piers, dams,
bridges, cemeteries, reservoirs, roads, canals, ditches, flumes, aqueducts, pine
lines, and sewers as may be proper or necessary to or for the efficient
maintenance of said naval station and harbor and channel defense, and to and
for the uses and purposes therein of said Government and of its said Navy
Department; and that the foregoing public use is the public use for which the
aforesaid tracts and parcels of land, and their said appurtenances are required
by your petitioner, the United States of America.

6. Your petitioner further shows that the necessity for the acquisition,
purchase, acquisition, condemnation and holding in and by a fee simple
estate of, the aforesaid tracts and parcels of land, and their said appurtenances,
by your petitioner, for the aforesaid public use is and arises from that certain
Act of the Congress of the United States of America approved March 3d, 1901,
and adopted at the session of the Fifty-sixth Congress in the year 1901, and
entitled "Chapter 852—An Act making appropriations for the naval service
for the fiscal year ending June 30th, 1902, and for other purposes," said
Act being printed and published by the Government of the United States in that
certain official volume entitled "Statutes of the United States of America
passed at the second session of the Fifty-sixth Congress, 1900-1901, and
recent conventions, treaties, executive proclamations and concurrent
resolutions of the two Houses of Congress. Edited, printed and published by
authority of Congress under the direction of the Secretary of State, at Washington: Government Printing Office, 1901," and found between pages
1107 and 1133 of said official volume; and also from the present rapid
development of the commerce of the Pacific Ocean and the singular location
of said Pearl Lochs, sometimes called Pearl Harbor, with reference to said
commerce, relative to its value as a place of refuge, repair, instructions to
masters, protection to shipping, refuge for merchant vessels in time of war,
land-locked, deep-water anchorage, capacity for successful defense from
outside attack and capabilities as the only defensible harbor within the said
District of Hawaii; and also from the imperative need in a naval station of dry
docks, work and repair shops, coaling station of large capacity with sheds, coal
pockets, chutes and sheltered anchorages and berthing space for tugboats, lighters,
barge, coal hulks, etc. extensive grounds for marine barracks, parade
grounds, and a still larger area for drilling large bodies of sailors and marines,
ample camping grounds for any naval force that would be rendezvoused in
time of war, hospital accommodations with surrounding grounds, cemetery
facilities, ample and suitable space for magazine purposes, and such other
purposes and needs as are or may be proper or incidental to the maintenance
of such naval station—all of which must be capable of expansion as the future
nautical needs of the Government of the United States of America may demand;
and also from the judgment and decision of the Honorable, the Secretary of
the Navy of the United States of America, deciding that the aforesaid tracts
and parcels of land, and their said appurtenances, were the most fit, proper,
adequate and suitable tracts and parcels of land whereon to establish and
maintain the aforesaid naval station and its appurtenances; and in this behalf
this petitioner alleges and shows that the taking by the United States of
America of the aforesaid tracts and parcels of land, with their said
appurtenances, is necessary to the aforesaid public use; and petitioner further
shows that the necessity of and for said taking for said public use, is
hereinabove fully set forth and alleged.

7. Your petitioner further alleges said shows that through that portion of said
tracts and parcels of land aforesaid, hereinabove described, which is
designated herein as "Portion A" under the heading "First" and described as
being a portion of the Estate of Bernice Pauahi Bishop, deceased, and
comprising about six hundred and thirty-five (635) acres, more or less, is now
maintained and operated a certain railway, which said railway is owned,
maintained and operated by Oahu Railway & Land Co., a corporation; that it is
the intention, will, purpose and desire of your petitioner to acquire a fee
simple estate in and to the parcel of land used by said railway and upon which
said railway is now operated, together with the right of way therein of said
railway and all easements and appurtenances to said railway attached or
connected, for the purposes in this petition mentioned and your petitioner
demands and requires the acquisition of a fee simple easement therein; and
in this behalf your petitioner alleges and shows that the use of which said tract or parcel of land herein referred to as having been used for said railway, is sought to be put by your petitioner is a more necessary public use than any to which it has already (continued on page 3) been, or may have been, appropriated; and in this behalf your petitioner shows that the paramount necessity of the use to which said tract or parcel of land is sought to be put by your petitioner is hereinabove fully set forth and alleged.

8. Your petitioner further alleges and shows that the following persons are the owners of, or claim some interest in, the aforesaid tracts and parcels of land, hereinabove described, and their said appurtenances, sought to be condemned herein, to wit:

First—Of and in those two portions hereinabove referred to respectively as Portion A and Portion B of the Estate of Bernice Pauahi Bishop, deceased, sometimes called B.F. Bishop Estate, which are shown on that certain map known and designated as “Hawaiian Government Survey Registered Map No. 1739,” and which are hereinabove more particularly described:

Estate of Bernice Pauahi Bishop, deceased; and Joseph O. Carter, William F. Allen, William O. Smith, Samuel M. Damon and Alfred W. Carter, trustees under the will of Bernice Pauahi Bishop, deceased, and of the estate of said Bernice Pauahi Bishop, deceased; and Oahu Railway & Land Co., a corporation; and the Dowsett Company, Limited, a corporation; and Honolulu Sugar Company, a corporation; and Honolulu Plantation Company, a corporation; and Chow Ah Ho, in this behalf your petitioner aver, and shows that the Oahu Railway & Land Co., during all the times herein mentioned was, and still is a corporation, duly formed and organized under and pursuant to the laws of the Republic of Hawaii and now existing, acting and doing business in the aforesaid Island of Oahu under and pursuant to the laws of the Territory of Hawaii and having its principal place of business in said Island of Oahu; and in this behalf your petitioner avers and shows that the Dowsett Company, Limited, during all the times herein mentioned was, and still is, a corporation duly formed and organized under and pursuant to the laws of the Republic of Hawaii, and now existing, acting and doing business in the aforesaid Island of Oahu under and pursuant to the laws of the Territory of Hawaii and having its principal place of business in said Island of Oahu; and in this behalf your petitioner aver, and shows that the Honolulu Sugar Company, up to the 12th day of April, 1901, was a corporation duly formed and organized under and pursuant to the laws of the State of California and existing, acting and doing business in the aforesaid Island of Oahu and pursuant to the laws of the Territory of Hawaii, and that, on said 12th day of April, 1901, said Honolulu Sugar Company dissolved, and thereafter became merged into the Honolulu Plantation Company hereinabove and hereinafter referred to; and in this behalf your petitioner shows that the Honolulu Plantation Company was and is now a corporation duly formed and organized under and pursuant to the laws of the State of California, and now existing, acting and doing business within the aforesaid Island of Oahu under and pursuant to the laws of the Territory of Hawaii, and having its principal place of business in said Island of Oahu:

Second—Of and in that portion which is hereinabove described under the heading “Second,” as being a portion of the estate of the John Li Estate, Limited, a corporation, and comprising about 1516 acres, more or less, and which is hereinabove more particularly described:

John Li Estate, Limited, a corporation; and William G. Irwin; and Oahu Sugar Company, Limited, a corporation; and Bishop & Co., a co-partnership; and in this behalf your petitioner avers and shows that during all the times herein mentioned said John Li Estate, Limited, was, and still is, a corporation duly formed and organized under and pursuant to the laws of the Republic of Hawaii and now existing, acting and doing business in the aforesaid Island of Oahu, under and pursuant to the laws of the Territory of Hawaii, and having its principal place of business in said Island of Oahu; and in this behalf your petitioner avers and shows that during all the times herein mentioned said Oahu Sugar Company, Limited, was, and still is, a corporation duly formed and organized under and pursuant to the laws of the Republic of Hawaii and now existing, acting and doing business in the aforesaid Island of Oahu, under and pursuant to the laws of the Territory of Hawaii, and having its principal place of business in said Island of Oahu; and in this behalf your petitioner avers and shows that during all the times herein mentioned said Bishop & Co., was, and still is, a co-partnership duly formed, organized, existing, acting and doing business in the aforesaid Island of Oahu under and pursuant to the laws of said Territory of Hawaii, and having its principal place of business in said Island of Oahu, and that the following named persons were and are co-partners therein and compose said co-partnership, to wit: S. M. Damon, Henry E. Waity and S. Edward Damon.

9. That your petitioner has been and still is unable to agree with the several owners of and claimants to the aforesaid tracts and parcels of land, and their said appurtenances, sought to be condemned herein, which as aforesaid, are necessary for the aforesaid public purpose and public use, as to the compensation to be paid to said owners and claimants, for the reason that, although your petitioner has repeatedly requested said owners and claimants to name the price at which they would be willing to sell to the aforesaid tracts and parcels of land, and their said appurtenances, yet said owners and claimants persistently and continuously failed, neglected and refused to name such price, and your petitioner has been unable to obtain from said owners and claimants any such price, and said owners and claimants have each of them refused and still refuse to grant unto this petitioner the use of said tracts and parcels of land or their said appurtenances, and your petitioner has been and is now wholly unable to obtain from said owners and claimants, or any of
5.4.7 Sugar Companies and Landowners Compromise with the Navy (1901)

Sugar companies and landowners begin to compromise with the Navy over condemnation of land for military purposes. Lands within Waialua, Kualoa, and Hālawa are among those covered by the agreement.

*Evening Bulletin*

Land Compromises Completed Today - Pearl Harbor Cases Are Dismissed By Judge Estee. Three Heavy Claims Amicably Settled Oahu Sugar Company Keeps Its Ford's Island Fields.
States Naval Station, Honolulu, under date of September 16, 1901:

“Enclosed herewith find map and notes of survey of a piece of land along the southeast border of Ford Island, in Pearl Lochs, being the strip lying between the red border and the sea on the southeast side of said island and as indicated on the map also herewith enclosed.

“The leasehold of the land which the Government is seeking to condemn is worth at the very lowest, and most conservative estimate to the Oahu Sugar Company the sum of $200,000.

“Rather than have the land which the Government is seeking to condemn taken over, the company would be willing to convey to the Government, with charge, in so far as its interest in said land is concerned, the strip described in the enclosed notes of survey, being all the water frontage on the southeast side of said island, the Government will discontinue its proceedings to condemn the leasehold of the cale lands lying between the red and green lines on the enclosed map, the Oahu Sugar Company will convey to the Government, so far as its leasehold interest goes, the strip of land described in said notes of survey, for a consideration of one dollar or any other nominal consideration which you wish inserted in the deed.”

The foregoing proposition met with approval as shown in the following communication, procedure for discontinuance being authorized by telegram from Attorney General Knox to Federal Attorney Dunne:


“Sir—1. Referring to your letter, No. 181, of the 17th ultimo, in regard to the proposition, copy of which was enclosed therewith, made by the Oahu Sugar Company in regard to lands on Ford’s Island as proposed naval station.

“2. The bureau regards the proposition made by Messrs. Hatch & Stillman, attorneys for the Oahu Sugar Company, as most favorable, practically giving the bureau the absolute control of the north side of the channel between Ford’s Island and the Navy Yard proper. The bureau therefore telegraphed you yesterday through the Navy Pay Office, San Francisco as follows:

“Referring Bureau’s telegram, September 7th, suspending condemnation Ford’s Island land, bureau much prefers accepting Hatch & Stillman’s proposition, which your letter, No. 181, September 7th and authorizes acceptance.” Very respectfully,

“R. B. BRADFORD
Chief of Bureau.

Commandant, United States Naval Station, Hawaii, Honolulu, H.I.”

The Oahu Sugar Company claimed $200,000 damages, but in abandoning its claim it is left practically all of its sugar land on Ford’s Island.

No reason is given by Mr. Dunne in his affidavit for asking discontinuances of proceedings against the John li Estate. This is because the discontinuance there only relates to the landlord’s interest in the strip of land given up by the Oahu Sugar Company. The li interest is fee simple, the estate owning the entire island, has yet to be determined.

The Honolulu Republican
Plantation will Profit – Naval Works to Prove Benefit.
Judge and Jury Plan Visit to Pearl Harbor on Monday Next – Captain Merry and Manager Low Will Point Out Lands in Question – A “Full” Lunch to be Provided – Captain Pond on witness Stand – Testified Benefits to Property.

December 28, 1901 (page 6)

The case of the United States against the Honolulu Plantation Company for condemnation of land desired for Naval reservation purposes at Pearl Harbor, was resumed before Judge Estee in the United States District Court yesterday morning, continuing until about 3 o’clock in the afternoon, when court was adjourned until 10 o’clock Tuesday morning.

Just prior to adjournment Judge Estee instructed the jury concerning its proposed visit to the lands in question on Monday, reminding the members that they could not discuss values of lands and such things with anyone except themselves and they, in seeking information, were to confine their interrogations to matters pertaining to boundaries and where the lands were situated.

On Monday morning the jury, accompanied by Judge Estee, the counsel in the case, Acting District Attorney J.J. Dunne and F.M. Hatch and Judge Stillman, Chief Clerk Maling, Marshal Hendry and the bailiff will take the train to Pearl City where they will be met by carriages, in which they will be taken over the lands of the Honolulu Plantation.

They Are Gentlemen.

When Judge Estee had finished instructing the jury as to their conduct during the investigation, Judge Stillman for the defendant corporation asked that, in view of the necessity of there being someone to point out the various boundaries of the lands in question, the Marshal be sworn to give this and no other information.
Do you know anything about the boundaries of the land in question?” asked the Judge of Marshal Hendry.

“No, your honor, I do not,” was the Marshal’s reply.

Captain Merry, commandant of the Naval station, was in court, sitting beside Mr. Dunne for consultation purposes.

“You are acquainted with the boundaries of the Pearl Harbor lands, I believe?” interrogated the Judge.

“I am your honor,” answered Captain Merry.

“And Manager Low Is. are you not, Mr. Low?”

“I am your honor” replied Mr. Low.

“I would ask your honor that Captain Merry and Mr. Low be sworn,” said Judge Silliman.

“Captain Merry and Manager Low are gentlemen,” said Judge Estee with a wave of the hand in the direction of the gentlemen referred to, “and Gentlemen, I instruct you to give the jury only such information as refers to boundaries and locations of the lands in question.”

Captain Merry and Manager Low, therefore, will accompany the jury and party to Pearl Harbor on Monday...

Benefits of Naval Station.

Captain Pond of the United States tug Iroquois was on the witness stand most of the day. He testified to what he knew in regard to the Pearl Harbor lands and was questioned in regard to the benefits which would result to the plantation and to neighboring land generally by the construction of a dry-dock and repair shops and other things included in the contemplated Naval reservation at Pearl Harbor.

“What benefits, if any, will result to surrounding lands and residents?” asked Mr. Dunne.

“The construction of a dry-dock and the other improvements contemplated will greatly increase the value of surrounding lands,” said Captain Pond. “Building lots in the neighborhood will advance in price and, as a great number of men will be employed on the reservation, the benefit will be general.”

“Is it not a fact that the widening and straightening and deepening of the channel leading into Pearl Harbor, so that ships will be able to go right alongside the wharves of the Honolulu Plantation Company, will greatly benefit the Honolulu Plantation Company, lowering their freight rates and reducing their expenses?” asked Mr. Dunne.

Judge Silliman objected to the question. He had already objected to the previous question. Judge Estee however allowed the question, Mr. Dunne noting exceptions.

Judge Estee announced that the case should be conducted with considerable liberality and reminded Judge Silliman that he had been allowed some leeway himself.

Would Benefit Shipping.

Captain Pond answered Mr. Dunne’s question, saying that the improvement of the channel would materially benefit the interests of the plantation and would benefit shipping too. He dwelt on the advantages of the plantation being able to dispatch vessels direct from its wharves in Pearl Harbor, loaded with sugar and how the plantation would save the freight of the sugar to Honolulu and the cost of handling it there two or three times.

5.4.8 Konohiki Fishery Rights Extinguished Under Territory and Military Condemnation

In an effort to protect its fishery rights along the ‘Ewa coastline, the Bishop Estate went to court to fight the pending loss of fisheries in the Pu‘u‘aua region as well as those rights in other locations. An article published in The Pacific Commercial Advertiser outlined the effort, though the rights in the waters of Pearl Harbor were extinguished. Portions of the Kalanui and Hālawa fisheries were described in reference to traditional named localities.

The Hawaiian Star

Litigation On A Large Scale.


May 6, 1902 (page 7)

The Bishop Estate’s many suits against the Territory make up the biggest pile of litigation placed on the Circuit Court calendars at one time for many months. If not the biggest lot of actions ever brought here by one firm, Hatch & Silliman represent the estate in these actions, which involve extensive and valuable fishing rights all over the Islands. There are rights claimed all around O‘ahu, and some include waters of Pearl Harbor.

The complaints are the same in each case, except that each summons contains the description of a different right. It is set forth that the plaintiffs’ claim a fishing rights to the property described, involving the right to set apart each
year one kind or species of fish which shall not be caught; in lieu thereof, after consultation with tenants to prohibit all fishing within "certain months" of the year, also the right to take one-third of all the fish that may be caught by anyone within the bounds of the fishing right. The Territory, it is alleged, claims a right adverse to that of the plaintiff, and the court is asked to declare the plaintiff's exclusive right.

There are a number of suits other than those of the Bishop Estate, already on the calendar for the present term of the circuit. These have been filed during the past few months and include the claims of the Campbell estate, the Kapiloli estate, S. M. Damon, the John li estate, Victoria Ward, L.L. McCandless, William G. Irwin, making nine suits besides the nineteen of the Bishop estate. In each one of these cases. Attorney General Dole appears for the Territory, and after the rights have been established, in cases where such rights are established, he is to bring suits, according to the Organic Act, to condemn such rights for the public use, putting an end altogether to the private fishing rights system in the waters of the ocean.

The following are the locations of the various rights just claimed by the Bishop Estate:

Kapahulu, Ewa: From a point on Pearl Lochs shore at high tide on the boundary of Kualoa and Waimalu, 396 feet east along Waimalu fishery, 1690 feet along the sea, 400 feet to the shore on the, southeast boundary of Kualoa, then 1778 feet to the initial point...

Halawa, Ewa: From a point on Pearl Lochs shore, at high water boundary of Halawa and Aina, 5000 feet to Kamaka o Halawa, eastern end of Ford's Island, 9500 feet to Pearl channel opposite Keana, 2340 feet along center of channel, 1650 feet to point south of extreme end of Waipio, 3906 feet to turn in channel below Halekahi, 1500 feet to south boundary of Kunana, 900 feet to seashore at said boundary, and along shore to starting point...

Waiau, Ewa: At shore boundary of Waiau and Waimano, east to five feet depth of water, along same shore to line of Waimalu, east and thence south and to starting point...

The dredging contract to open the entrance of Pearl Harbor was awarded to B.F. Dillingham's Hawaiian Dredging Company in 1901. In 1903, it was reported that "big ships" could now enter the lochs.
putting up buildings and wharves whenever Congress makes the necessary appropriations. The dredger was brought up yesterday, and by tonight there will be nothing left at Pearl Harbor to show that men and machinery have been busy for months, except the completed channel.

The government engineer in charge of the work, Mr. Laurence Thompson, will leave on the Alameda for San Francisco. He will have with him the complete plans, and surveys and soundings which will be turned over to Col. Huer at San Francisco, who is at the head of the department under which the work has been done here. Although the work on the bar is as good as accepted. Col. Huer, after examining the plans, will give to Clark and Henry, the original contractor, a certificate showing the work to be completed and accepted by the Government.

Therefore save for the necessary amount of government red tape the opening of Pearl Harbor, a thing to which Hawaiian people have looked forward for four years, is practically completed.

Months ago the work was first started on the bar, and after one firm had failed to complete the work in the time specified, another firm took the contract, and although being delayed by inclement weather, and suffering the loss of a dredger, they carried the work through to a successful ending.

Engineer Thompson Talks.
Mr. Thompson, the United States engineer in charge, returned to the city yesterday and spoke as follows in regard to the work performed:

“The cutting of the bar at Pearl Harbor was an unusually difficult piece of contract work, and to Cotton Brothers only is due the success for doing the dredging and I might add that one particular man, namely Mr. James Agassiz is almost entitled to the individual credit for bringing to a successful completion a difficult piece of engineering work.”

When the government first desired to open up Pearl Harbor and expressed the intention of making great improvements there trouble was encountered in getting land. The land desired was partly on the Waikiki side of Ford’s Island and the rest on the mainland at the Waikiki side of the lochs extending from out Pualoa to the Peninsula of Kualua, taking in Aea. There was trouble in getting all of this land as the owners of the property would not accept the price that the government offered. After negotiations had been entered into and condemnation proceedings begun the Bishop Estate accepted $32,000 for some 786 acres of their land which the government desired. Deeds were also made out by the Oahu Railway Co. the li estate, conveying all title to the United States. The Oahu Railway Co. gave its right of way in Pearl Harbor to the United States for a consideration of $1. reserving the right to run trains over the present roadway.

The Dowsett estate was paid $2,400 in a check of the United States Treasury for its leasehold interest in 46.88 acres at Pearl Harbor, and the John Li estate received $3,000 for its fee simple interest in twenty-five acres along the south side of Ford’s Island. The Oahu Sugar Co. owned a twenty-five year lease on this latter property, but in consideration of the fact that the government would not disturb the remaining portions of the island, they surrendered their lease to the twenty-five acres for $1.

The Honolulu Plantation Co. controlled the leases on some of the Bishop Estate land which the government desired, but refused to give them up. The government accordingly brought suit to obtain the leases. On the first trial the plantation was allowed $103,000. The government asked for a new trial and Judge Estee granted it when the Honolulu Plantation refused to accept $75,000. The next jury allowed the plantation $103,000 and then the case was brought before the Court of Appeals. Before a decision was given however the plantation company accepted the amount which the government first offered. This was settled but a short time ago and meanwhile the work of opening the bar was well under way.

Mr. Thompson, the government engineer, first located and made a survey of the bar at the entrance to the harbor, and in following out the work there was no change made from the original findings. Bids for doing the work were then called for and it was found that Clark and Henry, contractors, of Stockton, Cal. had put in the lowest bid of $96,000, which was $400 less than the government had allowed for the work. According to the conditions of the contract the channel was to be dredged 200 feet wide, thirty feet deep, at mean tide and 1900 feet long. It was found necessary afterwards to extend the length of the channel 100 feet.

The contract allowed nine months for the work to be done, beginning with the first of April 1902. Clark and Henry started work, using suction dredgers at first but later changing them for dredges using clam shell scoops. After working for five months and finding that but sixteen per cent the work had been done the contractors came to the conclusion that they could not finish the work in the time specified, and furthermore that their machinery was not suitable for the work at hand.

The firm then sublet their contract to Cotton Brothers, and the latter paid them for work done and took over what machinery they thought they could use. However Clark and Henry undoubtedly lost money on the enterprise. Cotton Brothers undertook the work on the provision that they could secure an extension of time in which to finish the work. The original contract expired on Dec. 31, 1902, but the government extended the time nine months so that Cotton Brothers had until September to finish the work.

After matters were settled Cotton Bros. together with the help of the dredgers
controlled by the Hawaiian Dredging Co. started in to cut the channel, the work which Clark and Henry did amounting to very little.

It was found that the clam shell could not be used to advantage and recourse was had to the suction dredgers which were used exclusively afterwards. The work was oftentimes delayed by rough weather, and during a storm last October one of the dredgers sank.

Work was continued with the remaining dredger however and last Sunday night the men in charge stopped work knowing that the channel was finished and the contract fulfilled a full month ahead of the stipulated time. Soundings have been made at various times and there has been no sign so far of the sand seeping or caving in from the sides and filling up the channel.

Any vessel which has ever entered Honolulu should be able to enter Pearl Harbor at the present time. The minimum depth over the bar is thirty feet at low tide, and the maximum depth will average about thirty-two feet as the rise and fall of the tide is not very large in this locality. Mr. Thompson said yesterday that vessels drawing nearly thirty feet and not over 400 feet in length should be able to enter the inner harbor without difficulty.

The bar opened up the government will no doubt take steps in the near future to improve its holdings around the harbor, and a few years will no doubt see a wonderful change in the former surroundings of that hitherto quiet district.

5.4.9 Dredging Details for Pearl Harbor

The Pacific Commercial Advertiser
Reefs and Shallows Of Pearl Harbor Channels
Many Points That May Be Dredged or Blasted Away Before Navigation Commences—Sharp Corners the Form Natural Protection

September 5, 1903 (page 1)

The channel leading into the Pearl Harbor lochs and recently dredged by the United States government has still many reefs and other obstructions to free navigation. One of these reefs is considered a natural protection rather than menace but it is generally accepted that others will be cleared away. In the lochs themselves are many projecting spits and unexpected reefs in the middle of natural channels that will probably be removed as soon as the lochs are opened up for general navigation.

The Principal Obstacles.
The accompanying map shows the principal obstacles. In the main channel on the right hand or starboard side in entering, all that now remain of the many piles driven by the dredging company and of those that were in place before they started operations, are two dolphins, formed each of three baulks of heavy timber meeting at the apex. Other piles are removed but some are submerged close to the surface. Marking rods of three inch pipe were driven down. Some of these have been broken off by the vessels of the dredger and are a serious menace to entering boats. They lie on the starboard side of the channel on entering but no buoys have yet been placed to mark the entrance of the channel as with the bell and spar buoys in Honolulu harbor. The dolphins already mentioned are nearly half way up the channel and a yacht, tug or vessel not knowing the waters might easily attempt, coming from Honolulu to enter the channel inshore from the proposed entrance and strike the submerged piles. These dangers will be obviated later when the entrance marks are placed.

Figure 23. Pearl Harbor Reefs and Channels (The Pacific Commercial Advertiser, 1903b:1)
Wrecked Dredger A Menace.
The sunken dredger, which is marked by a buoy, which is however generally well to leeward of the wreck, is on the edge of the right channel and directly in the road of the old bearings of the Puluola tower and the line where the Waianae range strikes the plain. These bearings are marked on the chart and will be generally used until the channel is finally buoyed. In ordinary weather the hull shows a brown patch on the water as it lies a scant fathom beneath the surface, but with the surf running; free, it is indistinguishable and the buoy is small. Many moorings left by the dredgers are swinging loose in the channel. These are too small to hurt any but a small boat.

Following the channel in to the cross on the chart marked "small stake" an incoming vessel under steam or in tow is compelled to turn a sharp corner and skirt ing a hard coral reef three feet below the water, with some portion above at low tide. It is thought that this corner will be taken out.

A Natural Protection.
The second corner also marked "small stake" and still more abrupt, is the one considered a natural protection as incoming vessels are forced to proceed slowly, and in the case of an enemy, they could be shelled to pieces by land batteries.

The next stake is on the port or left hand side of the channel and marks the extremity of the "shark pen" built in bygone days as a trap for unwary sharks who found themselves caught within its walls by an ebbing tide. This work and its reef foundation will probably be removed.

Next comes the spit on which the railroad wharf is built and which necessitates a sharp turn to the left. The spit can be easily dredged without blasting.

On the right hand side at the point marked 1-2 (fathom) there is a dangerous coral spit causing a turn to the left before entering the channel to the Middle and East lochs. This was staked by the Hawaiian Yacht Club but Japanese sampans have either run down or carried away the stake by mooring.

West Loch Is Navigable.
The West Loch is singularly clear from projecting spits, the water running deeply to the coral banks on either side, where it averages, for some two miles, nine feet for the edge shallows.

The water in the center channel off the shark pen and in that neighborhood, runs to an extreme depth of 138 feet.

Proceeding toward Ford's Island, a rocky point, partly formed from the ruins of an old fish pond, projects off Waipio point, marked 1-2 (fathom) "stake H. Y. C." This stake has sunk or broken off close to the surface. This with the point last mentioned will, it is thought, be included in the straightening out plan.

Ford's Island Dangerous.
Rounding Ford's Island on the seaward side, the course taken by the Iroquois in her late cruise, that vessel mooring for luncheon at a point off the flag on the island marked U. S. N. on the chart, a shoal runs out to the center of the natural channel, the deep water being under the lee of the island. This shoal marked 1 (fathom) is charted but not otherwise signalized.

The eastward end of Ford's Island runs out in a shoal of large area from which rise the rocky inlets of Moku-nui and Moku-iki. Two stakes are set here by the Hawaiian Yacht Club but by these there is a bare two fathoms and the larger boats often get a foot or two too close and stir the mud.

The East and Middle lochs contain much deep water but naturally shoal as they approach their ends where streams are constantly depositing alluvial banks.

Off the Peninsula, particularly at its tip and on the leeward or western point, the bottom is but a foot or so below the surface. Where the water deepens, between the spot marked 1 (fathom) and the shoal, runs a channel of three to four fathoms. The spot as marked rises abruptly and while charted as one fathom is covered by less than five feet of water. The deeper pleasure craft often pile up here and the yacht club has taken bearings and will stake the spot. They have already staked the extremity of the neighboring shoal.

Middle And East Lochs Shallow.
The Middle Loch contains but little navigable water for vessels of any draft. The East Loch shoals rapidly towards the northern end, near Waiau but is deeper on the Eastern side. The natural channel on the western side of Ford's Island, between it and the Waipio Peninsula and across which the ferry between the Oahu plantation sugar wharves plies by cable, is navigable for deep draught vessels.

Four Miles Of Inland Seas.
The lochs extend inland some four miles from the mouth of the harbor whence it is one and a half miles to the bar of the newly dredged thirty-foot channel.

The Peninsula is settled with the summer homes of Honolulu folk and is the favorite resort of the yachting fraternity. Their principal club house is situated on the leeward side with a smaller erection at Puluoa near the shark pen. The naval property takes in a portion of Ford's Island and the opposite shore as marked by the flags on the chart.

In 1904, it was reported that an agreement between the Dowsett Estate and the United States had been reached which transferred several hundred acres of the Ili of Puluoa in Honolulu Ahupua'a to the U.S. The property was just one of several parcels being planned for
fortification of Pearl Harbor.

*The Hawaiian Gazette*

**Puuloa Fort Site Now Belongs to Government**

December 23, 1904 (page 7)

United States District Attorney Breckons paid out nearly $80,000 yesterday to the owners of Puuloa, Pearl Harbor property. Titles passed from the Dowssett Estate which received over $65,000, and the remainder was distributed among Waterhouse, Lovekin, and three others.

By June next the United States will have spent about $300,000 in acquiring property on which to build its fortifications at Pearl Harbor, Kaimuki and Waikiki Beach. The Kaimuki property has already been acquired.

Title to the Hobron property at Waikiki Beach will probably pass this week. The Schaefer title has not passed. No option, as far as Mr. Breckons is aware, has been obtained on the Aifong property.

While individual owners profit by the wholesale purchases of the War Department, the Territorial treasury suffers to some extent. Taking the whole property at an assessed value of $250,000, the territory loses in taxes about $2,500 per year.

On the other hand it is said that the property surrounding the War Departments reservations will increase in value, thereby reducing a possible loss to the Territorial treasury.

*The Pacific Commercial Advertiser*

**The Petrel at Pearl Harbor**

January 12, 1905 (page 2)

At noon yesterday the trim little gunboat Petrel of Uncle Sam’s navy rode at anchor on the waters of Pearl harbor, the future great American naval base. The anchoring of the Petrel in Pearl Harbor marks a milestone in the development of the lochs, for it was the first time a vessel of so large a type had been there.

Although the Petrel is one of the smallest gunboats in the American navy, yet she carries an armament of pretty heavy guns and is able to make a good showing in the face of an enemy. True, the station ship Iroquois has frequently steamed about the lochs, but the Iroquois is only a naval tug, converted from a tow-boat which saw constant service in San Francisco bay.

The Petrel commanded by Commander Sherman, with Lieut. Commander

Nihlack, Captain of the yard at the Honolulu Naval Station, aboard, left Honolulu yesterday forenoon. Under the pilotage of Captain Nihlack the gunboat was safely taken up to the location approximately marked X on the accompanying map, or about half way between Dr. McGrew’s place and the Aiea Railroad station.

The Petrel will remain in Pearl Harbor for some time, the intention being to give the men all manner of drill comprising boat drills under arms and general maneuvers.

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**Figure 24. The Gunboat Petrel Arrives at Pearl Harbor (The Pacific Commercial Advertiser, 1905:2)**

As is typically the case for government jobs, bids for construction of the Pearl Harbor fortifications at the Hālawa and Pu‘u‘ōla entrances of Pearl Harbor were elicited. The bids made the news when a bid for construction was found to be from a local a Japanese firm. A 1908 article reports—

*The Hawaiian Gazette*

**A Japanese Hui Among The Bidders**

January 14, 1908 (page 2)

The Japanese of this city wish to have a hand in the construction of the fortifications here. This was developed yesterday through the opening of the bids for sand and stone to be used in fortification work at Pearl Harbor. The lowest of the bids was that of James Hogan, a newcomer in the city, who figured $3600 under the lower bid of the local contractors who tried for the
job.

The bids were as follows:

<table>
<thead>
<tr>
<th></th>
<th>Rock per ton.</th>
<th>Sand per ton.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>James Hogan</td>
<td>$2.03</td>
<td>$2.70</td>
<td>$58,850</td>
</tr>
<tr>
<td>H.E. Hendricks</td>
<td>2.10</td>
<td>2.95</td>
<td>62,250</td>
</tr>
<tr>
<td>Wilson and Chapin</td>
<td>2.13</td>
<td>3.25</td>
<td>65,460</td>
</tr>
<tr>
<td>Fred Harrison</td>
<td>2.61</td>
<td>3.47</td>
<td>75,600</td>
</tr>
</tbody>
</table>

The authorities believe that Hogan's bid is that of a dummy put up by a hui of which George Yamada is the head and the Yokohama Specie bank, a Japanese national institution, the backer.

When asked for a statement in regard to the contract last night, Hogan refused to make any answer, to tell who he was, or where he had come from. It is learned, however, that he claims to have done large jobs in Bombay and Hongkong, and to have been employed in the work done by the United States Engineer Corps in Manila. In connection with the Manila work he does not state what position he held.

Under the Federal laws there is nothing whatever to prevent all the work on such a contract being done by Japanese, as there is no provision, such as there is by Territorial statute, which calls for the employment of citizen labor. From this it may be seen that should the contract be given to the Japanese hui, in which Hogan is believed to figure, a foreign power would know as much about the Pearl Harbor forts as our own government.

The work which is to be done is at Halawa, where there will probably be forts of importance, which will act as the protection of Pearl Harbor when it shall be used as a naval base. Then landing which will be used is in land of Puuolu.

Hogan came here only a few months ago and has never had charge of any large jobs. His qualifications and financial responsibilities could not be learned last night. He stated at the time that he had heard that all the bids for the contract had been rejected, though it was learned later from Captain Otwell that no such action had been taken up to the present time. In regard to his reasons for not talking about himself, Hogan stated that he thought it would be detrimental to his interest to do so at the present time.

While Captain Otwell refused to make any statement on the subject, it is doubtful if a bid from the Japanese syndicate would be accepted by the government. Whether the next lowest bid will be accepted or the material needed will be obtained by purchases in the open market, and the work done by day labor is unknown.

5.4.10 Congress Passes the "Bates' Pearl Harbor Bill," $10,000,000.00 Allocated. Dredging, Drydock and Construction Authorized (1908)

Countless communications, proposals, surveys, and plans were recorded as a part of the effort to develop Pearl Harbor as a naval station and military presence in the Pacific. In 1907, a map of Pearl Harbor (Figure 25) identified areas of operation as Congress was debating funding and development strategies. Subsequently, the "Bates Pearl Harbor Bill" of 1908, provided funding for full scale development.

The Hawaiian Gazette
Bates' Pearl Harbor Bill To Become A Law
The Measure Passes Through Congress and Now Awaits the Signature of the President—Involves a Great Outlay.

May 15, 1908 (page 2)

Washington, April 20.—The white man’s outpost in the Pacific! The greatest naval station in the world. It is now settled that this is what Uncle Sam will establish at Pearl Harbor, on Oahu Island, seven miles from Honolulu.

He will spend from ten to twelve million dollars to do it. Once it is accomplished the Pacific fleet sheltered there will protect not only Hawaii, but will become the watchdog of the Pacific Coast, always alert, ever ready for attack.

A bill has been passed by the House, and will be passed without opposition by the Senate, providing for the expenditure immediately of $630,000 in the preliminary work, and, before the next session of Congress, an additional amount of approximately $2,500,000.

There are no official figures upon the probable ultimate cost of the improvement, but the Taft Board recommended fortifications to cost $3,500,000, and there is planned a drydock to cost $2,000,000 more. This with the estimated cost of dredging the channel and removing the bar at the harbor mouth, $2,000,000, the equipment of machine shops at a cost of $1,000,000, and the coal shed, store house and naval yard construction to cost another million, brings the amount approximately to $10,000,000.

In preparing for this highly important auxiliary to the Pacific fleet, Congress and the House Naval Committee is going it alone, for the Naval Board has never made any estimates or recommended the general project, despite the fact that the land surrounding the harbor, some 600 acres, was purchased by the United States for this purpose before the acquisition of the Islands, for $650,000. Nothing has ever been done toward improving it to date.

The importance of Pearl Harbor as a naval strategic point has been urged upon
5.4.11 The Virtues of Pearl Harbor Extolled in the Local Papers

The following articles are representative of many that highlighted the important of Pearl

in Manila Bay, when Uncle Sam purchased the harbor and its surrounding territory from the Hawaiian government.

The harbor is formed by the mouth of the Pearl river on the southern shore of Oahu Island, seven miles from Honolulu. With the exception of the bay at Honolulu it is the only harbor for large vessels in all the Islands.

Topographically, Pearl Harbor is an ideal naval station site. It is a beautiful lagoon, three miles long, which branches out at the inner end into a delta-like harbor with a land frontage of 30 miles. The water varies from 30 to 60 feet in depth. Coral and sandstone banks rise so straight that a full-rigged man-of-war could anchor alongside without docks. The rise and fall of the tides in the harbor is scarcely noticeable.

A sand bar now obstructs the mouth of the river, and the plan contemplates removal and the dredging of a wide, deep channel out to sea. For a mile beyond the sand bar the approach to the harbor shows only a depth of 100 feet, a condition especially well-suited to marine operations. The experience of Honolulu, in dredging away a similar bar, was that after removal it did not reform.

It would be utterly impossible for a hostile fleet to force an entrance to the harbor, once it was properly fortified. Two immense cliffs jut upward at the mouth of the river, and heavy guns placed here could not repel any attack from the sea, but also defend Honolulu, whose sea approach lies within easy range. Back of Honolulu are cliffs that would afford excellent location for coast defenses, which, coupled with the Pearl Harbor fortifications, would make that city of 50,000 practically immune from a sea attack.

Supplies could be brought to Pearl Harbor over the Oahu Land and Railroad Company’s line, which skirts the harbor. Fresh-water springs and artesian wells on all sides insure an excellent water supply. Surrounding it, inland, is a fine agricultural country, which could be drawn upon for the ordinary food supplies.

Congressional advocates of greater naval extensions are enthusiastic over the project. "Within my lifetime," says Representative Richmond P. Hobson, "I expect to see Pearl Harbor become the greatest naval station in the world. I make this statement because it presents the one combination of physical conditions that makes possible a great naval station as the focus of radius of 2,500 miles to the Pacific Coast. It makes it thus, not only the outpost for America, but the outpost for the white man."
Harbor for the protection of the United States, and also includes a synopsis of the history of how the U.S. came to control the islands.

Evening Bulletin (Section II – Atlantic Fleet Edition)
Honolulu and Pearl Harbor Vital Centers of America's Power in Pacific Ocean – Hawaii Commands the Whole Pacific

July 16, 1908 (pages 1 & 2)

Look at Hawaii on the Map

“Midway between Unalaska and the Society Islands, midway between Sitka and Samoa, midway between Port Townsend and the Fiji Islands, midway between San Francisco and the Carolines, midway between the Panama Canal and Hong Kong, and on the direct route from South America ports to Japan, the central location of these islands makes their commercial importance evident.

But vastly greater is their strategic value to the United States.

Captain Mahan says "Too much stress cannot be laid upon the immense disadvantage to us of any maritime enemy having a coaling station well within 2500 miles of every point of our coast line from Puget Sound to Mexico. Were there many others available, we might find it difficult to exclude from all. There is, however, the once. Shut out from the Sandwich Islands as a coal base, an enemy is thrown back for supplies of fuel to distances of 3500 of 4000 miles—or between 7000 and 8000 going and coming—an impediment to sustained marine operations well-nigh prohibitive. It is rarely that so important a factor in the attack or defense of a coast line—a of a sea-frontier—is concentrated in a single position, and the circumstance renders it doubly imperative upon us to secure it if we righteously can."

“This was written in 1893, and the final annexation of Hawaii shows that the lesson and warning conveyed in the above were minded at the right moment.

“With the Sandwich Islands we have acquired Pearl Harbor, of which Admiral Walker said: ‘It should not be forgotten the Pearl Harbor offers, strategically and otherwise, the finest site for a naval and coaling station to be found in the whole Pacific.’

Pearl Harbor progress
1884—Treaty negotiated by President Grover Cleveland and King Kalakaua, giving the United States exclusive rights to Pearl Harbor.
1896—Annexation of Hawaii to the United States.
1908—Appropriation of $3,000,000 by Congress to straighten channel and establish Naval Station at Pearl Harbor.

Pearl Harbor Station Protection for America
(By Hon. Jonah Kalanianaole, Delegate to Congress.)

I simply cite some historical facts to show how conclusively and for how long a time the strategic value of Pearl Harbor and the Hawaiian Islands has been officially recognized by the Government of the United States.

Beginning in 1842, President Tyler gave notice to European nations that the United States would never consent to their occupying the Hawaiian Islands.

In 1851, when the French were threatening to occupy Hawaii, Daniel Webster, then Secretary of State, wrote: "I hope the French will not take possession of Hawaii; but if they do, they will be dislodged, if my advice is taken, if the whole power of the Government is required to do it."

William L. Marcy, when Secretary of State, reiterated the declaration that Hawaii would not be permitted to fall into the hands of any European nation. Up to that time there was no menace of Hawaiian occupation by any nation other than European.

Almost a third of a century ago, when King Kalakaua was the reigning monarch of the Hawaiian Kingdom, the United States, by reciprocity treaty, obtained rights over the waters of Pearl Harbor. This was the first step toward carrying out the policy announced by President Tyler thirty-five years previously.

Coming down to the days of Blaine and McKinley, we find those statesmen repeating the declarations of their predecessors.

By the time that President McKinley reached the White House, it had become apparent that the danger of the occupation of Hawaii by a foreign power had been shifted from European nations to those of the Orient.

Finally, ten years ago, when the unexpected events of the Spanish-American war thrust a new situation upon this nation, it became apparent that it was necessary for the United States to acquire the sovereignty of the Hawaiian Islands, both for the protection of the Pacific coast and in order to make it possible to maintain any naval base in the Far East.

But although this Government annexed the Hawaiian Islands for the particular value of their strategic location, they permitted almost ten years to pass without turning a sod or laying one foundation stone toward the actual construction of a naval station at Pearl Harbor.

A magnificent site of over 600 acres of ground has been acquired for this purpose.

The 10 square miles of landlocked waters in Pearl Harbor could easily
accommodate the combined fleets of this nation and of Great Britain, but that
can never give shelter to a battle ship till docks are built and the channel
approach is straightened.

The importance of Pearl Harbor as a naval and military base has been
repeatedly urged by men able and experienced in military and naval science;
among them Captain (now Admiral A. T. Mahan, who pointed out with
unanswerable arguments the commanding importance of Pearl Harbor as the
key to the Pacific.

This Government for ten years neglected the safeguard of preparing a naval
base in the mid-Pacific. Our relations with other nations are such to-day that
it would be inexcusable neglect of the responsibility of Congress to the nation
to postpone this work another year.

The development of Pearl Harbor is not a Hawaiian proposition; it is a national
need. But as my nation gave over its sovereignty to this country ten years ago,
we have a right to ask, and we do ask that adequate protection be provided for
our islands, so that we could not be captured by a single hostile battle ship as
could be done to-day.

Coast fortifications alone are not sufficient; there must be an operating base
for war vessels as well as coast defenses, and the latter are useless without the
former.

Hawaii should be defended for its own protection; but I repeat that it is far
more important for the offensive and defensive plans of the nation as a whole...

First Pearl Harbor Treaty
Grover Cleveland, President of the United States, and David Kalakaua, King of
Hawaii, concluded the treaty which first placed Pearl Harbor within the
control of the United States.

The proclamation setting forth the terms of the treaty is now in the archives
of Hawaii and reads as follows:

Whereas, a Convention between the United States of America and the Kingdom
of the Hawaiian Islands, for the purpose of definitely limiting the duration of
the Convention concerning Commercial Reciprocity concluded between the
same High Contracting Parties on the thirtieth day of January, 1875, was
concluded and signed by their respective plenipotentiaries at the city of
Washington, on the sixth day of December, in the year of our Lord, 1884, which
Convention, as amended by the Senate of the United States and being in the
English language, is word for word as follows:

Supplementary Convention to limit the duration of the Convention respecting
Commercial reciprocity between the United States of America and the
Hawaiian Kingdom, concluded January 30, 1875.

Whereas, a Convention was concluded between the United States of America,
and His Majesty the King of the Hawaiian Islands, on the thirtieth day of
January, 1875, concerning commercial reciprocity, which by the fifty-second
article thereof, was to continue in force for seven years from the date after it
was to come into operation, and further, until the expiration of twelve months
after either of the High Contracting Parties should give notice to the other of
its wish to terminate the same: and

Whereas, the High Contracting Parties consider that the increase and
consolidation of their mutual commercial interests would be better promoted
by the definite limitation of the duration of the said convention.

Therefore, the president of the United States of America, and His [page 1]
Majesty the King of the Hawaiian Islands, have appointed:

The President of the United States, Frederick J. Frelinghuyzen, Secretary of
State; and

His Majesty the King of the Hawaiian Islands, Henry A.P. Carter accredited to
the Government of the United States as His majesty’s Envoy Extraordinary
and Minister Plenipotentiary;

Who, having exchanged their respective powers, which were found sufficient
and in due form, have agreed upon the following articles:

Article I.
The High Contracting parties agree, that the time fixed for the duration of the
said Convention, shall be definitely extended for a term of seven years from
the date of the exchange of ratifications hereof and further, until the
expiration of twelve months after either of the High Contracting Parties shall
give notice to the other of the wish to terminate the same, each of the High
Contracting Parties being at liberty to give such notice to the other at the end of
the said term of seven years or at any time thereafter.

Article II.
His Majesty the King of the Hawaiian Islands grants to the Government of the
United States the exclusive right to enter the harbor of Pearl River, in the Island
of Oahu, and to establish and maintain there a coaling and repair station for
the use of vessels of the United States, and to that end the United States may
improve the entrance to said harbor and do all other things needful to the
purpose aforesaid.
5.4.12 Development of Drydock No. 1 (1909)

Local papers reported almost daily on preparations for development of the naval station. On January 12, 1909, it was announced that Hawaiian Dredging Company received the contract to undertake Pearl Harbor’s dredging. On February 13, 1909, readers were told that bids for drydock construction at Pearl Harbor had been opened in Washington, but concerns about the bids led to a reopening of the bid process. On August 3, 1909, it was announced that dredging of the entrance channel to Pearl Harbor began. Additionally, work on Drydock No. 1, in the vicinity of Loko a-manó (an ancient pond site) situated across from Kūhāʻa Island on the shore of Hālawa, between Lāe Apana and Loko Pōhaku, was announced for startup by October 1909.

The Hawaiian Gazette
details of pearl harbor drydock show vastness of the structure.

January 12, 1909 (page 3)

Washington, December 29. The Bureau of Yards and Docks has "signed up" the contract for dredging the channel to Pearl Harbor and there is every expectation that the work will be under way within two or three weeks. For the Hawaiian Dredging Company, the papers were signed by President Denison Treasurer Dillingham. For the Government, Acting Secretary of the Navy Satterlee signed.

The company has two dredges in Honolulu harbor now, which can be set to work immediately. Some cabling has been done to secure other dredges that there may be just as little delay as possible in beginning the work on a large scale. The contract calls for the completion of the work in three years. The amount of material to be excavated is 5,017,000 cubic yards.

Drydock work first thing. The bids for the drydock at Pearl Harbor are to be opened February 13, by which time it is hoped to expedite the beginning of actual work on that important undertaking. When the contract for the drydock is awarded, the program of construction work for the improvement of Pearl Harbor will be completed, as far as the Bureau of Yards and Docks is concerned, for the present. In about a year or a year and a half, the Bureau will take up the building of machine shops, storehouses and a wharf. Those structures can wait for a while as it is more urgent to hasten operations on the drydock and the dredging. While those two projects will be in the hands of contractors, two projects of the Civil Engineer corps, C. W. Parks and O. S. Burrell, who are now at Pearl Harbor, will continue there to supervise and keep an eye over the progress of the work.

Full description of great dock. The Bureau recently prepared a memorandum of the big drydock, explaining in detail what it will be. This memorandum was as follows:

"1. The drydock at the naval station, Pearl Harbor, Hawaii, is to be the largest ever constructed by the Navy Department. Its overall length is 1,195 feet, whereas the longest dock previously constructed, which is at Philadelphia, is 709 feet overall, and the Puget Sound drydock recently contracted for, is 803 feet, overall.

"2. An innovation, so far as American docks are concerned, is that there will be four caisson seats, two as usual at the entrance to the drydock and two others near the middle of the dock, dividing the main structure into an inner and outer dock. There will be two steel caisson gates and the arrangements will be such that with a ship in the inner dock the outer dock may be filled and emptied independently, thus allowing the ship upon which the most repairs are to be made to remain in the inner dock while ships with minor repairs are being docked in rapid succession in the outer dock. By floating the inner caisson from the drydock, ships of greater length than any now in existence or planned could be docked.

"3. A trapezoidal form of head has been designed for this dock different from any other hitherto considered. It is arranged so that three destroyers may be docked side by side extending to the very head end of the dock, leaving room for three or four smaller craft in the inner dock. Bids will also be received for the usual forms of V-shaped and arched head.

"4. The draft over sill at mean high water will be thirty-five feet, which is more than any other dock excepting the one at Puget Sound where the great variation in tides required a draft of thirty-eight feet. The conditions of tide at Pearl Harbor are such that the largest battleship may enter the dock at any stage of the tide. Concrete will be used throughout in the walk and floor. Granite lining will be used only at the caisson seats and coping at entrance and material slides. The conditions for the use of concrete are to be more favorable at Pearl Harbor than at any point in the United States on account of the equable climate and absence of frost."
Level and Clear Floor. "5. A marked improvement over all previous docks has been developed in connection with the dock for Pearl Harbor, in that the working floor will be absolutely level from end to end, giving a level working surface free from the usual obstructions, such as bilge block slides, docking keel block bearers, bilge block chains, temporary electric wires, temporary compressed air lines, etc. The attempt has been made many times previously to accomplish this object, but never with success. It has been accomplished in this case by an entirely new design for bilge block bearers and docking keel block bearers. The bearers are made in the shape of cast iron boxes in the dock floor with top flush with the concrete. The wide flanges on the top form the bearers for the keel blocks and bilge blocks and a slot is provided through the top of the box to take the anchor bolts for keel blocks and the holding-down device for the bilge blocks. The cast iron box is large enough also to take the chains for the handling of bilge blocks across the floor of the dock while a ship is being placed. Another most important feature of the cast iron boxes is to drain the floor. The water passes through the slots and flows along the sloping bottom of the boxes and is discharged into four large longitudinal subfloor drains. These, in turn, carry the water into the drainage chambers near the middle of the dock. The inner dock and outer dock each have an independent system of longitudinal drains and a drainage chamber. Three 54-inch pipes with gate valves pass from each drainage chamber into a common wet chamber outside of the drydock structure. The four 54-inch suction pipes from the pump well, which is close by, open into the wet chamber, thus removing water which flows in from either one or both of the drydock. The slots, cast iron boxes and drains have been so designed that the velocity of water being pumped will be sufficient to remove any silt which may have collected.

"6. The system of cast iron boxes with slots and longitudinal floor drains will also be used for filling the dock. Pouring culverts, two on each side of the drydock, having inlets in the quay wall at the entrance of the dock, are connected with the longitudinal drains in the inner and outer docks in such a manner that either dock may be filled independently of the other. The water will be discharged into the dock body through the slots, having thus an upward velocity on entering and being uniformly distributed over the entire floor. This is much superior to having the water enter at the ends of sides with a velocity sufficient to cause harmful movements of the ship.

Sixteen Flights of Stairs. "7. Sixteen flights of stairs extend from the coping to the floor. This number is liberal in order that the workmen may enter and leave the drydock with expedition. An idea of the depth of the dock is gained from the fact that it will take sixty-five steps to go from the floor to the coping. The stairways have been so designed that the altars are not interrupted, but pass around the stairs with slightly reduced width. The design is similar to that previously used in drydock No. 2 at Philadelphia.

"8. There will be 539 keel blocks extending from the entrance to the head of the drydock. These are for the purpose of carrying the weight of the ship when the dock is pumped. Two lines of docking keel blocks will extend on either side of these to take the weight of turrets, etc., of battleships.

"9. The pump well will be located near the middle of the dock and about thirty feet away. It will be of octagonal shape and contain four 54-inch pumps. In addition to the four suction pipes which lead to the wet chamber of the dock to be built at the present time, short ends of pipe will be built into the masonry so that a second drydock may be pumped by means of the same pumps. The discharge from the pumps will be carried in a discharge culvert leading to the bay. The general dimensions of the drydock will be as follows:

Overall length, 110.5 feet; width between coping, 130 feet; width overall, 140 feet; depth at sill, at mean high water, 35 feet; depth over keel blocks, at mean high water, 32 feet 6 inches.

An Encircling Railroad. "10. A track for a 40-ton crane will be built around the drydock structure with the inner rail close to the edge of the coping. The total length of rail in this track will be within a few feet of one mile.

"11. The construction of the dock will necessitate the disposa of 35,000 cubic yards of material. This will be utilized in filling some of the low areas on the station property. The depth of the excavation will be 58.5 feet. This is more than the height of an ordinary four-story building. The total amount of concrete to be used in the dock is approximately 120,000 cubic yards."

The Pacific Commercial Advertiser
Dillinghams May Build Dock – Negotiations with Coast Firm to Secure Contract

July 18, 1909 (page 1)
Should negotiations now under way bear fruit, the Hawaiian Dredging company will take over from the San Francisco Bridge company the contract for building the big naval drydock at Pearl Harbor. The deal has not yet been consummated, but it is understood that an agreement may be reached early this week.

The local representative of the San Francisco Bridge company is the Hawaiian Dredging company. The latter concern holds the contract for the dredging of Pearl Harbor, and the work is well under way. With a large force of men already on the ground, and all of the facilities at hand for taking hold of the drydock job, it is believed that the local concern can handle the proposition on a more profitable basis than could a company with headquarters further from the base of operations.
A representative of the San Francisco Bridge company is now here looking over the ground, and it is understood that, through him, the negotiations are being carried on.

Walter Dillingham, manager of the Hawaiian Dredging company, when asked for a confirmation of the report last night, declined to make any statement other than that, under any circumstances, his company will probably exercise general supervision over the drydock work.

The drydock job is one of the most important items of the Pearl Harbor naval station project. Under the terms of the contract between the San Francisco Bridge company and the government, work must begin immediately.

**The Pacific Commercial Advertiser**

**Digging Test Holes.**

**August 24, 1909 (page 5)**

A small clam shell dredger is digging a hole at the entrance of the proposed drydock at Pearl Harbor to determine the character of the material which is to be excavated. A hole is also being dug at the after-end of the drydock. It is said that large quantities of water are being encountered. If this is the case, most of the excavation for the drydock may have to be done by sea dredgers.

**The Pacific Commercial Advertiser**

**Hollyday Comes for Inspection. Work on Pearl Harbor Drydock will Begin in about a Month.**

**August 31, 1909 (pages 1 & 6)**

Within thirty-two months the Pearl Harbor drydock and naval station must be completed and turned over to the Navy Department.

Within thirty days work will begin on the excavation of the basin for the drydock.

Within a year all work planned for the development of the Pearl Harbor naval station will be under way, including the construction of the Marine Corps barracks, naval station administration buildings, machine shops, storage houses, quarters for officers, hospital, railroads, and wharves, while much of the deepening of the harbor along the shore line, cutting off projecting reefs, and widening, deepening, and straightening of the channel will have been done...

F.B. Smith, representing the firm [San Francisco Bridge Company] which was awarded the contract for the construction of the drydock, also arrived on the Siberia, and was met by W.F. Dillingham, head of the Hawaiian Dredging Company, which has the contract for dredging Pearl Harbor and channel, and who may also look after some of the drydock con-...
The work of four years was destroyed in four minutes yesterday afternoon at Pearl Harbor, when the entire frame crib and concrete work in the great naval drydock collapsed and crumpled until the 1000-foot basin was jammed with a chaos of wreckage. The eight-foot layer of concrete at the bottom of the excavation was heaved up with cyclopean force when the water in section two had been pumped out almost, enough to expose it. The crib-work splintered, and the side collapsed.

With hardly a moment’s warning, the great structure of false crib work heaved with its mass of top machinery of pumps, derricks and engines, while the two adjoining sections entirely collapsed and, within four minutes, became part of the mass of splintered timbers, twisted iron and steel and jagged blocks of masonry.

![Disaster Overwhelms Pearl Harbor Project—Three Sections of Drydock Collapse in Mass of Wreckage](image)

**Figure 26. Collapse of Drydock No. 1 (February 17, 1913) (The Hawaiian Gazette, 1913:1)**

**Rushing To Safety.** More than a hundred workmen were engaged in and on all parts of the structure, when a diver emerged from the corner of section three and running along the timbers to the shore shouted that the structure was giving away.

Warnings were shouted from all parts and the men scurried like rats to safety.

Hardly had the last man passed from the structure to the shore, when a mighty surge took place in the center, or number two section. Like a great vessel which has been sunk, the five-storied false crib work rose steadily as if on some gigantic piston rod.

Slowly but surely the timbers emerged from the water, and then began to crumple. There was a rending of huge beams, splitting and tearing from their iron-bound sockets. Great derricks and cranes toppled over on the trembling and crunching mass and smashed through the tough woodwork.

**Two Sections Go Down.** While the upheaval drew all eyes to the center section, it was seen immediately that the adjoining section—one and two—were collapsing, but instead of rising first and falling afterward, they began to sink. There was a hurried withdrawal from the shore bluff, for it was first thought that the bottom was falling out of the basin. With the center coming up and the two sides going down, great masses of water shot in from end to end of the sections while the rush of water into section two, meeting the water spurt up from underneath, caused the rending timbers in mass into and indescribable tangle...

*Honolulu Star Bulletin*

**Contractors Loss May Be Much Reduced**

**Rumor Current That Specifications on Pearl Harbor Drydock Will be Modified**

**Change Would Mean Division of Loss — Hawaiian Dredging Co. Hard Hit and Compromise Would Be Quite Popular**

**February 7, 1914 (pages 1 & 3)**

That the contractors may after all be relieved of a large part of the financial responsibility for the drydock disaster, is the word that has reached Hawaii through unofficial channels. It is stated on good authority that the specifications for construction of the big ship basin are to be slightly changed, in which event the contractors will not face nearly the loss that now confronts them. In any case, the aying up of work for a year, and the destruction of expensive machinery, will be a heavy financial drain on the Hawaiian Dredging Co., so that a sharing of the financial responsibility by the government would be in the line of equity.

Although word of this compromise comes direct from Washington, neither the officers of the Hawaiian Dredging Co. here, nor the navy authorities have received any positive information as to future plans.

"We have heard nothing further than the word to go right ahead according to original specifications, received by cable some days ago," said R.W. Atkinson, of the Hawaiian Dredging Co. this morning. "If there has been any change of
specifications, we have not been notified at this end of the line as yet. We started work yesterday, dredging section 5 with the dredger R.F. Dillingham, which was hastily put in commission after the wreck of the Denison. The latter machine is now tied up alongside of the Waterfront wharf, but it is still quite a [page 1] problem to right it, although considerable of the valuable digging machinery has been saved."

Civil Engineer Samuel Gordon, in charge of Pearl Harbor construction work, stated that no news of any changes in the plans had been received by his department. In fact, it has been a case of mark time on the job for the past week, but this inactivity is explained by the accident to the dredger Denison.

Mr. Atkinson said this morning that he had no information as to the probable date of return of W.F. Dillingham, general manager of the company, who has been in Washington for several months.

Volumes of paper and reports were developed to address the collapse and startup of new work on the drydock. On August 21, 1919, it was reported that the drydock was dedicated with 4,000-5,000 people in attendance.

The major facilities of the naval base and submarine base were constructed between 1910 and 1918. In 1921, a second stage of coastal defense began with the development of Fort Weaver in the Pu’u’ula area, where gun embankments were installed and a larger section of land was integrated into the naval reservation. In the 1930s, lands of the Campbell Estate in Honolulu were developed into naval magazine facilities. Similar development was initiated at Waikiki and Kipapa Gulch. An Army coastal defense battery was built at Pu’uokapolei, and shoreward of that Army and Marine training facilities, including an air field were being constructed. While promises had been made to allow for continued access to estate/plantation lands and fisheries of the Pu’u’ula region, those rights were quickly revoked.

By 1939, war on both the European and Asian front facilitated expansion of Pearl Harbor. In November 1941, construction of the Naval Air Station at Barbers Point was begun on the ‘Ewa Plain, adjacent to Ewa Marine Corps Air Station. After the Japanese attack of December 7, 1941, accelerated development took place, including acquisition of most of lower Waipio and the Waiau-Mānana (Pearl City) Peninsula. The Red Hill fuel storage facility and housing expansion at Makalapa were among the other areas of growth.

Today, the United States Military manages some 14 land areas in the ‘Ewa District. These include:

- NAS Barbers Point, Honolulu
- Iroquois Point/Pu’uloa Housing, Honolulu
- NAVMAGPH West Loch, Honolulu, Waikiki
6. A SUMMARY OF ALOHA STADIUM'S HISTORY

Prior to the construction of the current Aloha Stadium, the primary outdoor sporting venue of Hawai‘i was the Honolulu Stadium, located in the Mo‘ili‘ili district at the corner of King and Isenberg Streets. Opened in 1926, this stadium was largely constructed of wood and was considered outdated by the 1960s. Due to the dilapidated integrity of the structure, construction for a new and updated stadium began in the early 1970s. Aloha Stadium was officially opened on September 12, 1975 at a cost of $37 million, while Honolulu Stadium was closed in the same year and demolished in 1976. The Honolulu Stadium State Park currently occupies the location of the former stadium, with a plaque commemorating the former importance of the site as Hawai‘i’s premium outdoor event location.

Aloha Stadium has a capacity of 50,000 and a parking capacity of 8,000 cars, 150 buses, and 109 disabled spaces. The events hosted by Aloha Stadium include football, baseball, soccer, boxing, religious and music festivals, swap meets, auto shows, motorcrosses, mud races, tractor pulls, concerts, and carnivals. Aloha Stadium is primarily the home of the Hawai‘i Warriors football program. The stadium is unique in that the structure once moved to form either a football or baseball configuration, but the stadium has been locked in the football configuration since January 2007 due to maintenance costs.

Through its 45-year history, Aloha Stadium has been host to a variety of special events with highlights including:

- September 13, 1975 – Crowd of 32,347 arrive to support the University of Hawai‘i (UH) football team against Texas A&I for the stadium’s first season opener.
- April 7, 1976 – The Hawaiians play Jacksonville in the first professional football game.
- August 21, 1976 – The stadium hosts their first National Football League (NFL) Exhibition Game featuring the San Francisco 49ers and San Diego Chargers, where the 49ers defeated the Chargers 17-16 before a crowd of 36,364 fans.
- 1976 – The Stadium is introduced to the 50th State Fair by the Honolulu Jaycees.
- December 2, 1976 – The Stadium is sold out for the first time with 48,767 spectators witnessing UH’s defeat of 21-5 at the hands of eventual national champion University of Southern California.
- Summer of 1979 – The Aloha Flea Market opens and becomes the largest operation of its kind in the state.
- January 27, 1980 – Aloha Stadium became the host of the annual NFL Pro Bowl to a crown of 49,800, whereafter the event would be hosted at the stadium an additional 34 times.
- March 14, 1981 – Andy Gagnan scores a third round Technical Knockout over Manuel abeydo in a co-main event of CBS nationally televised boxing card.
- December 25, 1982 – Debut of the National Collegiate Athletic Association (NCAA) Aloha Bowl with the Washington Huskies defeating the Maryland Terrapins 21-20; the Aloha Bowl would continue to be played at the stadium until Christmas Day 2000.
- March 3, 1985 – The first annual Great Aloha Run has its finish line set in the stadium, where Olympian Duncan Macdonald is the first winner.

- July 26, 1986 – Frank Sinatra performs at the stadium to a crowd of more than 25,000.
- December 25, 1989 – The UH football team makes their first Aloha Bowl appearance to a sold out crowd with the Michigan State Spartans, losing 33-13.
- January 3-4, 1997 – Michael Jackson holds back to back sellout concerts.
- April 19-20, 1997 – The San Diego Padres host a regular season series with the St. Louis Cardinals that draws 77,432 over two days.
- December 25, 1998 – Inaugural Oahu Bowl game between Air Force and Washington; the Oahu Bowl was later moved to Seattle in 2001.
- December 25, 2002 – The Inaugural Hawaii Bowl is held, where Tulane Green Wave defeats UH 36-28 before 35,513.
- November 23, 2007 – The Warriors see their largest crowd of 49,651 as they defeat the Boise State Broncos 39-27 for the school’s first out-right conference championship; December 1 had a crowd of 49,566 see UH go undefeated in the regular season (12-0) to clinch a birth to the Sugar Bowl.
- 2014 – USA vs. Samoa Rugby League Lava Lava Festival
7. THE BIOCULTURAL ENVIRONMENT AND THE CULTURAL LANDSCAPE

To employ the Hawaiian landscape perspective and emphasize the symbiosis of natural and cultural resources, Honua Consulting uses the term ‘biocultural’ to refer to natural and cultural resources, with additional sub-classifications by attributes.

Honua Consulting employs three broad terms that are both well-defined and flexible enough to be used to place traditional cultural areas/properties, naturally occurring non-modified features, archaelogical features, and other areas of cultural significance within a specific spatial-temporal framework. Hawaiian epistemology categorizes ecological regions much like non-indigenous science categorizes different ecosystems in biomes. Hawaiian ecological regions are referred to as wao (realms). While numerous wao exist, focus is placed on the wao most important to this assessment:

**Wao kānaka:** the region, usually from coast to inland plain (exclusive of inland forests), characterized by permanent human occupation, active resource management, and resource modification. This is observable through the presence of archaeological features indicating permanent occupation, including large concentrations of house lot complexes, religious complexes, and fishponds.

**Wao kele:** the inland forest region, including rain-belt forests, characterized by large-scale subsistence systems, active resource management, and resource modification. This is observable through the presence of agriculture-related archaeological features, fewer heiau than the wao kānaka region, and smaller concentrations of house lots.

**Wao akua:** the distant realm inhabited by the gods and demigods, this area was kapu and the general populous only entered the realm with reverence. Wao akua can include the mountains, mountain tops, and ridges of entire islands and/or regions where clouds settle upon the land (thus at varying elevational zones depending on district and region).

A brief further discussion of environmental zones and traditional Hawaiian land management practices is necessary to understand the tangible and intangible aspects of the Hawaiian landscape. Additionally, it is important to point out once again that in the Hawaiian landscape, all natural and cultural resources are interrelated and culturally significant. Natural unaltered landscape features such as rocky outcrops, cinder cones, intermittent streams, or an open plain can carry as much significance as a planted grove of wauke (*Broussonetia papyrifera*) or a Boulder-lined ‘auwai (canal).

Maly presents a narrative of traditional Hawaiian land management strategies and the different environmental zones recorded in *Ka Hoku o Hawai‘i* (September 21, 1916):

Hawaiian customs and practices demonstrate the belief that all portions of the land and environment are related, like members of an extended family, each

environmental zone was named, and their individual attributes were known. Acknowledging the relationship of one environmental zone (wao) to another, is rooted in traditional land management practices and values. Just as place names tell us that areas are of cultural importance, the occurrence of a Hawaiian nomenclature for environmental zones also tells us that there was an intimate relationship between Hawaiians and their environment.

The native tradition of Ka-Miki provides readers with a detailed account of Hawaiian land divisions and environmental zones. While competing in a riddling contest at the court of the chieft Paliku—Kikolo’o’o, the hero, Ka-Miki sparred with Pinu‘au, the foremost riddler of the district of Hiko Paliku (northern Hiko). The riddles covered topics describing regions from the mountain tops to the depths of the ocean, and descriptions of kalo (taro growth), the ala loa (trail systems), and nā mea lawa‘a (fishing practices). As the contest unfolded, it was seen that each of the competitors were well matched. In one of the riddles, Ka-Miki described the various regions of the island of Hawai‘i, extending from the mountain to the sea. Ka-Miki then told his opponent, that if he could rise to the challenge of answering the riddle, his knowledge could be compared to one who has ascended to the summit of the “mauna o Pali‘au” (mountain of Pol‘iahu, or Mauna Kea) (*In Ka Hoku o Hawai‘i, September 21, 1916*).

Through one of the riddles the reader learns about the traditional wao or regions of land, districts, and land divisions of the administrators who kept peace upon the land. The environmental zones include:

1 - Ke kuahiw; 2 - Ke kualon; 3 - Ke kaumana; 4 - Ke ku(a)hea; 5 - Ke kaolo; 6 - Ke wao; 7 - Ka wau ma‘u; 8 - Ka wao kele; 9 - Ka wao akua; 10 - Ka wao l‘a; 11 - Ka wao kānaka; 12 - Ka ‘ama‘u; 13 - Ka ‘apa‘a; 14 - Ka pahe‘e; 15 - Ke kula; 16 - Ka ‘ilima; 17 - Ka pu‘one; 18 - Ka pu‘ina naulu; 19 - Ke kai kohola; 20 - Ke kai ‘oke; 21 - Ke kai uli; 22 - Ke kai puakai; 23 - Ke Pūpolohua-a-Kāne-i-Tahiti.

1 - The mountain; 2 - The region near the mountain top; 3 - The mountain top; 4 - The misty ridge; 5 - The trail ways; 6 - The inland regions; 7 and 8 - The rain belt regions; 9 - The distant area inhabited by gods; 10 - The forested region; 11 - The region of people below; 12 - The place of ‘ama‘u (fern upland agricultural zone); 13 - The arid plains; 14 - The place of wet land planting; 15 - The plain or open country; 16 - The place of ‘ilima growth (a seaward, and generally arid section of the kula); 17 - The dunes; 18 - The place covered by waves (shoreline); 19 - The shallow sea (shoal reef flats); 20 - The deep sea; 21 - The deep blue-green sea; 22 - The yellow (sun-reflecting sea on the horizon); and 23 - The deep upwelling black sea of Kāne a Tahiti (Maly, 2001:3).

The large ‘Ewa moku once encompassed both seaward and high interior plains, the Ko‘olau mountain range’s deep kauwai valleys, and the coastal region of the Waianae range, but this
area has been since been diminished due to political redimensioning (Handy et al., 1972). Handy et al. describe the climate and features of 'Ewa:

The salient feature of 'Ewa...is its spacious coastal plain, surrounding the deep bays ("lochs") of Pearl Harbor, which are actually the drowned seaward valleys of 'Ewa's main streams, Waiehu and Waipō. ...These bays offered the most favorable locality in all the Hawaiian Islands for the building of fishponds and fish traps into which deep-sea fish came on the inflow of tidal waters.

The lowland, bisected by ample streams, was ideal terrain for the cultivation of irrigated taro. The hinterland consisted of deep valleys running far back into the Ko'olau range. Between the valleys were ridges, with steep sides, but a very gradual increase of altitude. The lower parts of the valley sides were excellent for the culture of yams and bananas. Further inland grew the 'area for which the area was famous. The length or depth of the valleys and the gradual slope of the ridges made the inhabited lowlands much more distant from the wa, or upland jungle, than was the case on the windward coast. Yet the wa, here, was more extensive, giving greater opportunity for forage for wild foods in famine time.

The people needed this resource because 'Ewa, particularly its western part, got very little rain in the summer months when the trade winds dropped their moisture in the interior. Stream water for irrigation, however, was always abundant. In the summer, compared with the windward coast, 'Ewa was considerably hotter in the daytime, and warmer at night, often rather windless (1972:469-470).

Based on the descriptions of 'Ewa's climate and the various wao in the Hawaiian landscape, it can be determined that the large 'Ewa moku is not contained to a singular wao. The general vicinity of the project area would be considered "ka pāhe" (the place of wet land planting), "le kula" (the plain or open country), and "ka 'ilima" (the place of 'ilima growth). The high volume of kalo cultivation in 'Ewa supports the "ka pāhe" designation; 'Ewa was famously known for producing the rare and delicious kai variety of kalo, which was described as so delicious that "anyone who married a native of 'Ewa would come and settle there and would never leave" (Handy et al., 1972:471). The vast coastal plains surrounding the bays of Pearl Harbor support the "le kula" designation.

7.1 Historic Sites

During construction of the original Aloha Stadium and its associated parking areas, the land was extensively graded and developed; the stadium site does not contain any newly discovered historic sites nor have any historic sites been discovered within the project area in past studies. McAllister previously identified three loko i'a in the vicinity of the project area:

7.2 Natural Resources

7.2.1 Flora

The vegetation of the project area is a diverse mix of naturalized (species introduced to the islands since the arrival of the Cook Expedition in 1778), ornamental (cultivated plants not thought to be naturalized), and invasive species, with a few occurrences of indigenous and Polynesian-introduced species (Guinther and Lake, 2019). During the botanical survey, no endemic species were discovered within the project area including inspection of Hālawa Stream. The following sections detail the variety of cultural uses of the indigenous and Polynesian-introduced species.

7.2.1.1 Indigenous Species

The indigenous species within the project area include milo (Thespesia populnea) and 'uhualoa (Waltheria indica). Both species are observed uncommonly throughout the project.

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17 The determination of milo as an indigenous species does not have conclusive evidence, although it is most likely indigenous due to its natural range on all Hawaiian Islands aside from Kahoolawe. Even so, milo is also a Polynesian-introduced species and is not invasive.
area and neither are of environmental concern, as they are observed commonly throughout the Islands.

Milo was used frequently by the Early Hawaiians, most notably its wood for 'umeke lā'au (containers made from wood) and canoes. Although kou (Cordia subcordata) was the preferred wood for bowl, dish and platter-making because of its soft grain, milo was the second choice (Hiroa, 1957). It was discovered that milo wood was also used in canoe-making as a second choice to the preferred koa (Acacia koa) because it also attains great size; today, large milo trees are rare and very few trees of koa and milo variety reach large enough heights to fashion the epic “war canoes” (Abbott, 1992). Aside from the wood, milo was also utilized for its fruit to create yellowish-green dyes for clothes and kapa mats (Krauss, 1993). Milo was considered a sacred tree that was prohibited from use by commoners, and many milo trees surrounded the house of King Kamehameha I in Waikiki (Whistler, 2009; Krauss, 1974). Additionally, the yellow flowers of milo are occasionally used in lei, as are the plant’s seeds (McDonald and Weensk, 2003). This indigenous tree remains abundant throughout the Hawaiian Islands.

‘Uhaloa has a range of cultural uses. It is a body form of Kamapua’a and is primarily a medicinal plant. The leaves, stems and roots were pounded, strained and used as a gargle for sore throats, which is a practice that continues today (Abbott, 1992). ‘Uhaloa was also combined with other plants to create a tonic for young and older children and occasionally adults. Canoe builders would also occasionally add the sap of ‘uhaloa to a canoe being made or as a paint for the hulls (Krauss, 1993). This native weed remains abundant throughout the Hawaiian Islands and is still treasured as a natural and safe tonic for bodily ailments today.

7.2.1.2 Polynesian-Introduced Species

Four Polynesian-introduced species were identified within the project area, including niu or coconut (Cocos nucifera), ti or kūi (Cordyline fruticosa), ‘uila or sweet potato (Ipomoea batatas), and ‘ihai (Oallis corniculata). These species have widespread distribution on the Hawaiian Islands and beyond and are not threatened or in danger of extinction.

7.2.1.2.1 Niu

Niu trees are capable of reaching heights up to 100 feet and their fronds grow up to 18 feet long. Niu trees produce small flowers and its round fruit (a drupe or nut) ripens in nine to ten months; the inner lining of the nut is a white, edible pulp referred to as the “flesh” or “meat” which surrounds a hollow containing sweet water (Krauss, 1993). Ancient Hawaiians revered niu as the body of the god Kū, so the planting was men’s work and kapu to women, with a few exceptions (Abbott, 1992). There are many legends about the origins of niu to the Hawaiians Islands, one of which is provided below from the island of Hawai’i regarding the tricksters ‘Aukele-mui-aiiku and Kane-’Apua:

“It is Aukele-mui-aiiku and his brother (Kane-) Apua who bring the first coconut to Hawai‘i. The first time Apua and his brother come from Kahiki they do not bring slips of food plants because they expect to find them growing here. Being almost famished, they return to Kahiki after plantings, and appear off Kaulu- (s)öla’s place in Kahiki with a load of pretended food in the shape of coral rock. Their net landing is laid to the rough surf. Of each plant they are shown they declare that it ‘germinates, sprouts, bears leaves and fruits in Hawai‘i,’ and hold up a piece of coral resembling the shape of the plant. The owners of the food plants cast all away as worthless and the voyagers gather them into the canoes and carry them back to plant in Hawai‘i. The first coconuts in Hawai‘i are planted at Kahalu‘a (where stands the heiau of Waha-ula) and at Kalapana in Puna district, Hawai‘i” (Beckwith, 1970:432).

Another legend credits the arrival of coconuts to Pōkʻaiʻl, “an early voyaging chief from Kahiki, who brought and planted [in Pōk‘ai’i Bay of Waianae] the coconut from which has sprung its grove, famed in song” (Sterling and Summers, 1978:70).

The fronds of niu trees were used extensively in many aspects of Hawaiian culture. Niu leaves occasionally comprised the construction of head lei made using the humu-papa method and floral material was sewn to the leaf (McDonald, 1981). The frond could also be treated as a modern-day cloth, as infusions for dye were strained through the leaf to remove debris before the dyeing process commenced. The sheath was also used when straining medicinal concoctions to be drunk by the afflicted. Fisherman beat the water with coconut fronds when using a net to drive fish into the center, where they were then caught by the gills (Krauss, 1993). Hawaiians also used the fronds in plaiting simple fans, but they did not typically plait the niu leaves for floor mats or baskets (Abbott, 1992). In addition to these daily necessities, Hawaiians also used the fronds for recreation. The game panapana niu was played by children that bent the midribs of the leaflets into a bow, then released it so that it would spring away. Additionally, children would play kīlavala, which was a jumping game played with balls made from the plaited coconut leaves; the children would toss as many as five of these balls at a time (Krauss, 1993). A final example of the use of the coconut frond is in the creation of niu‘a kan‘i (Jew’s harp), an instrument made from the leaflet midrib, which was stiff and hard when dry (Hiroa, 1957).

Although niu fronds proved very useful, the most important part of the niu is the gourd. All parts of the coconut were utilized by ancient Hawaiians in daily activities and the coconut continues to be essential today. The outer part of the shell, termed the husk, is separated from the gourd to create a fibrous material (coir) that Hawaiians used in a variety of ways, particularly for cordage; coir is the twisted fibers that are weaker than sernit, which is the braided rope made from the cordage (Krauss, 1993; Abbott, 1992). The gourd itself is very strong and sturdy and has a variety of uses. Leis can be created using coconut shells that are cut into various shapes, polished, drilled, and strung together; pendants may also be created from these shells (McDonald, 1981). Instruments for hula were crafted from these shells as well, including ula‘ula (gourd rattles), pūnaha (coconut knee drums), and ‘īlili (rattles consisting of three gourds pierced by a stick); pau hula is another drum made for hula, and it was constructed using the base of a coconut trunk rather than the gourd (Abbott, 1992; Krauss, 1993). Food was typically consumed with the fingers except sweet potato poi, which has a liquid consistency and required scoops made from the niu‘a hel (for consumption (Hiroa, 1957). Cups made for drinking ‘awa and medicine were also crafted from niu shells and more
complex cups were reserved for kahuna (priest) use (Abbott, 1992). The niu shells also served as the lids for line containers and comprised bait mortars in ancient fishing practices (Hirao, 1957).

Lastly, the gourd was used recreationally in ki`u, which was a game similar to quoits and played only by ali`i (Krauss, 1993).

The examples of niu use in Hawaiian culture presented above are important and significant, but the use of the inner portions of the coconut are the most well-known. The ancient Hawaiians were able to extract oil from the inner meat of the coconut. Niu oil was primarily mixed with the sap of la`au ferns, and this mixture was then applied to kapa to perfume it. Niu oil was also important in fishing, as it was applied to bait sticks which attracted fish into the fisherman’s nets (Krauss, 1993). When compared to islands in the south Pacific, Hawaiians did not utilize the coconut for dietary purposes to the same extent and its use for food was minor compared to plants like taro and sweet potato. The liquid contained within the nut is termed wai niu (coconut water), and it was drunk by ancient Hawaiians on long journeys where fresh water was unavailable; other island nations of Polynesia were documented as drinking wai niu extensively in comparison (Krauss, 1993; Hirao, 1957).

Hawaiians also prepared coconut cream by grating the inner flesh of the coconut and squeezing it through the fibrous coconut fronds; this cream is and continues to be used to prepare haupia and kūlolo, which are both Hawaiian delicacies (Krauss, 1993). The impact of all parts of the niu tree is easily apparent in all aspects of Hawaiian culture.

7.2.1.2.2 Ti

Ti is the primarily used for its leaves, but all parts of this plant have been essential to Hawaiian culture and daily life. Ti predominantly grows in open forest at lower elevations but has been cultivated near buildings and on the banks of taro patches; the stems are thrust into the ground where desired for propagation. Ti plants typically grow to heights of three to ten or more feet and have oblong leaves that can grow up to four feet long and four to six inches wide (Krauss, 1993). Prior to Western contact, only green-leaved ti grew on the Hawaiian Islands, and this variety is the one that is continued to be most commonly used in Hawaiian customs (Abbott, 1992). Ancient Hawaiians believed that ti plants warded against evil spirits and had the power to heal, leading to their planting around houses and the leaves’ use in rituals of cleansing and healing. During a woman’s period of menstruation, they were confined to the hale pēa compounds in isolation; the women were said to wear lei of ti to procure cleanliness and would carry these cups with them when traveling to summon the protection of the volcano goddess Pele (McDonald, 1981). Today, the ti leaf continues to be regarded as a sacred symbol of the gods and an emblem of protection against evil spirits.

Only the leaves of the ti plant are used in lei making practices, as the flowers and fruits are not optimal for stringing or winding into lei. Ti leaves are used in lei lā‘i, which are worn open-ended in a horseshoe fashion around the neck, in the haku (arrange-in-a-braid) method as the center plait, and the wīlī method as the center core to which flowers and fruits are attached (McDonald, 1981; Krauss, 1993). Aside from being used in the lei, ti leaves also comprise pūʻōlo lā‘i, which are used to store and carry perishable items because the cool leaves prevent the fresh flowers from drying and withering; pūʻōlo lā‘i continues to be the best receptacle in which to store lei today. Lei of ti were worn by hula dancers, and the leaves of ti were essential in decorating the altar of Laka in the hīlāu hula (McDonald, 1981).

Ti leaves were a vital part of ancient Hawaiian cooking techniques. Ti leaves were the equivalent of plastic wrap, waxed paper, cloth wrappers and aluminum foil in the kitchen, as they were used to keep the food clean, segregate different foods, serve as wrappers, and provide moisture for easy steaming in both pūlēhu (broil) and imu (underground oven) cooking. Before cooking, some foods were wrapped in ti leaves using the liwau (principally for fish) and luau (for a combination of foods) techniques to protect the food from burning or drying out. After cooking was completed, the Hawaiians would eat the food with their fingers directly from ti leaves, which also functioned as plates. Ancient Hawaiians did not typically consume the ti plant, except during times of famine when other crops had failed (Abbott, 1992). The root of the ti plant contains fructose, which would caramelize when steamed in an imu; both children and adults could consume sections of the cooked root as a sweet, but this was not an everyday occurrence (Krauss, 1993). Fisherman also used ti leaves in hukilau nets to lead fish into the center of the net, and in bait traps and lures (Abbott, 1992; Hirao, 1957). The ti leaf and root served a purpose in all aspects of the Hawaiian diet, from direct consumption and catching prey, to the preparation and service of the food.

Ti was also an important medicinal plant to the ancient Hawaiians. To reduce a fever, all or part of the body was wrapped in ti leaves to promote sweating (Abbott, 1992). Similarly, the leaves were dipped in cold water and laid over foreheads to cool fevers and relieve pain of headaches (Krauss, 1993). In addition, hot packs for physical therapy purposes were created by wrapping warm rocks in ti leaves and applied to injured areas (Abbott, 1992).

In addition to these essential contributions into Hawaiian culture and life, ti also contributed to apparel and recreation. Rain capes were fashioned from ti leaves to afford protection from moisture to those who spent extended periods of time in the forests (Abbott, 1992). Additionally, ti leaves provided suitable material for comfortable sandals that were occasionally worn over rough coral or lava flows, as ancient Hawaiians typically went barefoot (Krauss, 1993). In regard to recreation and sport, the ti plant had many purposes and functions. The root of ti can provide a dark colored dye, which was used to stain surfboards and hulls of canoes (Hirao, 1957; Krauss, 1993). More directly, the leaf-head cluster of the ti plant comprised the simplest form of sleds, where individuals sat on the leaves and held the stalk to steer; ti-leaf sliding was called ho`ohe`e ki. In games of darts (pah/fah/lua), a ti leaf was used as a target, and the winner was the individual whose dart landed nearest to the ti-leaf goal (Krauss, 1993). Lastly, pālāi (ti-leaf whistles) were crafted by rolling a ti leaf around itself at one end and then rolling the other end to form a funnel shape; this whistle was not considered a musical instrument, but more of a play-things (Hirao, 1957). From the functions provided in the preceding paragraphs, the impacts of the ti plant is easily visible, and it can be regarded as one of the most important plant species of the Hawaiian Islands.

7.2.1.2.3 ʻUala

ʻUala was an extremely important food source to the ancient Hawaiians, second only to kaló...
(Colocasia esculenta) in providing carbohydrates and minerals; the importance of 'ulaa was even greater in arid areas that were unsuitable for kalo growth (Abbott, 1992). 'Uala was raised primarily for the tubers, but the leaves may also be consumed. This crop was typically cooked in an imu and chunks may be mashed and eaten as poi; poi 'ulaa fermented quickly to create a sour flavor that was greatly enjoyed. 'Uala was also used to prepare pierce, where it is mashed then mixed with coconut (Hiroa, 1957). An additional usage as food involved rapid fermentation, which produced a beer termed 'ulaa 'a'wa (Krauss, 1993).

'Uala was used additionally to remove bitterness from wood bowls. Poi 'ulaa was placed in the bowls and left to ferment continually over weeks until the bitter taste of the wood was replaced with sweetness; poi 'ulaa was preferred to poi kalo because it has a greater drawing power and raises a froth after a few days (Hiroa, 1957). Additionally, 'ulaa would be used with a combination of fish, shrimp, and kalo, then attached to a lau'au melomelo (a stick trailed behind a canoe as bait) (Abbott, 1992). There are accounts of 'ulaa being used in other baits for fishing (Hiroa, 1957).

The cultural significance of 'ulaa was apparent in many aspects. Kamapua'a or the pig man Kāne'pua'a were called upon in preparing 'ulaa fields to ensure a successful crop. 'Uala is also regarded as an emblem of Lono, the god of peace, planting and fertility; newly grown 'ulaa would be dug by hand from the field after the first good rain and offered to Lono as a sacrifice (Abbott, 1992). After this, a kapu was placed on the 'ulaa field so as not to disturb the crop during growth. 'Uala itself was not regarded as a sacred plant, as women were permitted to cultivate it; alternatively, kalo was kapu to women and could only be cultivated by men (Handy et al., 1972).

7.2.1.2.4 'Ihi'ai

'Ihi'ai – also known as 'hi or the yellow wood-sorrel – is widely considered to be a weed due to its self-pollination and rapid growth in open spaces. This species has an extremely widespread across the globe, particularly in tropical and temperate zones and may be seen in gardens, lawns, pastures and arable land. Despite its apparent abundance, 'hi'ai was not a widely used plant for the ancient Hawaiians. Most notably, the entire plant would be mixed with 'ōhī'a (Engenia malaccensis) bark and 'awīkiwī (Canavalia pubescens) vine, pounded, strained with water, heated, then applied to itchy skin or skin disorders as a balm (Krauss, 1993). Aside from this remedy, there is no indication of 'hi'ai being utilized for dietary needs in ancient Hawai'i.

Table 8 provides a listing of the species of cultural concern found within the project area.

### Table 8. Indigenous and Polynesian-Introduced Plant Species of the Project Area

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name(s)</th>
<th>Abundance in Project Area</th>
<th>Endangered?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thespesia populnea</td>
<td>Milo</td>
<td>Uncommon</td>
<td>No</td>
</tr>
</tbody>
</table>
Kōkea-moku may be another name for the ‘aumākua (family gods) of kōlea birds that are elsewhere referred to as Kumukahi, who “was able to take the form of a man or of a kōlea bird at will” (1970:120). One moʻokolo details the bird hunter Kumu-hana recklessly killing the kōlea for sport, to which his neighbor, who worships Kumukahi, warns about the sacrilege. Kumu-hana does not heed his neighbor’s warning, so Kumu-hana is attacked by a flock of plover, “who enter his house and peck and scratch him to death. The place where he lived is called Au-a-kōlea to this day” (Beckwith, 1970:137-138).

Kōlea are protected under the Migratory Bird Treaty Act (MBTA), which prohibits the taking, possessing, importing, exporting, transporting, selling, purchasing, bartering or any such offers of parts, nests or eggs of any bird listed under the Act. Although the kōlea occurs within and near the project area, its extremely large range and population size prevents it from entering Vulnerable status.

Neither the aʻeʻo nor ‘aʻukū‘u are specifically associated with any well-known Hawaiian myths, but subordinate deities and sometimes the great gods appear in all bird bodies. Beckwith shares that all “species of birds which are inhabitants of the islands...appear in myth as kindred and servants of gods who are worshipped as family guardians, or the god himself may manifest himself on earth in bird form and be worshiped under the name of his particular manifestation (1970:92). Therefore, all indigenous species observed within the project area have cultural significance, but the ‘a‘e‘o, a‘u‘u, and ‘ū‘ūi were all incidental observations and therefore do not depend on the project area’s current layout for survival.

Guinter and Lake (2019) noted that the indigenous state-listed manu o kū or white tern (Gygis alba) may utilize the monkey-pod trees surrounding the stadium for nesting, although none were observed during the survey. Guinter and Lake suggest that:

Prior to removal or trimming, a tree should be inspected by a qualified biologist to determine if White Tern nesting or brooding activity is underway within the tree (2019:18).

Additional endemic and indigenous seabirds such as the endangered ‘u‘u (Pterodroma sandwichensis) and critically endangered ‘a‘o (Puffinus newelli) “may overfly the stadium site during their nesting season,” but the current stadium site is not an ideal habitat for these seabirds’ nesting (Guinter and Lake, 2019:18-19). The pueo (Asio flammeus sandwichensis) is listed as endangered on O‘ahu but does not have a suitable habitat within the project area.

In regards to the endangered ʻōpe‘ape‘a or Hawaiian hoary bat (Lasiurus cinereus semotus), although not observed during the mammalian survey, Guinter and Lake suggest:

To avoid potential deleterious impacts to roosting bats it is recommended that no woody vegetation taller than 4.6 m (15 ft), be removed between June 1 and September 15, the period in which roosting bats are potentially at risk from vegetation clearing (2019:20).
7.2.3 Hālawa Stream

Hālawa Stream is a 22 mile (35.4 km) long perennial stream that crosses the south-eastern portion of the project area in the existing parking lot, where the stream is confined within a concrete channel below the general site elevation; Hālawa Stream extends beyond the project area and empties into East Loch, Pearl Harbor to the west. Hālawa Stream is within the Hālawa watershed which is medium size, steep in the upper watershed, and with embayment. The segment of Hālawa Stream that bisects the Stadium parking lot is considered the lower reach of the stream while the estuary is south-west of the project area (Parham et al., 2008).

In the Transit-Oriented Development (TOD) Plan developed in preparation for the Aloha Stadium Rail Station, it was found that:

Some members of the public dismiss the stream as merely a functional conduit for storm drainage, while others see it as an undervalized resource that could be appreciated by members of the community. In all the development scenarios considered, [Hālawa] Stream is regarded as an asset that could act as an open space resource as well as a connection that facilitates mauka-makai pedestrian and bicycle movement (2017:32).

An interview with the caretakers of Loko Pu‘aiu in Kaluaau uncovered that Hālawa Stream was once clean and flowed freely out into East Loch prior to the development of Aloha Stadium. Concern was expressed about water diversion and depletion during construction of the New Aloha Stadium Entertainment District that will impact other fresh water resources.

7.2.4 Rain Names

Akana and Gonzalez in Hānau Ka Ua: Hawaiian Rain Names explain the significance of the wind and rain in Native Hawaiian culture:

In the mind... of our Hawaiian kūpuna, every being and everything in the universe was born. Our kūpuna respected nature because we, as kānaka, are related to all that surrounds us – to plants and creatures, to rocks and sea, to sky and earth, and to natural phenomena, including rain and wind. This worldview is evident in a birth chant for Queen Emma, “Hānau ke ali‘i, hānau ka ua me ka makani” (The chiefess was born, the rain and wind, too, were born). Our kūpuna had an intimate relationship with the elements. They were keen observers of their environment, with all of its life-giving and life-taking forces. They had a nuanced understanding of the rains of their home. They knew that one place could have several different rains, and that each rain was distinguishable from another. They knew when a particular rain would fall, its color, duration, intensity, the path it would take, the sound it made on the trees, the scent it carried, and the effect it had on people (Akana and Gonzalez, 2015:30).

To the Native Hawaiians, no two rains are ever the same. Rain can be distinguished based on its intensity, the way it falls, and its duration, among other things.

The following contains a selection of known rains or winds associated with the geographic area of concern.

7.2.4.1 Wa‘ahila Rain

The Wa‘ahila rain is associated with Nuu‘anu, O‘ahu and is also found on other parts of O‘ahu. Wa‘ahila is also the name of a wind and ridge between Mānoa and Pāiolo.

Rain of Hālawa, O‘ahu

No laila, ‘o māku o ka Ahahui Hooikaika Kristiano holo‘oko‘a o ka ua Wa‘ahila o Hālawa, ‘Ewa, ma o ko māku kōmike lā, ke komo pū aku nei e ka‘ana pū i nā ‘inea o keia maua lā ‘e‘e‘e‘a me nā māku i ho‘onele ‘a i ka lei‘ole, ka ‘ohana a me nā pili kana me ke kau nui aku i maluhia mai ko kākou pu‘uhonua a me ka ikaika mai.

Therefore, we, on behalf of the entire Ahahui Hooikaika Kristiano of the Wa‘ahila rain of Hālawa, ‘Ewa, through our committee, join in sharing the hardships of these tragic days with the parents, family, and relatives who have been deprived of their children, with hopes for peace and strength from our refuge.

From a message of condolence from members of the Christian Endeavor Society. Note: “Pu‘uhonua” or “refuge” probably refers to Jesus Christ (Akana and Gonzalez, 2015:272).

Nani Hālawa i ka ua Wa‘ahila

Hālawa is beautiful in the Wa‘ahila rain

Ke kūpū maill a luna o ‘Aiea

Remaining above ‘Aiea

From George M. K. Askai o Kulokoa’s response to a name, or riddle, printed in the newspaper Kuokoa Home Bula (Akana and Gonzalez, 2015:272).

7.2.4.2 Kuahine Rain

Kuahine or Tuahine is the rain primarily associated with Mānoa, O‘ahu, however, it is also found in other parts of O‘ahu, including ‘Ewa.
Rain of Kahui, Central O'ahu

He aha lā ka mea lena i uka o Kahui?
He Kūhine lāua me ke Kī'ōwao

What is expanding in the uplands of Kahui?
The Kūhine and the Kī'ōwao.

From a mele inoa (name chant) for chiefs (Akana and Gonzalez, 2015:114).
The Kī'ōwao is a cool mountain rain that also brings wind and fog with it. Kahui, the place name mentioned in the mele inoa above, is located in Kaluaao, ʻEwa.

7.2.4.3 Nāulu Rain

Nāulu is a sudden shower that is associated with places throughout Hawai'i, including Kaupe'a, ʻEwa. Nāulu is also the name of a shower cloud and a wind. In Hawaiian epistemology, sudden showers are associated with the akua (god) Lono, whose domain is that of agriculture.

Rain of Kaupe'a, O'ahu

ʻAʻole au e hele i ke kaha o Kaupe'a
Kēhaka kūpā koi li a ka lā i ke kula
Ua kū pono ʻaʻela ka lā i ka piko o Wākea
Oa i ke ahe a ka makanī Mānununu
I ka hapahapai mai a ka makanī ʻAo'aoa
Ke koi lā i ke ao o ka Nāulu e hanini i ka wai
Oa iho ia nā kupa kamaaina i ka wai a ka ʻōpua
Ke halihali ʻaʻela nā ʻōpua i ke awa lau

I shall not tread Kaupe'a's expanse
That stretch where the sun beats down on the plain
The sun is right overhead, at the navel of Wākea
I am spared by the Mānununu wind
By the uplifting ʻAo'aoa breeze
Urging the Nāulu storm clouds to pour down their waters
The natives here survive on water from the clouds
Which billowing clouds carry along to the branching lochs

From a mele by Hīaikaikapiopele as she traveled over the hot stretch of land near Pu'uloa, O'ahu (Akana and Gonzalez, 2015:195).

7.2.5 Wind Names

Winds, like rains, can be unique and distinctive to an individual location. The most famed of Hawaiian moʻolelo about winds is "Moʻolelo Hawaiʻi o Pakaa a me Kuʻa-Pakaa, na Kahu Iwikuamoo o Keawenuiaumi, ke Aliʻi o Hawaiʻi, a o na Moopuna hoʻi a Laamaomao" or "The Hawaiian Story of Pakaʻa and Kuapaka, the Personal Attendants of Keawenuiʻumi, the Chief of Hawaiʻi, and the Descendants of Laamaomao." This moʻolelo was translated into the English book The Wind Gourd of Laʻamaomao by Moses Kuæa Nakualu and published in 1902 and has been reprinted many times for the last one hundred years. This effort has assisted in keeping this important moʻolelo within the discourse on Hawaiian history and natural resource management. Many have written about the gourd's mythical properties, as it is said to contain all the winds of Hawaiʻi. More than myth, the gourd itself exists in physical form and was last owned by King David Kalākaua. Today, it is held in the collection of the Bishop Museum (Figure 27).

According to this moʻolelo, the descendants of Laʻamaomao, the wind god, used his wind gourd, Ka Ipu Makani o Laʻamaomao, to control the winds and cause the demise of their enemies. Pakaʻa and his son Kiapākaʻa, Laʻamaomao's descendants, control the winds by chanting the wind name, which recalls that particular wind from the gourd. Each wind name is associated with a specific ahupuaʻa or place. Pakaʻa passed on his knowledge of the wind names and the gourd to Kiapākaʻa, who called on all of the winds to destroy the canoe fleet of Pakaʻa's enemies in the Kahwa Channel separating Oʻahu and Molokaʻi.

The following is an excerpt from the chant naming the winds of Oʻahu, focusing particularly on the wind names of ʻEwa:

Moaʻe-kū is of ʻEwaloa,
Kēhau is of Waʻōpua,
Waikōloa is of Lihueʻe,
Kona is of Puʻukapiopele,
Māunuunu is of Puʻuloa...

(Nakualu, 1901)

According to this account, Moaʻe-kū, Kona, and Māunuunu are the winds typically found in the ʻEwa moku, particularly Honouliuli. Moaʻe-kū is considered to be a foreign wind that blows from another land (He makanī mai Kahiki mai). Moaʻe are trade winds, and the Moaʻe-kū is considered to be a very strong trade wind. Kona is the name of the wind associated with Puʻukapiopele and this is also a famous leeward wind throughout Hawaiʻi. Māunuunu is the name of a strong, blustering wind typically associated with Waʻalae and Puʻuloa.

7.2.5 Wind Names

Winds, like rains, can be unique and distinctive to an individual location. The most famed of
Figure 27. Ka Ipu Makani o La‘amaomao is a historic calabash in the collection at Bishop Museum that was once owned by King David Kalakaua.

In the epic tale, “Ka Moʻolelo o Hīʻakaikaʻapoliʻopele,” Hīʻaka offers a mele while traveling through the hot plains of Kaupė’a in ‘Ewa:

‘Aʻole au e hele i ke kaha o Kaupė’a
Kēlā kaha kūka kolī a ka lī i ke kula
Ua kūponoʻaʻa la i ka piko o Wākea
Ola ike ahe a ka makanī Mūnuumu
I ka hapahapai mai a ka makanī ‘Aoʻaoa

This mele mentions the Mūnuumu wind and the ‘Aoʻaoa breeze which spare her from the intense heat of the Kaupė’a plains in ‘Ewa. ‘Aoʻaoa, or ‘aoa, is referenced a sea breeze.

7.2.6 Loko I’a of Keawalauopu’uloa

In preparation for this CIA, Kehaulani Lum, Kimberly Moa, and Kahale Unciano were interviewed and consulted for their expertise in loko i’a maintenance and restoration efforts, specifically Loko Paʻai‘au, which is in close proximity to the project area (Section B.2.4). Loko Paʻai‘au is located in ‘Ewa moku, more specifically in Kalaʻaʻau ahupua‘a and Paʻai‘au ‘īli; the McGrew Point Navy housing currently resides near Loko Paʻai‘au. This loko i’a is within Keawalauopu’uloa (the many harbored sea of Pu’uloa) which once contained more than 20 different loko i’a of the ‘Ewa moku; only three loko i’a remain today, of which Loko Paʻai‘au is the most accessible. Restoration work of Loko Paʻai‘au by the Navy, Hawaiian civic clubs, and ‘Akea community members began in September 2014; Pono Pacific cleared the excessive mangrove tree growth by hand in 2013 prior to this project’s beginning phases (NAVFAC, 2016:1). Since this point, extensive efforts have been made to restore Loko Paʻai‘au to its former glory of ancient Hawai‘i.

Loko Paʻai‘au was built about 500 years ago (1500s-1600s) by Mōʻi waihine (queen) Kalanimanuia. Kalanimanuia was the daughter of Kūkini and came from a family with a royal lineage to O‘ahu. She was the first Mōʻi waihine and reigned for 65 years. Her reign was marked as a time of peace, which is attributed to her efforts to keep agricultural and food resources abundant. Kalanimanuia lived in Kala‘au and is responsible for building Loko Paʻai‘au as well as Loko Opu and Loko Paʻakea. These loko i’ao were valuable resources that supplied the people with food and sustenance, which kept a time of peace and prosperity on O‘ahu. Loko Paʻai‘au was traditionally fed by water supplied from nearby lo‘i kalo. Today, the loko i’a has been heavily impacted by development and a loss of natural resources.
7.3.1 ʻOlelo No’eau

ʻOlelo no’eau are another source of cultural information about the area. ʻOlelo no’eau literally means “wise saying,” and they encompass a wide variety of literary techniques and multiple layers of meaning common in the Hawaiian language. Considered to be the highest form of cultural expression in old Hawai‘i, ʻolelo no‘eau bring us closer to understanding the everyday thoughts, customs, and lives of those that created them.

The ʻolelo no‘eau presented here relate to land divisions near the project area that may give insight to knowledge about the location including ‘Aiea, Hālawa, and places located within the larger moku of Ewa. These ʻolelo no‘eau are found in Pukui’s ʻOlelo No‘eau: Hawaiian Proverbs & Poetical Sayings (1983). The number preceding each saying is provided.

80 ʻAina ko‘i ʻula i ka lepo.
Land reddened by the rising dust.
Said of ‘Ewa, Oʻahu.

105 Alahulu Pu‘u’ole, he alohele na Ka‘ahupāhau.
Everywhere in Pu‘u’ole is the trail of Ka‘ahupāhau.
Said of a person who goes everywhere, looking, peering, seeing all, or of a person familiar with every nook an corner of a place. Ka‘ahupāhau is the shark goddess of Pu‘u’ole (Pearl Harbor) who guarded the people from being molested by sharks. She moved about, constantly watching.

123 Anu o ʻEwa i ka i‘ama mau leoa e. E hāmāu!
ʻEwa is made cold by the fish that silences the voice. Hush!
A warning to keep still. First uttered by Hīakaa to her friend Wahine‘omao to warn her not to speak to Lohia‘u while they were in a canoe near ʻEwa.

274 E hāmāu o makani mai aua‘i.
Hush, lest the wind arise.
The Biocultural Environment and the Cultural Landscape

Hold your silence or trouble will come to us. When the people went to gather pearl oysters at Pu‘uloa, they did so in silence, for they believed that if they spoke, a gust of wind would ripple the water and the oysters would vanish.

385 ʻEwa kai lumahuna i. ʻEwa of the drowning sea. An epithet applied to ʻEwa, where kauwā were drowned prior to offering their bodies in sacrifice.

386 ʻEwa nei a Laʻakona. Great ʻEwa of Laʻakona. Laʻakona was a chief of ʻEwa, which was prosperous in his day.

493 HaunāleʻEwa i ka Moa ʻe. ʻEwa is disturbed by the Moaʻe wind. Used about something disturbing, like a violent argument. When the people of ʻEwa went to gather the pipi (pearl oyster), they did so in silence, for if they spoke, a Moaʻe breeze would suddenly blow across the water, rippling it, and the oysters would disappear.

661 He kai pūhi nehu, pūhi laka ke kai o ʻEwa. A sea that blows up nehu fish, blows up a quantity of them, is the sea of ʻEwa.

768 He Kīhī o ʻEwa; he pāli o Nu‘uanu; he kula o Kulaokahu; he ʻiki mai koe. ʻEwa is a long way off; Nu‘uanu is a cliff; Kulaokahu is a dry plain; but all will be here before long. Said of an unkept promise of food, fish, etc. Oʻahu was once occupied by evil beings who invited canoe travelers ashore with promises of food and other things. When the travelers asked when these things were coming, this was the reply. When the visitors were fast asleep at night, the evil ones would creep in and kill them.

1014 Hoʻahewa na nihi i kaʻaʻahupāhau. The man-eating sharks blamed kaʻaʻahupāhau. Evil-doers blame the person who safeguards the rights of others. Kaʻaʻahupāhau was the guardian shark goddess of Pu‘uloa (Pearl Harbor) who drove out or destroyed all the man-eating sharks.

1023 Hoʻi aku la kaʻōpua i ke awa la o Puʻuloa. The horizon cloud has gone back to the lochs of Pu‘uloa. He has gone home to stay, like the horizon cloud that settle in their customary places.

1126 Huhui naʻōpua i Awa lau. The clouds met at Pearl Harbor. Said of the mating of two people.

1263 I Waialua ka poʻina a ke kai, o ka leo kaʻō Ewa e hoʻolono nei. The dashing of the waves is at Waialua but the sound is being heard at ʻEwa. Sounds of fighting in one locality are quickly heard in another.

1331 Ka ʻi a hāmā leo o ʻEwa. The fish of ʻEwa that silences the voice. The pearl oyster, which has to be gathered in silence.

1357 Ka ʻi a kūhī lima o ʻEwa. The gesturing fish of ʻEwa. The pipi, or pearl oyster. Fishermen did not speak when fishing for them but gestured to each other like deaf-mutes.

1686 Ke awa la o Puʻuloa. The many-harbor sea of Puʻuloa. Puʻuloa is an early name for Pearl Harbor.

1698 Ke hoʻiʻaʻe la ka ʻōpuʻa i Awa lau. The rain clouds are returning to Awa lau. Said of a return to the source.

1721 Ke kai heʻe nehu o ʻEwa. The sea where the nehu come in schools to ʻEwa. Nuhu (anchovy) come by the millions into Pearl Harbor. They are used as bait for fishing, or eaten dried or fresh.

1776 Ke one kūlima laula o ʻEwa. The sand on which there was a linking of arms on the breadth of ʻEwa. ʻEwa, Oʻahu. The chiefs of Waikiki and Waikiki were brothers. The former wished to destroy the latter and laid his plot. He went fishing and caught a large niuhi, whose skien he stretched over a framework. Then he sent a messenger to ask his brother if he would keep a fish for him. Having gained his consent, the chief left Waikiki, hidden with his best warriors in the “fish.” Other warriors joined them along the way until there was a large army. They surrounded the residence of the chief of Waikiki and linked arms to form a wall, while the Waikiki warriors poured out of the “fish” and destroyed those of Waikiki.

1855 Ku ʻe ʻEwa; Noho iho ʻEwa. Stand-up ʻEwa; Sit-down ʻEwa. The names of two stones, now destroyed, that once marked the boundary between the chiefs’ land (Kuuʻe ʻEwa) and that of the commoners (Noho iho ʻEwa) in ʻEwa, Oʻahu.

2152 Mehamehawe no o Puʻuloa, i ka hele a Kaʻaʻahupāhau. Puʻuloa became lonely when Kaʻaʻahupāhau went away. The home is lonely when a loved one has gone. Kaʻaʻahupāhau, guardian shark of Puʻuloa (Pearl Harbor), was dearly loved by the people.
The Biocultural Environment and the Cultural Landscape

7.3.2 Mele

Honua Consulting completed searches of mele written about 'Aiea, Hālawa, and the land sections within the 'Ewa moku. Maui historian Inez Ashdown wrote in 1976 about the importance of mele:

The natives of Hawai‘i Ne‘i saw the Creator in everything and the Haku Mele or Music Masters delighted in presenting the chants and songs, mele and oli, to inspire the people. Such mele tell of God’s assistant spirits which, to the imaginative natives, represented the winds, rains, and so on. Each spirit of creation was depicted as male or female and was given a personality and a name indicative of purpose. Hence the name of the volcanic action creating and cleansing the earth. She is beautiful, alluring, desirable. She also is unpredictable because she is temperamental and usually full of fiery emotions. She is an old woman asking help when she lies to test mortals, and woe betide anyone who is rude or inconsiderate of this form of an older person to whom respect and Aloha must be given (Ashdown, 1976:3).

7.3.2.1 Pā'au'au Waltz

The following mele, written by John U. Iosepa, is dedicated to Pā'au'au in reference to the home and pond on the Pearl City peninsula, which is situated across the East Loch from Aloha Stadium, west of Moku‘ume‘ume. “Mo‘e,” which appears in Verse 1, Stanza 2, is the ancient name for the trade winds that frequent this area. The reference to “la hāmāku kū” (Stanza 4) alludes to the way that ancient Hawaiians searched for and harvested oysters, which required silence (King, 1923).

Pā'au'au Waltz

Ha‘aheo Pā'au'au i ka nani
Kilikila i ka pāi a ka Mo‘e
E walea ana pahai ka 'olu
I ka ho‘omeno aaka i a la hāmāku leo
Pau‘ole ko‘u ho‘ohili

Proud is Pā'au'au in its beauty
Majestic is the stirring of the trade winds
Delighting in the pleasant comfort
Cherished for the pearl oyster sought in silence
My delight is boundless

Hui:
Pā'au'au Waltz

E ka mea hou o ka 'āina
Ahe 'āina (u kaulana)
Mai na kū puna mai
Aloha Pu‘ulōle aha hele nō
Ka‘ahupāhau, Ka‘ahupāhau

The news of the land
The news of the land
The news of the land

Chorus:
Shells of 'Ewa throne of people
Coming to learn
A land famous
From the ancient times
All of Pu‘ulōle, the path trod upon
Ka‘ahupāhau
All of Pu‘ulōle, the path trod upon
Ka‘ahupāhau

Nani Ka‘ala hemolele ika mālie
Kaihiwai ka‘ala a‘o 'Ewa
E kī‘ana i ka makanī o ka 'āina
Hea ka Mo‘e iia a u e ke aloha
Kilikila o Polena noho i ka ‘olu
La home ho‘ohilā ika malihini
E walea ana i ka ‘olu o ke kiawe
I ka pā kolonahā a ke Kū

Beautiful Ka‘ala, sublime in the calm
Famous mountain of 'Ewa
That fetches the wind of the land
The tradewind calls, “here I am, beloved”
Majestic Polena in the coolness
Home delighted to visitors
Relaxing in the coolness of the kiawe
And the soft blowing of the Kiu wind
8. ORAL RECORDS, INTERVIEWS AND CONSULTATIONS

8.1 Oral Histories and Past Studies

In 2013, the 'Aiea Community Association sponsored and published a thorough oral history of residents and plantation workers in 'Aiea titled 'Aiea: Yesterday, Today, Tomorrow. Many of the interviews provided an in-depth look at the Hālawa Camp, which was located at the site of the current A'ohana Stadium. This camp was the housing provided to Honolulu Plantation workers of various ethnicities. Provided below are selected interviews of the larger oral history project that specifically referenced Hālawa and the Hālawa Camp, with insight also provided about the bombing of Pearl Harbor from the perspective of those living in Hālawa and 'Aiea.

8.1.1 Oral History Interview with Ayame Mitsuda

May 1996
By: Richard R. Ferris, edited by Arlene Seto Ching

Background

Ayame "Amy" (née Kawanishi) Mitsuda grew up in Hālawa Camp where her family ran the Kawanishi Store. Richard R. Ferris of 'Aiea High School interviewed Mrs. Mitsuda at her home in 'Aiea. Richard transcribed and turned in the interview as part of a project for his Hawaiian History class.

Summary

Mrs. Mitsuda shared that she was born in 1915 in a village next to the Hālawa Stream, near the current A'ohana Stadium, and grew up on the Honolulu Plantation. She attended the 'Aiea School, also near the Stadium, from fourth through eighth grade. The plantation hospital was behind the hill that sits on Kamehameha Highway, and all those who lived on the plantation would go to this hospital for any medical needs. On December 7, 1941 (the day of the Pearl Harbor bombing), Mrs. Mitsuda shared that her parents were close enough to see and experience the attack at their store in Hālawa Village. As a person of Japanese ancestry, Mrs. Mitsuda detailed the prejudice against her father following the attack. After marrying, Mrs. Mitsuda shared that the plantation's lease on the land of Hālawa Camp had ended, so she and her family were forced to move out of their home and moved into a lot in 'Aiea (‘Aiea Community Association, 2013:19-21).

8.1.2 Hālawa Camp Recollections with Shigeo Shimabukuro, Natsuko Chagami, and Hisao Shimabukuro

December 1992

Background

The Shimabukuro family grew up in Hālawa Camp, on the site of the current A'ohana Stadium. The three family members interviewed provided information about their daily lives on the plantation camp.
unheard of. Hisao recalled an incident when he and other boys of the camp consumed poison nuts and while he had minimal symptoms, the most serious cases involved comas; this incident was reported in the Honolulu newspapers. Hisao and his father tended to a vegetable garden in a clearing between sugar cane field sections near the Hālawa Stream; watercress was planted in a spot near the present Aloha Stadium (‘Aiea Community Association, 2013:40-52).

8.1.3 Oral History Interview with Leovigildo E.C. Patacsl Jr.

July 20, 2007
By: Arlene Seto Ching and Jordan M. Higa

Background
Leovigildo E.C. “Leo” “Butch” Patacsl Jr. was born in May 1945. He is a retired State of Hawai‘i computer programmer. Leo is the father of Christopher and Jamie Ann Patacsl. Leo’s parents were Leovigildo E.C. “Leo” “Pops” Patacsl Sr. and Maria Sabanaal Ventur Patacsl. He and his sisters Betty Jane, Loretta Jean, and brothers Richard and David were raised in a home on ‘Aiea Heights in the 1950s-1960s.

Summary
Leo shared that his father would frequently take him to an open-air theater within Hālawa Housing, where Aloha Stadium now sits; the theater used to be where the fifty-yard line is in the stadium. He also would swim in the Hālawa Stream in the area of lower Hālawa Housing and the stream was called “the Dam” by the kids who would swim in it. The old Hālawa Shopping Center was once on Kamehameha Highway and contained a Piggly Wiggly, barbershop, shoe repair, etc. before those shops moved to the old Moanalua Shopping Center, which was demolished then rebuilt (‘Aiea Community Association, 2013:59-165).

8.1.4 Excerpts from “Pearl Harbor Dead…and others” by Fred H. Kenfield

Background
Fred H. Kenfield of St. Petersburg, Florida, former U.S. Navy Pharmacist’s Mate 2-C, served at ‘Aiea Naval Hospital in 1946. When the Navy learned that his civilian profession was in the mortuary business, he was assigned to the naval cemetery in Hālawa Valley. This cemetery was used until the cemetery at Punchbowl was built. He co-authored an article on the cemetery, “Pearl Harbor Dead…and others” with George W. Thomas, in Casket & Sunnyside, June 1946.

Summary
Two days after the Pearl Harbor attack, the first burials were made in the newly established Hālawa Naval Cemetery on December 9, 1941. Many of the bodies were unidentified due to a lack of wartime provisions. The bodies were wrapped in canvas with their names, if identified, and buried in graves laid out side by side. The bodies were all eventually removed and sent home; there are no longer any interments in Hālawa Naval Cemetery. The cemetery contains approximately 1,500 graves (‘Aiea Community Association, 2013:234-235).
8.2.1 Interview with Scott Fernandez, President, E.K. Fernandez Shows

Date of interview: August 2019
Interviewee: Kanekapukalani Scott Fernandez
Interviewer: Trisha Keaulani Watson
Location: 330 Sanatoga Road Waikiki, Hawaii

Biography
Kalama Kalei Mahoe was a Hawaiian woman of royal lineage named after Queen Kalama, the wife of King Kauʻikamoea (Kamehameha III). Kalama was a descendant of ʻUmī a ʻUmi through Kamehameha a ʻUmi, ruler of Hawaiʻi Island. Her son, Abraham Kaleimahoe, was born in Lahaina, Maui. Abraham’s biological father was unclear, although he was thought to be the child of Kalama’s first husband. Many people during this time speculated that Abraham’s father might be King David Kalakaua, who was a close companion to Kalama and her family up until his death in 1891. Kalama Kalei Mahoe married her third husband, Peter Fernandez, a Spanish man who came to Hawaiʻi from Bombay, India and adopted all of her children; he was especially fond of Abraham. The family relocated to Kapalama, O‘ahu where Peter Fernandez had a large home and a hardware business. Abraham Kaleimahoe Fernandez returned to Maui to court his friend’s sister, Minerva Eliza Davis, whom he married on December 31, 1877. The Fernandez family was close with the royal family and upon the death of King Kalakaua, Abraham Fernandez was appointed to serve the King of Hawai‘i as a member of Queen Lili‘uokalani’s Privy Council at age 34. As a Privy Council member, he was heavily involved in the affairs of the Mormon LDS church and eventually baptized and confirmed Queen Lili‘uokalani as a member of the Church of Jesus Christ of Latter-day Saints in 1906. Abraham was a known Royalist and supporter of the Queen after the illegal overthrow in 1893. His wife, Minerva, was one of the few people allowed in the Queen’s chambers following her imprisonment in Iolani Palace in 1893. Abraham and Minerva had four daughters and one son, Edwin Kane Fernandez (E.K. Fernandez). King Kalakaua hosted a large lu‘au to celebrate E.K.’s birth in 1883. The Fernandez family remained close companions to the Queen who traveled to Utah with the Fernandez family in order to see E.K Fernandez off to college at BYU in Provo, Utah.

E.K. Fernandez went on to be a famed Native Hawaiian businessman and founded Hawai‘i’s only nationally recognized circus over 115 years ago. In 1903, E.K. founded his company which started as a photo supply business that showed movies on the side. E.K. brought the first English motion picture camera to Hawai‘i and showed the first “talkies” in the islands. He eventually ventured into live entertainment and in 1915, he brought the first circus to Hawai‘i featuring 20 performers and 6 animals. E.K.’s vision of bringing fun and entertainment to Hawai‘i has grown over the years into a multi-generational family business. E.K. married one of the stars in his show, Rose Fernandez, who was a tight-rope walker from California featured in his circus. They had several children and their son, Kane S. Fernandez, eventually took over the family business and transformed the show into the “games-and-rides” entertainment that it offers today. The E.K. Fernandez Show also owns and operates the Fun Factory arcade chain with over 20 outlets in Hawai‘i and throughout America. After his passing in 2001, Kane’s son and E.K.’s grandson, Kanekapukalani Scott Fernandez, took over the family operation. Scott Fernandez was born and raised in Honolulu, Hawai‘i where he continues to live today. Scott has worked at E.K. Fernandez since he was 12-years-old. As a youth he took on summer positions, learning to do everything from estimate costs of goods sold and labor percentages, to traveling throughout the islands performing as a clown. Today, Scott is the President and CEO of E.K. Fernandez Shows. As the current President of the family business, Scott, much like his grandfather and father before him, works to keep the public entertained and to bring families together for fun and thrills. The E.K. Fernandez Show is 117 years old and is the oldest and longest running Native Hawaiian business in Hawai‘i with family roots that go deep into Hawai‘i’s history.

Overview
Scott shared that his family business has run and operated the 50th State Fair at Aloha Stadium for nearly 50 years. Before the 50th State Fair, his grandfather, E.K., hosted the Territorial Fair followed by the 49th State Fair at Kapōlani Park before Hawai‘i became the 50th state, at which point the number was changed. The Fernandez family has hosted community members at the 50th State Fair at Aloha Stadium for decades now and he discussed how this annual event has become a fabric of the community here.

General Discussion
The 50th State Fair is held annually at Aloha Stadium and Scott explained that they always include some cultural performances at the fair including hula and Hawaiian music. The fair also has local nurseries hold plant sales due to Hawai‘i’s agricultural roots. They have also recently started having rodeos at the fair that are put on by a group in Hilo since Hawai‘i has a rich paniolo history. The fair has moved around throughout O‘ahu from Kapōlani Park to Ala Moana Beach Park, then finally the Aloha Stadium. Scott discussed how the fair has become a community tradition over the years and how it is critical that there is always a place to have the fair so that the community can partake in this tradition. Aloha Stadium is particularly accessible for most O‘ahu residents and has the needed flat space to host the entire island. The State Fair covers about 5 acres at Aloha Stadium, including parking.

Biocultural Resources
Scott did not know of any biocultural resources within the project area. He discussed that the State Fair is very much a local tradition in Hawai‘i and is hosted annually at Aloha Stadium. Without the State Fair, E.K. Fernandez would not be able to host any other fair or carnival in Hawai‘i as most of their profits and revenue comes from the 50th State Fair.

Impacts
Scott discussed how the construction of a new Aloha Stadium has the potential to impact the 50th State Fair if there is no longer adequate space to hold the fair where it has been held for nearly 50 years. If the space goes, then the fair goes. He mentioned that the current site at the lower Hālawa parking lot is an ideal location because of the ample parking and unobstructed space, so the rides and fair construction are not hindered by buildings or trees. The flat and open space makes it easy to set up rides and amusements and host the thousands of visitors that come to the fair every year. Scott shared that they require about 3-5 acres of flat and unobstructed land to host the fair. Excess trees and buildings make it difficult to hold space for the fair. Aloha Stadium is a much-needed venue for this community tradition. Scott shared that they have hosted fairs at other locations and they are not as viable at the stadium.

OANA
Mitigation Measures
Scott discussed the immense need for wide open space in order to host a number of community events including marathons, the swap meet, and other entertainment events. He recommended that the new stadium reserves open unobstructed space for large events like the fair. He felt that it would be best if the construction and design of the new stadium considers the need to host the fair annually at this location and avoids negatively impacting the need for this open space resource.

8.2.2 Interview with Olana Margaret Ai
Date of interview: September 30, 2019
Interviewee: Kumu Hula, Olana Ai
Interviewer: Julie Au
Location: Kaluau Drive, ‘Aiea, O’ahu

Biography
Kumu Hula Olana Ai has been teaching hula to those of the ‘Aiea/Hālauwa community for over four decades. Her mother was a Kumu Hula who also taught hula for four decades. Kumu Olana was born in Wahiawa where her mother taught hula her whole life. Kumu Olana has continued her mother’s hula legacy. She explained that her mother named her Olana, which means “living” or as her mother understood it, “eternal life.” When it was time to select a name for her own hālau, Kumu Olana chose Hālau Hula Olana, which means “school of living hula” because she wanted her mother’s hula legacy to live eternally. She started her hālau in 1975. Kumu Olana is married to Howard Ai and together they run Hālau Hula Olana in ‘Aiea. She currently resides in a beautiful home along the water in ‘Aiea, next to Blaisdell Park not far from the Aloha Stadium. She and her husband were blessed to move into the home, which has plenty of space to hold her hula classes there, about seven years ago.

In 2018, Kumu Olana received the Miriam Likelike Keakaluhi Achievement Award during the 43rd Annual Queen Liliuokalani Keiki Hula Competition, and dozens of her former students danced on stage and in the audience in her honor. Her hālau has performed at the stadium for years at the Pro Bowl events, making Hālau Hula Olana a significant part of the Stadium’s history and cultural foundation.

Overview
Kumu Olana lives and breathes hula and has changed and influenced hundreds of lives in the ‘Aiea community through her hālau. She discussed the value of hula as not only a hobby but as a discipline. Kumu Olana teaches that hula is a strict discipline that involves hard work, both physical and intellectual. Hula teaches one to be poised, graceful, strong, and patient. It also teaches them poetry, history, language, and culture. Kumu Olana believes that hula makes a person more hireable, more desirable, and more professional because of the unique skills it provides a person. Kumu Olana discussed how she believes that hula should be better supported within the government in Hawai‘i because of its cultural significance as well as its community benefits. She expressed how hula has so many personal benefits to an individual in the same way we often view team sports as having value, yet hula is not supported in the same way that sports are in Hawai‘i. There are rarely free spaces and venues available for people to teach or take hula, despite how much value the practice has to offer to communities. She believes that hula should have an integral place at the Stadium and should be incorporated into the new Aloha Stadium. She shared her personal history with bringing hula to the Stadium over the years and how significant that has been for her hālau.

General Discussion
Hālau Hula Olana has performed at every single Pro Bowl event at the Aloha Stadium. Kumu Olana discussed how significant it was to have hula performed at an event that hosts people
from all over Hawai‘i and other parts of the world. Kumu Olana showed hundreds of photos of her dancers performing at the Stadium throughout the years during the interview. The photos reveal the time, dedication, commitment, and discipline that goes into taking on such a huge responsibility. She explained that before the hālau started to perform at Pro Bowl events, they performed at the Stadium alongside the Pearl City Marching Band at the invitation of the director, Mr. Nakasone. Kumu Olana commented on how in the past, other kumu have criticized her for having her hālau perform at an event like the Pro Bowl, because it is not culturally significant. Her response to this criticism is that if something big and important to the community is happening in her ahupua‘a, then she has the responsibility to show up with her hālau and remind those present of where they are and what is important to the community hosting them, as well as showing up in Hawaiian clothes and playing Hawaiian music, alongside her trained dancers, in order to show people where they are.

Kumu Olana shared that one year she had 453 dancers perform at the Pro Bowl. She mentioned that her hālau was always well received and that the football players and fans were always taken away at how professional the dancers were and how beautiful their gift of hula was. Having this type of experience at Stadium events is very important to Kumu Olana. She believes that in order for the Stadium to be cognizant of where they are located and the values they should be promoting, hula and mele should be at the forefront of all of their events. Kumu Olana discussed how the Aloha Stadium is unique because at its core, it should be representative of the values of aloha. She explained that the values of aloha belong to Hawai‘i and should be emphasized at a place that uses the word “aloha” in its name. She recommended that the new Stadium should include a house group that is responsible for integrating mele, hula, and values of aloha into all Stadium events. The house group would ideally have a space at the stadium to gather and practice and would perform opening and closing mele at all events that take place there, from sporting events to concerts, in order to ground the audience and visitors in aloha. She discussed certain traditions like opening with Hawai‘i Pono‘i and closing with Hawai‘i Aloha. She also discussed how having hula performed at Stadium events brings history and culture and pride to an arena that has “aloha” right in its title. She believes that if an in-house group was created and given space at the new Stadium to lead events with culturally grounded protocols, the aloha coming out of the Stadium would grow. Having an authentic experience of song, dance, and music to bring to Stadium events, regardless of the event, would be valuable and would help to ground all those who come to visit the Aloha Stadium.

**Biocultural Resources**

Kumu Olana believes that hula is an integral part of Hawaiian culture and has an important role to play in a space like the Stadium. The Aloha Stadium hosts thousands of people at their events and she believes that it is important to include authentic cultural experiences at those events. Kumu Olana has been teaching and practicing hula in the ‘Ewa community for over four decades and feels that part of the responsibility that comes with hula is sharing it. Hula is a cultural resource that should be continued as the new Stadium unfolds.

**Impacts**

Kumu Olana did not express concern about any adverse impacts that the new Stadium may cause.

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**Mitigation Measures**

Kumu Olana stated that if the goal is to make the new Aloha Stadium an authentic Hawaiian place that values aloha, then they have to seek out those in the community who can bring culture to the arena. She believes that it is important that the new Stadium plans consider and include the community and the Hawaiian culture. The Hālawa/Aiea community is made up of mixed cultures and traditions and all of those cultures should be authentically represented at the Stadium in order to express the unique and diverse community that exists in Hawai‘i. Kumu Olana would like to see an in-house hālau given the space to practice and host the stadium guests that come to events. This hālau would extend aloha and give visitors an authentic experience of culture and aloha. She explained that including culture and hula in the future vision of the Stadium would be respectful to the Hawaiian people and would help make the Stadium a Hawaiian place. The new Stadium should be representative of Hawai‘i and aloha. Rather than be a place where people come to drink beer and watch sporting events, she would like to see the Stadium highlight the integrity and the pride of Hawai‘i and its people.
8.2.3 Interview with Kaleo Paik

Date of interview: October 31, 2019
Interviewee: Kaleo Paik
Interviewer: Julie Au
Location: Waimalu, O'ahu

Biography
Kaleo Paik is originally from South Kona, Hawai'i. She works in management and accounting, but has been involved in land and cultural site protection for many years, including the protection of kupuna remains. Ms. Paik has lived in the 'Aiea/Waimalu area for 20 years. She first moved to Pu'ula to attend college at UH Mānoa where she studied music. She was married and lived in Mokulē'ia with her family before moving to Pu'ula where she continues to reside today. She is very knowledgeable about the history of the Pu'ula area that she now calls home.

Overview
Kaleo Paik discussed some of the history connected to the 'Āina surrounding Aloha Stadium and offered comments and suggestions for the development of the proposed entertainment district.

General Discussion
Ms. Paik explained that while it may be easily forgotten today, 'Aiea, Kalāua, Hālawa, and the ahupua'a of 'Ewa are all a part of Pu'ula. Pu'ula is a historically rich place filled with mo'olele and traditions that inform the nature of this place that Ms. Paik calls home. She mentioned the traditions of Kā'ahupahau and Kahi'ukā, the shark guardians of Pu'ula who guard the waters of 'Ewa, from Honolulu to Hālawa. She explained how Pu'ula is also deeply connected to Hawai'i's larger political history, noting that the overthrow of the Hawaiian Kingdom was largely motivated by the acquisition of Pearl Harbor by American military forces. Ms. Paik discussed some of the biocultural resources that still exist in Pu'ula today and how the new entertainment district can take caution not to compromise them, while also honoring them.

Biocultural Resources
Ms. Paik shared that Pu'ula was once an area known for its bounty of resources. Today, Pu'ula hardly resembles what it once was. 'Ewa was once a highly populated moku of O'ahu and produced large amounts of food and fish from its lo'i kalo and loko fa. Ms. Paik commented how these valuable resources, as well as many of Pu'ula's cultural resources have been removed and are highly impacted by continual development. She commented that cultural resources in Pu'ula, including historic sites and kupuna remains, have been negatively impacted throughout history. However, Ms. Paik shared how some of these resources still exist today and discussed that they should be acknowledged and honored. Ms. Paik specifically mentioned Kumu Hula O'lena Ai who comes from a long line of hula practitioners and who continues to give life to Pu'ula through her hālau today. She mentioned the Brown 'ohana, who once owned the entire Waipi'o peninsula until the U.S. military condemned it. The Brown 'ohana received this valuable and important land area from Kamehameha I through their ancestor, John Papa Tī. According to Ms. Paik, these are the voices of cultural significance that still exist today. Ms. Paik discussed the springs that once existed throughout Pu'ula but have been compromised by development. She expressed concern about how the springs we still have today might be compromised by continued development. Ms. Paik mentioned the tradition of the 'āne'i holo (the traveling mullet) who make their way across the island through underground aquifers. According to the mo'olele, the 'āne'i travel all the way to Kālua from the harbors of Pu'ula through underground aquifers that exist throughout O'ahu. Many of these artesian wells exist throughout Pu'ula deep underground. Ms. Paik commented on how the harbors of Pu'ula used to be much more brackish, as many of the streams and wells fed out into the ocean. She discussed how it would be nice if the limu returned to Pu'ula.

Impacts
Ms. Paik discussed how biocultural resources in Pu'ula have been adversely impacted for generations, but many still exist. She recommended that cultural resources, including mo'olele, history, and hula, should inform the development of the new entertainment district. She explained that Pu'ula's cultural resources have been severely compromised, but further damage and harm can be done if the proper steps are not taken with new projects like the Stadium. Ms. Paik expressed concern about how the project might impact the underground aquifers and artesian wells. She cautioned that the development should take extra care not to breach into any of the artesian wells or aquifers of Pu'ula. These wells supply the streams with water and feed the waters of Pu'ula. Developers should be cognizant of any potential impact to this biocultural resource. Development can often cause an aquifer to collapse, causing adverse damage to a valuable natural and cultural resource.

Mitigation Measures
Ms. Paik suggested working closely with cultural practitioners from the area, including O'lena Ai, so the new Stadium project may incorporate culture into their development and design in a way that is meaningful and representative to the Pu'ula communities. Getting input for the design and function of the new Stadium from people who are indigenous to Pu'ula is highly recommended to make sure that the project minimizes negative impacts to the history and traditions of this place. Ms. Paik commented that the Stadium should be more than just a sports arena and that the designers and developers should not overlook this culturally significant area and the opportunity they have to tell its story and share it with the world. Ms. Paik commented that she would like to see a culturally informed theme go into the design of the new Stadium that represents Pu'ula and its history. She mentioned commemorating the sharks of Pu'ula and stated that their significance should be topmost. Including aspects of Hawaiian culture and implementing a Hawaiian thought process in the flow of the district is very important. Ms. Paik discussed including open spaces that capture the natural flow of Pu'ula, including its wind and rains. She encouraged bringing the specific winds and rain of Pu'ula into the conversation and emphasizing their importance in the design and development of the district. She also discussed giving the entertainment district a name that represents Pu'ula and its culture. Ms. Paik highly recommended using caution during the development of this entertainment district. Developers should be careful not to impact any aquifers and she suggests having geologists on site during construction.
8.2.4 Interview with Kehaulani Lum, Kimberly Moa, and Kahale Unciano of Loko Pa`iau

Date of interview: October 16, 2019
Interviewees: Kehaulani Lum, Kimberly Moa, Kahale Unciano
Interviewer: Julie Au
Location: Loko Pa`iau, Kaluaua, O`ahu

Biographies
Aunty Kehaulani Lum is a life-long resident of `Aiea and is the President of the Ali`i Pauahi Hawaiian Civic Club. She is also a member of the `Aiea Community Association (ACA). In the 1990s, the ACA was resurrected and the community came together to speak to the Navy about Loko Pa`iau at McGrew Point and the need to restore it. The Navy responded that they already had a plan in mind for the property and community efforts to restore the loko `ia were originally shut down. Aunty Kehaulani explained that the Ali`i Pauahi Hawaiian Civic Club participated in the very first `Aiea Christmas Parade about 13 years ago and instead of passing out candy, they passed out flyers encouraging the community to restore Loko Pa`iau.

Some time later, Uncle Shad Kane who is also from Pu`uloa met with Aunty Kehaulani about the boundary markers between Kaluaua and `Aiea and told her that the Navy did want to restore the loko `ia, but because the property was designated under Section 106, they needed to partner with a Native Hawaiian organization. That is when the Ali`i Pauahi Civic Club stepped in and took on the Memorandum of Understanding (MOU) with the Navy. The Ali`i Pauahi Hawaiian Civic Club is based in `Aiea, not Kaluaua, but at the time there was no organization in Kaluaua that was ready to take on this task, and so Aunty Kehaulani stepped up to the plate. She explained that Ali`i Pauahi had a large presence in Kaluaua and because the Civic Club honors her, they felt that they had the responsibility to help. The MOU was made official about 5 years ago and Aunty Kehaulani, the Civic Club, and others have been dedicating their time and resources to restore and protect Loko Pa`iau since then.

Kimberly Moa is a resident of Kaluaua and a member of the ACA as well as the Ali`i Pauahi Hawaiian Civic Club. She works for Kualana Lila `Auamo to help serve and protect Hawai`i’s natural and cultural resources, including its fisheries. As a kama`aina of Kaluaua, Kim is recognized as the K`ia`i of Loko Pa`iau.

Kahale Unciano is from Mililani, O`ahu and works for the Living Life Source Foundation in Mānoa. Aunty Kehaulani sits on the Board of Directors for the Living Life Source Foundation, which is how Kahale became involved with Loko Pa`iau and the work being done. Kahale helped direct and lead the group of student and teacher volunteers from Radford High School visiting the pond on the date of the interview, teaching them to lay stone to create an accessible path out to the far end of the pond. Kahale is responsible for helping to erect and maintain the `ahu located on site at the pond and works hard to málama and protect Loko Pa`iau.

Overview
On October 16, 2019, Julie Au, the interviewer, attended a workday at Loko Pa`iau with students and teachers from Radford High School. K`ia`i Kim Moa, Aunty Kehaulani Lum, and Kahale Unciano led the volunteers in leveling the ground and laying a stone path out to the far side of the pond after educating them on the history and traditions connected to this cultural site. After breaking for lunch, the three caretakers sat down for an interview about the development of the new Aloha Stadium and how such a project might impact the communities that they work with as well as the resources that they protect.

General Discussion
Loko Pa`iau is located in the moku of `Ewa, in the ahupua`a of Kaluaua, and in the `ili of Pa`iau. The loko `ia is situated within Keawaluopu`uloa, the many harbored sea of Pu`uloa, which once house upwards of 30 different loko `ia within the `Ewa moku. Today, only 3 loko `ia remain, one of which is Pa`iau. Loko Pa`iau was built about 500 years ago (1500s-1600s) by Mōi wahi`e Kalanimanaua. Kalanimanua was the daughter of Kīkanikoko and came from a family with a royal lineage to O`ahu. She was the first Mōi wahi`e and reigned for 65 years. Her reign was marked as a time of peace, which is attributed to her efforts to keep agricultural and food resources abundant. Kalanimanua lived in Kaluaua and is responsible for building Loko Pa`iau as well as Loko Opun and Loko Pa`akea. These loko `ia were valuable resources that supplied the people with food and sustenance, which kept a time of peace and prosperity on O`ahu. Loko Pa`iau was traditionally fed by water supplied from nearby lo`i kalo. Today, the loko `ia is situated at McGrew Point and has been heavily impacted by development and a loss of natural resources.

The K`ia`i of Loko Pa`iau, Kim Moa, works hard on her personal time alongside other dedicated volunteers and community members to restore and rebuild Loko Pa`iau. After many years, the Navy signed an MOU with the Ali`i Pauahi Hawaiian Civic Club to give them access to Loko Pa`iau to restore and maintain the pond. Aunty Kehaulani and Kim work incredibly hard with the community to restore the beauty created by Kalanimanua and educate those who visit the pond about its history and traditions. After removing the invasive mangrove within the pond, they noticed that the fish started to come back into the pond, as well as the native birds like the ae`o (Hawaiian stilt, Himantopus mexicanus knudseni). They hope to restore the fishpond walls soon, as well as the makahā. Loko Pa`iau once had three makahā. Loko `ia like Pa`iau were once able to feed large populations and provided resources utilized by the entire ahupua`a. Part of the practice they teach at Loko Pa`iau today is that the effort to restore and maintain the pond will take generations, as well as generational knowledge that is passed down and has been lost. In this way, Loko Pa`iau is a space for resources to grow at the hands of a multigenerational community that is learning and growing alongside the pond.

In discussion of the new Aloha Stadium Entertainment District, Aunty Kehaulani commented on the value of a project like the Stadium and how it might be critical to reevaluate its worth before attempting to make it bigger and better. In her opinion, the reason that the Stadium is not successful is that it is too expensive for teams and performers to travel here; rebuilding a new entertainment district will not change this reality. She remarked that no matter what is built, they will not come. Aunty Kehaulani commented on how the Stadium makes more revenue through the swap meet than its sporting or entertainment events. She shared a story that she was told by a man named Gilbert Johnson who grew up in `Aiea and witnessed the original development of the Stadium. Mr. Johnson’s father was the last plantation manager.
in 'Ewa and Aunty Kehau was told that Mr. Johnson represented individuals, many who were Hawaiian, who lived in the Hālawa housing when the Stadium was first being developed. The Stadium authorities held a blessing before construction began and Mr. Johnson was there that day. Reverend Akaka was performing the blessing and the blessing was filmed and featured on the news. Mr. Johnson told Aunty Kehau that when they were starting the blessing, a kahuna wahine (female kahuna) named Kupi'ai dressed in a red kīhe'i walked down the hill from Hālawa and told everyone present to stop. She told them that this was not the place to build the stadium and that they must stop. Reverend Akaka attempted to tell the woman that they were blessing the site to keep everyone safe so that the project could move forward. The woman reiterated that this was not the site to build and to stop, and she was accused of coming to curse them and the project. She explained that she had come to try and protect them from doing something wrong. She eventually left and the blessing as well as the project continued. Aunty Kehau explained that when someone tells you to stop and that this is not the place to do something you should at least stop to listen. She feels that this woman was correct and that the Stadium should not have been built in Hālawa. She asked, "how much has been lost because of the Stadium?" She commented on the revenue lost from failed profit models, the communities displaced in order to develop the stadium, the cultural desecration, and depletion of resources, all for a Stadium that is not successful. Aunty Kehau noted that we should recognize the warning issued from the woman who came down from Hālawa many years ago and pause, reconsider, and correct our actions before quickly jumping into a similar situation with a new stadium project. She explained that she believes that we cannot afford to keep making the same mistakes; that does not mean we have to stop the project, but we need to address and reevaluate the progress being made and the costs at which it comes.

Biocultural Resources

Loko ʻa Paʻaiia is a living biocultural resource. The loko ʻa contains both natural and cultural resources that are actively being restored and maintained by kiaʻi and community members. Aunty Kehau and Kim teach visiting volunteers and community members about the traditions and cultural resources connected to Loko Paʻaiia and the ʻEwa moku before any work starts. They explain to visitors to the pond that one of the guardians of Loko Paʻaiia is the moʻo wahine, Kāneʻakua, and she is also the guardian of Puʻuola. Another guardian of the loko ʻa and Puʻuola is Kaʻahupāhau and her brother Kahʻuka. Kaʻahupāhau is a manō who guards the waters of Puʻuola and protects the people of Oʻahu from man-eating sharks. There is an auh at Loko Paʻaiia dedicated to the guardians of the pond where kiaʻi and caretakers of the pond make offerings of meaʻai (food) and pule (prayer). While at the auh (altar) on the day of the interview, caretaker Kahale UNCiano knelt at the ahu and offered ʻuala to Kaʻahupāhau. As soon as the offering was set upon the ahu, a loud splash occurred along the shore right in front of the ahu. Aunty Kehau explained that this happens almost every time they make an offering to the guardians of the pond. It is perhaps Kaʻahupāhau reminding us that she is still here, protecting her people.

Loko Paʻaiia was once very deep, and since the removal of the invasive mangrove, the pond is starting to fill up again. At its deepest point, it is approximately 8-10 feet. Fish are starting to return to the pond and they hope to be able to reintroduce the native pearl oyster that Puʻuola is famed for to the pond. Aunty Kehau explained that pearl oysters actually help to clean the water as they are natural filters and they hope that reintroducing them to the area will help restore health to the ponds and waters of Puʻuola. After the mangrove removal, which was done without any machinery, the native auh returned to the pond. The birds gather in the shallow parts of the pond and feast for hours in what is now a safe and natural habitat for them. The efforts being taken at Loko Paʻaiia reveal how restoring and protecting significant cultural and natural sites in highly developed places can help to restore thriving ecosystems and communities. Centuries ago, Moʻi Wahine Kālanīmanuia had a rule of peace and prosperity that was attributed to her ability to feed her community and produce valuable resources needed for survival. The merit of her work is mirrored today by Kiaʻi Kim Moa and Aunty Kehaulani Lum who have dedicated their time and bodies to restoring one of Kālanīmanuia’s legacies.

One of the most important resources connected to loko ʻa is fresh water. Kim and Aunty Kehau both discussed how large development projects like the Stadium often divert the natural course of streams and fresh water resources. Covering the earth with cement also has a huge impact on the natural water and the ahupuaʻa’s ability to retain water. The ʻEwa moku is heavily covered with impermeable surfaces and many kūpuna have commented on how this impacts valuable resources like limu. Cutting off water at one source has a trickle down effect to other biocultural resources. When the natural filter is covered up with an impermeable surface, then everything ends up flowing into the ocean and streams. Both Kim and Aunty Kehau recall a time when the streams in ‘Aiea, Kalāua, and Hālawa were once clean. Today, they comment on how they would be hesitant to dip a toe into the streams like Hālawa stream.

Aunty Kehau related this issue with the moʻolelo o ʻEwa hāmā koe (pearl oysters) of ʻEwa. She explained that ‘Ewa was known for its pearl oysters but one tradition teaches that the oysters left ‘Ewa due to greed and a violation of kapu. There was once a girl who was collecting oysters in ‘Ewa when she was not supposed to be and she was caught by the konohiki. The girl was forced to return all of the oysters, but the konohiki did not stop there. He went to her house and demanded a gold coin for payment for her violation. Kāneʻakua, the moʻo kiʻi of Keawaaluaupuʻu, became disgruntled at the greed of the konohiki and the unjust practice he was enforcing, and so she took all of the oysters back to Tahiti. Aunty Kehau explained that there are other ways to interpret this moʻolelo. She discussed how the development of the mauka lands of Puʻuola and the onset of plantations and cattle heavily impacted the resources makai of these operations, including the oysters. It was the greed that came from the development of land and the depletion of resources that drove the oysters away. In this way, we can understand how over development of significant places and resource depletion violates kapu and has repercussions.

Impacts

As ʻEwa and Kahu of Loko Paʻaiia, Kim, Kahale, and Aunty Kehau are very much aware of how development projects impact their community and the natural resources of ‘Aiea, Hālawa, and Kalāua. They expressed concern about water diversion and depletion to facilitate the new Aloha Stadium development projects. In order to maintain sewage and running water for all of the new facilities, more water will be needed to be allocated to this site. This will impact streams and other fresh water resources.
Both Aunty Kehau and Kim discussed the impacts that this project has had historically on the community of Hālāwai. Many people were unjustly displaced for the Stadium to be built. People were removed from their ancestral lands. Homes were condemned. Cemeteries were destroyed and remains were disturbed. The community no longer has lo‘i kalo, lokolo’a, and resources to sustain them. Those who live near the Stadium today are heavily impacted by noise, traffic, and over-development. Kim discussed that many community members question why the new Stadium is being pitched as an entertainment district. To those who call this area home, it is not an entertainment district, but where they live, work, and play. Kim and Aunty Kehau discussed that those designing and developing the new Stadium should be mindful of how this has impacted Hālawa and its people.

Kim and Aunty Kehau also discussed the distribution of wealth. They asked how much revenue would come back to the community or benefit those who live here. Aunty Kehau mentioned that most of the new development will benefit visitors, not the community who is adversely impacted by the project. Kim mentioned that those who actually care for the ‘āina and the community most likely cannot afford a ticket to the new entertainment center.

Mitigation Measures
To mitigate the adverse impacts of the new Stadium project, Aunty Kehau and Kim commented on certain design features. Restoring and maintaining green space to allow water to fill the aquifers and maintain the water lens would be ideal. They discussed how having an open community space, perhaps a green park, would be a good starting point. Children in the Hālawa area often ride their bikes and play in the empty Stadium parking areas. It would be nice to develop a green and open park for the community. Kim mentioned how it is important to consider practice in creating these spaces for community members. What would be the cultural practice of a space like this and how does that benefit the community? She suggested creating a learning space for traditional practitioners and community members to utilize, empowering and educating the community. She mentioned that it would be ideal to plant native and medicinal plants that can be collected and utilized by community members. She recommended that all landscaping includes traditional plants that practitioners can access and utilize like hala, wouke, and kukui. Both Aunty and Kim commented on how the design should be more than ornamental but significant to the place it occupies. How can the design tell the stories of ‘Ewa and represent its people? How can it be reflective of its nature and resources? Kim mentioned that attempting to make the new Stadium sustainable and environmentally conscious, would be ideal.

Aunty Kehau discussed that the design of the new Stadium and other facilities should be mindful of cultural resources like wind and rain. Rather than building something that blocks the traditional winds of Hālawa, how might the design try to invite and utilize those winds? How can the design pay homage to the wind and rains of Hālawa without disrupting them? She also discussed Hālawa and ‘Aiea stream and how they are running dry. How might stream flow be restored in this area? She also suggested that the new facilities should not further disturb the iwi that were displaced by the current Stadium.

Aunty Kehau asked how developers can recognize and honor those who were displaced by the Stadium in the first place. She asked how the new Stadium can honor their legacies and...
8.2.5 Interview with Kimberly Kanoelehua Tiger Mills

Date of interview: December 4, 2019
Interviewee: Kimberly Kanoelehua Tiger Mills
Interviewer: Julie Au
Location: Honolulu, O‘ahu

Biography
Kimberly Kanoelehua Tiger Mills was raised in the ahupua‘a of Kalauao where she has lived for most of her life and she continues to reside there today. Her parents are from Hawai‘i island, namely Hilo and Honokaa. She is currently the Senior Planner at the Office of Conservation and Coastal Lands for the Department of Land and Natural Resources. Ms. Mills also sits on the Board of the ‘Aiea Community Association.

Overview
Ms. Mills expressed excitement in the potential that the New Aloha Stadium Entertainment District has for the ‘Aiea/Hālawa/Kalauao communities. She shared her comments and recommendations for the new development and how it can best serve the local community in Hawai‘i.

General Discussion
Ms. Mills shared that when she was earning her Master’s degree in Urban and Regional Planning her area of focus was Hālawa and ‘Aiea, so she has done a lot of research in that area. She discussed the former Hālawa sugar mill and other plantation features that used to be present in Hālawa and ‘Aiea. Ms. Mills shared that when they first proposed building the Stadium in Hālawa she recalls hearing stories about “spooky things” that might happen should they build at the chosen site. She explained that she was in intermediate school when the Stadium was built, and she could not recall the specific stories, but remembered that there was a certain individual who was upset about the proposed development site. She assumed their anger was due to the fact that the development might disturb housing and burial sites. She added that along with the cemetery in the area, many people used to bury their loved ones at home, either in their yards or under their houses.

Biocultural Resources
Ms. Mills described a loko‘a that used to be located near the Stadium in the East Loch of Pearl Harbor. She said that this fish pond used to delineate the boundaries between the ahupua‘a of ‘Aiea and Hālawa, however, the pond is no longer there. Ms. Mills shared that she has done a lot of studies on the fish ponds located throughout Pearl Harbor, many of which no longer exist.

Ms. Mills discussed the Pearl Harbor Historic Trail and mentioned that it would be nice to connect the Stadium to this trail as a way to increase pedestrian traffic rather than vehicular traffic around the new entertainment district.

Impacts
Ms. Mills expressed concern about overflow from the proposed entertainment district that might impact the surrounding community. These concerns include traffic, congestion, ample parking for tailgating and other local traditions, noise control, and buffer zones between the district and the communities. She discussed that traffic is a big issue and concern and it would be best to prevent traffic from overflowing into the surrounding neighborhoods and negatively impact the community. She expressed that ideally those who live in the area should be able to navigate their way around the stadium easily. She also expressed that the designs should include ample parking in order for people to tailgate. Ms. Mills explained that when there are Kona winds coming through the area, the surrounding community can hear everything going on at the Stadium. Finding ways to buffer noise pollution, perhaps a dome or roof over the new stadium would be ideal. Ms. Mills expressed concern about the new infrastructure and building development. She discussed water and resource availability for the new development and ensuring that people can reside in the area comfortably, especially if more people will be moving to the area.

Mitigation Measures
Ms. Mills recommended finding ways to increase pedestrian access to the stadium in order to avoid vehicular traffic. Working with the city to improve bike and walking paths so that locals can access the stadium and the surrounding area without vehicles would be ideal. She also commented that she would love to see more green space go into the development plans, and discussed that the new entertainment district could potentially be an ideal site for the multi-purpose playground that is currently proposed to be built at Ala Moana Beach Park. She expressed a desire to see spaces created within the district that are “mixed-use” and geared at serving not only visitors but the local communities as well. She also discussed creating building designs that are attractive and not bulky blocks like the Kakako developments. She does not want to see big, blocky, cement structures. Incorporating elements that represent the unique communities of ‘Aiea, Hālawa, and Kalauao would make the development more community-focused and attractive as well.
8.2.6 Interview with John Flores

Date of interview: February 27, 2020
Interviewee: John Flores
Interviewer: Matt Sproat
Location: Via Telephone

Biography
John Flores was born and raised in Hālawa on a property off of Sanjogata Drive, adjacent to the Honolulu Plantation and the Hālawa Camp. His family’s original property has been condemned and covered due to construction of the Aloha Stadium and the roads surrounding the stadium, so Mr. Flores now currently resides in Makakilo.

Overview
Mr. Flores shared his personal history with Hālawa and the area of the current Aloha Stadium site. As a Hālawa resident in his youth, Mr. Flores was able to share the environment and history of the Honolulu Plantation and the adjacent camps for the plantation workers. Mr. Flores provided stories of the daily lives of plantation workers, the cemetery adjacent to their property, the possible heiau near the project area, and a mysterious stone that would return to its original location despite numerous attempts to move it. Mr. Flores recommended that the project have a kahua bless the site before any additional construction due to the sacred nature of Hālawa.

General Discussion
Mr. Flores explained that he resided in a property ¾ of an acre off of Saratoga Drive that was owned by his mother, Annie Moses Flores, and led to Hālawa Stream. The residence was located near the Honolulu Plantation and the sugar fields, and they received free water from the plantation in return for their use of the land for additional sugar fields. Hālawa Camp, specifically the homes for the single Filipino men, was located below the property. The single men lived in a long building with separate apartments and rooms, a patio to congregate, and one kitchen for all to cook. Mr. Flores remarked that the Filipino plantation workers were skilled because the ash and smoke from burning sugarcane did not infiltrate their property.

Kuleana land was a part of Mr. Flores’ mother’s property and this kuleana land was supposed to pass into his mother’s ownership, but it instead passed on to her cousin. Her cousin intended to sign off over to her but passed away before any paperwork was completed, and she decided to purchase the land from her cousin’s son so that she could retain full ownership. The property had various trees and plants that provided sufficient food such as Hawaiian oranges, coconuts, avocado, and more. The family also raised pigs and fowl for consumption. During the depression, Mr. Flores and his family survived off of the food provided by the land, and they had enough to share with his mother’s family when they visited.

Mr. Flores shared a story about the plantation workers who were afraid to walk down a dirt road from the plantation to their homes late at night. If they worked close to midnight, the workers chose to stay at the plantation rather than chance walking down the road. According to accounts, the workers would repeatedly encounter ghosts in or near a koa bush on this dirt road. Mr. Flores also stated that he had personally visited the site of the “haunted” koa bush in his youth.

Mr. Flores also recounted the sacred nature of the area by sharing that his brother had a hex put on him, and a woman from Papakōlea informed his mother that he played with items that he should not have; once the items were destroyed, his brother recovered. Kahuna would frequent the area, although Mr. Flores was unsure of the exact reason for these visits. Hālawa and the area of his residence was said to be sacred by others.

Biocultural Resources
Mr. Flores explained that there once was a cemetery on the family’s property for family members and close family friends; the burials were reinterred at the Hawaiian Memorial Park when the property was condemned by the government. Mr. Flores stated that there were additional unknown burials near the southern property line that were mentioned in the original surveys of the land prior to its condemnation for the Aloha Stadium interchange; this survey mentioned that iwi may be encountered during land excavation, but it did not mention if iwi were ever found or reinterred.

A large stone was adjacent to the cemetery that no one was able to move by hand. Mr. Flores shared a story that construction workers had moved the stone with mach livery, but the stone would continually return to its original location. If the stone is still in this location, it has most likely been buried by the previous construction and excavation in the area; Mr. Flores explained that the location of the stone would be near the off ramp that leads to old Moanalua Road instead of within the project area.

Hālawa Stream was where Mr. Flores learned to swim, along with other children in the Hālawa Camp. Mr. Flores also gathered `ōpae (shrimp) and limu in the brackish water beneath the bridge by Salt Lake Boulevard. This river has since been dredged and cemented, so these biocultural resources are no longer present due to inhospitable water.

Mr. Flores mentioned that University of Hawai’i students investigated the area near the old Moanalua Road and Saratoga Drive to discover the presence of a heiau, but they did not dig deep enough to find it. Sugar planters used to bulldoze rocks and dirt into the area where the heiau was said to be, so Mr. Flores believes that evidence of the heiau was buried deeper than the students investigated. Animal bones were discovered during these investigations. Mr. Flores stated that he would go to the Hālawa Valley quarry for mountain apples, and there were rumors that this area had burials; Mr. Flores’s mother would warn him to leave what they found at the quarry if they saw anything supernatural in the caves, as they do not want to bring anything bad home.

Impacts
Mr. Flores did not know of any resources, traditions, or customs that would be affected by the project, as the project area does not reach his family’s original property.
Mitigation Measures
Mr. Flores shared that in the original blessing for the Aloha Stadium construction, a woman advised against construction at the site because it was sacred and the project would not succeed long-term. He suggested that the site should be blessed once against before construction of the New Aloha Stadium Entertainment District by a kahu due to the sacred nature of Hālawa and the site.

Impact Assessment

9. IMPACT ASSESSMENT

9.1 Impacts to Flora

The biological assessment uncovered the existence of two indigenous species, 'ūhala and milo, within the project area. However, both species are prevalent among the Hawaiian Islands are not of environmental or cultural concern. All of the Polynesian-introduced species – 'ōi, 'ula, and 'ūlu‘ai – are also widespread and not of environmental or cultural concern. Additional impacts to the ecosystem, if applicable, will largely be covered by the biological assessment.

9.2 Impacts to Fauna

There is unlikely to be any impacts to candidate, threatened, or endangered fauna over the course of this project based on the biological assessment. However, the following recommendations were provided to ensure that the species not detected during the survey but have the potential to be in the project area are not highly impacted:

- Prior to removal or trimming, a tree should be inspected by a qualified biologist to determine if White Tern nesting or brooding activity is underway within the tree. If a pair of terns, an egg, or a chick is found, the tree (branch) should be left in place until the chicks fledge and the birds leave the tree, or the nesting attempt fails (Guinther and Luke, 2019:18).
- It is recommended that the lights installed or set-up as part of the construction be shielded to reduce the potential for interactions of nocturnally flying seabirds with external lights and other man-made structures (Guinther and Luke, 2019:19).
- To avoid potential deleterious impacts to roosting bats it is recommended that no woody vegetation taller than 4.6 m (15 ft), be removed between June 1 and September 15, the period in which roosting bats are potentially at risk from vegetation clearing (Guinther and Luke, 2019:20).

9.3 Impacts to Historic Sites

The LRFI did not uncover anything of archaeological note during the pedestrian survey, which assessed the entirety of the project area with GPS data collection (Turran et al., 2020). Historic properties related to "traditional Hawaiian occupation, the rice-cultivation era in the late 1800s, the Honolulu Plantation Company independent homestead program, and World War II" as well as "burials relating to areas of plantation housing" have the potential to be discovered in the project area (Turran et al., 2020:iii). CSH recommends the following for historic preservation:

This LRFI supports the completion of an archaeological inventory survey (AIS) for historic property identification purposes as the next step in the project’s historic preservation review process.
9.4 Impacts to Intangible Cultural Resources

Intangible cultural resources refer to those resources without physical form, such as hula or mele. As there are no known or identified cultural practices currently taking place on the property and the property has been heavily disturbed, it is unlikely the proposed activities would adversely impact intangible cultural resources currently taking place on the property or in adjacent areas. Kumu Hula ‘Olena ‘Ai’s hālau regularly performs at events within Aloha Stadium, but he did not identify any impacts that this proposed project would have on her hālau and practice of hula.

9.5 Impacts to Cultural Practices

Although there are no cultural practices currently taking place within the project area or in its immediate vicinity, construction activities may have a trickle-down effect upon cultural practices in adjoining ahupua‘a. Loko i‘a Pā‘ai‘au is a living biocultural resource that is currently being restored by kū‘ī land community members. Construction has the potential to divert the natural courses of streams and fresh water resources that Loko Pā‘ai‘au relies upon to function effectively. Water may need to be allocated to the entertainment district to maintain sewage and running water to the new facilities. Interviewees Kehaulani Lum and Kimberly Moa recalled that the streams of Aiea, Kakauao, and Hālawa were once clear, but were made unusable by development projects. The proposed project has the potential to affect the restoration efforts at Loko Pā‘ai‘au if fresh water resources are diverted for construction.

9.6 Cumulative and Indirect Impacts

Interviewees identified a plethora of possible cumulative impacts of the proposed project. Scott Fernandez identified the need for wide open spaces like in the current layout of the stadium to hold the sizeable attractions for the annual 50th State Fair. Mr. Fernandez requested that open spaces be present in the entertainment district’s plans, for the fair and additional entertainment venues. The stadium is the only viable option for Mr. Fernandez to hold the fair.

Kaleo Paik identified that artesian wells and aquifers are located underground in Pu‘uola; Ms. Paik informed that the wells supply the streams with water and feed into the bays of Pu‘uola, so any construction and development may cause a collapse of these underground water sources. The plentiful resources of the past in Pu‘uola have been depleted by continued development, so any possible remaining resources should be cherished and acknowledged.

Kimberly Kanoelua Tiger Mills stressed that additional development and creation of the entertainment district will increase traffic, congestion, parking, and noise, which will impact the residents and community.

9.7 Mitigation and Best Management Practices

Kumu Olana ‘Ai and Ms. Paik suggested that cultural practitioners and community members be consulted to ensure that culture is successfully and meaningfully incorporated into the design of the new entertainment district. This development project allows an opportunity for the story of Pu‘uola and the larger ‘Ewa district to be shared with the world; mo‘olelo and traditions such as the sharks of Pu‘uola and the winds and rain of ‘Ewa are examples of such elements that can be incorporated into the design and vision. Kumu Olana recommended a hālau be given ample space to practice and host the stadium guests, which will allow for hula and culture to be represented in the vision. Additionally, Ms. Paik suggested that geologists be on-site during excavation to avoid impacting the aquifers.

Ms. Lum and Ms. Moa recommended that green spaces be incorporated into the new design; this additional will allow aquifers to be filled with water and may alleviate concerns about water diversion to Loko Pā‘ai‘au. Native and medicinal species can be planted in these green spaces and may be collected and utilized by cultural practitioners and community members. Ms. Moa also suggested that traditional plants be used primarily in landscaping for cultural use and that a learning space be created by traditional practitioners and community members to utilize, empowering and educating the community. In addition to green spaces, open parks should be developed for the community and children to access. If possible, Ms. Lum requested that stream flow be restored to the area with an effort to maintain water availability.

During construction of the original stadium, many residents and burials were condemned and displaced to allow for ample space. Ms. Lum suggested that the new entertainment district honor those displaced by the original construction in a thoughtful manner, to acknowledge their sacrifice and pain. Ms. Lum also requested that any additional li not be disturbed with new construction efforts.

To alleviate increased vehicular traffic, Ms. Mills suggested an increase in pedestrian access to the entertainment district; Ms. Mills recommended that the stadium should connect to the Pearl Harbor Historic Trail for increased bicycle and pedestrian use. Ms. Mill also suggested that the project collaborate with the City to improve the bike and walking paths surrounding the stadium. The noise pollution within the stadium itself may be alleviated with the incorporation of a dome design. Ms. Mills also shared that the design should include ample parking that will allow tailgating to continue.

John Flores shared that Hālawa is a sacred place with a storied history. A woman advised against construction of the original Aloha Stadium due to this sacred nature. Mr. Flores suggested that a kāhu bless the site before any new construction to ensure its success.
10. CONCLUSION

Based on the guidelines set forth in *Ka Pa’alai*, the Hawai’i Supreme Court provided government agencies an analytical framework to ensure the protection and preservation of traditional and customary Native Hawaiian rights while reasonably accommodating competing private development interests. This is accomplished through:

1) The identification of valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area.

2) The extent to which those resources—including traditional and customary Native Hawaiian rights—will be affected or impaired by the proposed action; and

3) The feasible action, if any, to be taken to reasonably protect Native Hawaiian rights if they are found to exist.

In order to complete a thorough CIA that complies with statutory and case law, it is necessary to consult with Native Hawaiian cultural practitioners and lineal and cultural descendants from the project area and have meaningful dialogues with them that result in data that speaks to the intent of building a strong cultural impact analysis. From thorough interviews and research, data was extrapolated that provides an unprecedented comprehensive look at the previous cultural resources on this ‘āina.

This assessment thoroughly identified valued cultural, historical, and natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are exercised in the project area, and found that while there are no resources in the direct project area, there are resources in the larger geographic extent. If the mitigation measures presented by the interviews are considered, the project should have no deleterious effects upon cultural practices such as the restoration of Loko Pa’alai nor resources such as aquifers, natural water flow, and ʻIo. It is the recommendation of Honua Consulting to consult with the community and cultural practitioners of the area to allow the New Aloha Stadium Entertainment District’s design to be meaningful to those who reside in the ahupua’a and larger ʻEwa moku.

References


Alexander, W.D. 1891 *A Brief History of Land Titles in the Hawaiian Kingdom.* In Thrum’s *Hawaiian Almanac and Annual for 1891*, Honolulu, Hawai`i.


Apple, R.A. 1974 *National Register of Historic Places Inventory – Nomination Form for Pearl Harbor or U.S. Naval Base, Pearl Harbor; Pearl Lochs, Pearl River; Pa’u-loa*. United States Department of the Interior, Honolulu, Hawai`i.


References


Boundary Commission Testimonies 1864-1920  Digitized collection from Microfilms of the Hawai‘i State Archives (Kumu Pono Associates LLC).


References

The Daily Bulletin


Emerson, J.S. 1892  The Lesser Hawaiian Gods. Hawaiian Historic Society, Honolulu, Hawai‘i.

Evening Bulletin
1898a  “Honolulu Sugar Company; Its Plantation Will Extend from Pearl City to Halawa; Incorporation at San Francisco was Noted in Bulletin of Saturday – Area, Elevation and Soil.” Evening Bulletin, Jun. 8, 1898.

The Evening Bulletin Industrial Edition

References

Fornander, A. (compiler)  
1916  "He Kaua no Pikoiakaalua."  Fornander Collection of Hawaiian Antiquities and Folk-lore, The Hawaiians' Account of the Formation of their Islands and Origin of their Race, with the Traditions of Their Migrations, etc., as Gathered from Original Sources, vol. IV.  Bishop Museum Press, Honolulu, Hawai‘i.

Guinther, E.B., and Luke, B.  
2019  Natural resources assessment for the Aloha Stadium site (TMKs 9-9-003: 055, 061, 069, 060, & 071) Halawa, Honolulu District, Island of O‘ahu.  AECOS Inc., Kāne‘ohe, Hawai‘i.

Haalelea, L. (K. Maly, translator)  
1858  "O‘elohoolaha."  Ka Hae Hawaii.

Hall, E.O.  

Handy, E.S.C., Handy, E.G., with Pukui, M.K.  

Harney, T.J.  

The Hawaiian Gazette  
1873  "On Foot Around Oahu."  The Hawaiian Gazette, Aug. 13, 1873.

1874a  "Address of the Planters to the Legislature."  The Hawaiian Gazette, May 27, 1874.

1874b  "The Royal Progress Through the Hawaiian Kingdom."  The Hawaiian Gazette, Apr. 29, 1874.


1889  "What the Samoan Disaster May Do For Pearl Harbor."  The Hawaiian Gazette, Apr. 16, 1889.

References

1890a  "Notice of Intention to Take Land; To All Whom It May Concern."  The Hawaiian Gazette, Feb. 11, 1890.

1890b  "The Arion Excursion; It Was a Grand Success Throughout – Between Five and Six Hundred People in Attendance."  The Hawaiian Gazette, May 13, 1890.

1900  "Pearl Harbor – Text of Bill for Making a Naval Station."  The Hawaiian Gazette, May 29, 1900.


1908b  "The Measure Passes Through Congress and Now Awaits the Signature of the President – Involves Great Outlay."  The Hawaiian Gazette, May 15, 1908.


The Hawaiian Star  
1895  "Ewa Census – A Summary of the Work is Now Completed."  The Hawaiian Star, Oct. 9, 1895.

1897  "The Proposed Cemetery – God’s Acre To Be Placed at Aiea. The Oahu Railway Company Make a Proposition to the Board of Health – Details of the Plan."  The Hawaiian Star, Apr. 22, 1897.

1898  "With American Capital – Big Plantation On This Island Planned."  The Hawaiian Star, Apr. 1, 1898.


1899b  "For New Road."  The Hawaiian Star, Jan. 24, 1899.

1899c  "Halawa to be Selected – Mr. Smith’s Cemetery Site is Approved."  The Hawaiian Star, Feb. 2, 1899.
References


1903  "Valuation of Aiea — Was Discussed in Connection with Acquisition of a federal Building Site Last January. The estimate of $45,000 was Formally Agreed to Then Says Superintendent Cooper." The Hawaiian Star (1st ed.), Nov. 11, 1903.


Henke, L.A.

Hiroa, T.R.

Home Rula Repubalika (K. Maly, translator)
1902  "He Moolelo Kao o Kau." Home Rula Repubalika, Jan. 6, 1902 – Mar. 15, 1902.

The Honolulu Republican
1901  "Plantation will Profit - Naval Works to Prove Benefit. Judge and Jury Plan Visit to Pearl Harbor on Monday Next – Captain Merry and Manager Low Will Point Out Lands in Question – A "Full" Lunch to be Provided – Captain Pond on Witness Stand – Testified Benefits to Property." The Honolulu Republican, Dec. 28, 1901.

Honolulu Star Bulletin
1914  "Contractors’ Loss May Be Much Reduced. Rumor Current That Specifications on Pearl Harbor Drydock Will Be Modified – Change Would Mean Division of


Hualea, A.H.K.
1866  "Make i Aloha nuia." Ka Nupepa Kuokoa, Jun. 9, 1866.

Tj, J.P. (M.K. Pukui, translator)

The Independent
1895  "An Essay on Acquisition of Pearl Harbor; The history of its acquisition. Its location, appearance, and other characteristics. An unorthodox view by a student." The Independent, May 8 – May 13, 1895.

Islam, K.

Jarves, J.J.

Jordan, D. and Evermann, B.

Ka Lahui Hawaii (K. Maly, translator)
1877  "Na Anoai" Ka Lahui Hawaii, May 3, 1877.

Ka Loea Kalaaina

Ka Hae Hawaii (K. Maly, translator)
1895  "He Kaapuni." Ka Hae Hawaii, Apr. 13, 1895.

Ka Hoku o Hawaii (K. Maly, translator)

Ka Nupepa Kuokoa (K. Maly, translator)
1864  "He inoa no KeKalamaHaleo." Ka Nupepa Kuokoa, Jun. 4, 1864.

DRAFT Cultural Impact Assessment Report for the New Aloha Stadium Entertainment District
Hālawa and ‘Aiea Wai‘ana‘a, ‘Ewa District, ʻOahu Island

References
McAllister, J.G.

McDonald, M.A.

McDonald, M.A., and Weissich, P.R.

Meyen, Dr. F.J.F.
1981 A Botanist’s Visit to Oahu in 1831. Translated by Astrid Jackson, Edited by Mary Anne Pultz. Press Pacifica, Ltd.

Nakuina, M.K. (K. Maly, translator)
1901 “Moolelo Hawaii o Pakaa a me Ku-a-Pakaa na Kahu Iwikuamu o Keawenuiaumi Ke Alii o Hawaii, a o na Moopuna hoi a Laamaomao!” Ke Aloha Aina.

Napoka, N.
1994 Determination of Historic Significance of Pohaku O Kii State Site No. 50-88-09-489: A Traditional Cultural Property of Nalopaka Place, Aiea, Ewa, Oahu.

NAVFAC (Naval Facilities Engineering Command)
2016 Fact Sheet: Loko Pa’aiau Fishpond, McGrew Point Housing, Oahu, Hawaii.

Nogelmeier, M.P.

The Pacific Commercial Advertiser
1861 “Rice Culture.” The Pacific Commercial Advertiser, Jul. 11, 1861.
1868 “Our Island Correspondence – Kaala Mountains, January, 1868.” The Pacific Commercial Advertiser, Jan. 18, 1868.

The Pacific Commercial Advertiser
1873a “Annexation – No. 7.” The Pacific Commercial Advertiser, Apr. 12, 1873.
1873b “Cutting Affray at Halawa.” The Pacific Commercial Advertiser, Jan. 25, 1873.
1890a “Friday: August 1, 1890.” The Pacific Commercial Advertiser, Aug. 1, 1890.
1890c “Oahu Railway and Land Co.’s Time Table.” The Pacific Commercial Advertiser, Aug. 1, 1890.
1892a “Administrator’s Sale.” The Pacific Commercial Advertiser, Feb. 29, 1892.
1892c “Notice.” The Pacific Commercial Advertiser, Aug. 8, 1892.
1893a “In the Supreme Court of the Hawaiian Islands.” The Pacific Commercial Advertiser, Nov. 3, 1893.
1895a “Affairs at Pearl City – Trains Will Be Allowed To Go To Halawa Only.” The Pacific Commercial Advertiser, Sep. 11, 1895.
1895c “How Fish Come In.” The Pacific Commercial Advertiser, Nov. 8, 1895.
1895d “Pearl City Objects to Trains.” The Pacific Commercial Advertiser, Sep. 10, 1895.


1900d  “Destruction In The Big Storm; Honolulu Plantation Engineer May Have Been Drowned – Minute Gaps Heard Off Pearl Harbor May Mean Ship on Reef; Rain Swells the Streams and the City is Flooded in Many Districts Causing Heavy Losses to Owners.” *The Pacific Commercial Advertiser*, Oct. 17, 1900.


1900f  “Naone’s Body Found; Plantation Engineer was Drowned in Pump Pit at Aiea.” *The Pacific Commercial Advertiser*, Oct. 22, 1900.


1901b  “Land Fight is Now On – Pearl Harbor Site Suit Summons Served. Lessees As Well As Owners In It – Hahawa, Kuhuua and Ford’s Islands the Bone of Contention.” *The Pacific Commercial Advertiser*, Jul. 17, 1901.


The Polynesian
1847 "Notice: James Robinson & Co." The Polynesian, Apr. 17, 1847.
1858 "Roads on Oahu." The Polynesian, Jun. 20, 1858.
1860 "Specimen of Popular Hawaiian Literature." The Polynesian, Apr. 14, 1860

Pukui, M.K.

Pukui, M.K., and Elbert, S.H.

Reference Maps
1873 Map of West Loch and the Peninsula of Pearl River. Register Map No. 322. J. Udgate.
1873 Preliminary Sketch Showing the Coast Line of the Pearl Lochs, Oahu Hawaiian Islands, From Papers of the Hawaiian Govt. Survey. Library of Congress Chart No. 1800 CT003211. W.D. Alexander.
1874 Aiea, Ewa, Oahu. Register Map No. 323. C.J. Lyons.
1894 Pearl Harbor and Ewa Register Map No. 1739. S.M. Kanakanui.
1898 Portion of Aiea, Ewa, Oahu. Register Map No. 1944. M.D. Monserrat.

Sterling, E., and Summers, C.

Thruph, E.N.

Thrum, T.

State of Hawai`i
Ms. Files cited in text from the collections of the:
Bureau of Conveyances
Department of Land and Natural Resources — Land Division
Department of Land and Natural Resources — State Survey Division
Hawai`i State Archives

Books
References


Whitney, H.M. 1890 The Tourist’s Guide Through the Hawaiian Islands Descriptive of Their Scenes and Scenery. The Hawaiian Gazette Company’s Press, Honolulu, Hawai‘i.


Appendix A: Diagrams of the Three Master Plan Options
Appendix B: Example of Development Phasing with Option B

[reserve for phase 1A.1 diagram]

[reserve for phase 1A.2 diagram]
[reserve for phase 1A.3 diagram]
APPENDIX C: GLOSSARY OF HAWAIIAN TERMS

The following list of terms were used frequently throughout this report. All definitions were compiled using Pukui and Elbert’s *Hawaiian Dictionary* (1986).

**Ahu**
Heap, pile, collection, mount, mass; altar, shrine, cairn; a traplike stone enclosure made by fishermen for fish to enter; lails, as the earth oven.

**Áhau**
To swell, as a wave; heap, mound, hillside, knoll, pile.

**Ahupua’a**
Land division usually extending from the uplands to the sea, so called because the boundary was marked by a heap (ahu) of stones surmounted by an image of a pig (pu’a’a), or because a pig or other tribute was laid on the altar as tax to the chief.

**Á‘ina**
Land, earth.

**Ákua**

**Ála**
Path, road, trail.

**Ála hele**
Pathway, route, road, way to go, itinerary, trail, highway, means of transportation.

**Ála loa**
Highway, main road, belt road around an island, a long road.

**Ála pí’i**
Stairs, steps, ladder, stile, doorstep, ascent, scali (musical).

**Áli’i**
1. Chief, chiefess, ruler, monarch. 2. Royal, regal. 3. To act as chief, reign.

**Áumakua**
Family or personal gods, deified ancestors who might assume the shape of sharks, owls, hawks, dogs, plants, etc. A symbiotic relationship existed; mortals did not harm or eat them, and the ‘umakua warned or reprimanded mortals in dreams, visions, and calls.

**Áumakua**
Plural of ‘umakua.

**Áupuni**
Government, kingdom, dominion, nation, people under a ruler; national.

**Áuwai**
Irrigation ditch, canal.

**Áwalau**
Port, harbor, cove, channel or passage, as through a reef. Ka awalu o Pu’u-loa, the many channels (or lochs) of Pearl Harbor.

**Hála**
1. Long house, as for canoes or hula instruction; meeting house. 2. Large, numerous; much.

**Hale**
House, building, institution, lodge, station, hall; to have a house.

**Heiau**
Pre-Christian place of worship, shrine. Some heiaus were elaborately constructed stone platforms, other simple earth terraces.

**Heiau waihau**
Heiau specifically for mo’o spirits.

**Hēlu**
To count, number, compute.

**Ho’á‘ina**
Tenant, caretaker, as on a kuleana.

**Hō‘alona**
Sign, symbol, representation, insignia, emblem, mark, badge, signal, omen, portent, target, credential, token of recognition, a lot that is cast.

**Hula**
A Polynesian dance form accompanied by chant or song.

**Hil**
Land section, next in importance to ahupua’a and usually a subdivision of an ahupua’a.

**Illina**
Grave, tomb, sepulcher, cemetery, mausoleum, plot in a cemetery.

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**Tili kūpono**
A nearly independent ‘ili land division within an ahupua’a, paying tribute to the ruling chief and not to the chief of the ahupua’a. Transfer of the ahupua’a from one chief to another did not include the ‘ili kūpono located within its boundaries.

**İna ‘aina**
Place name.

**Ivi**
Bone, carcass (as of a chicken). The bones of the dead, considered the most cherished possession, were hidden, and hence there are many figurative expressions with ivi meaning life, old age.

**Kahawai**
Stream, creek, river; valley, ravine, gulch, weather wet or dry.

**Kahuna**
Priest, sorcerer, magician, wizard, minister, expert in any profession (whether male or female).

**Kai**
Sea, sea water; area near the sea, seaside, lowlands; tide, current in the sea.

**Kalana**
Division of land smaller than a moku or district, county.

**Kalo**
Taro (*Colocasia esculenta*), a kind of aroid cultivated since ancient times for food, spreading widely from the tropics of the Old World. In Hawai‘i, kalo has been a staple from earliest times to the present, and here its culture developed greatly, including more than 300 forms. All parts of the plant are eaten, its starchy root principally as poi, and its leaves as lū‘au. It is a perennial herb consisting of a cluster of long-stemmed, heart-shaped leaves rising 30 cm. or more from underground tubers or corms.

**Kama‘aina**
Native-born, one born in a place, host.

**Kanaka**
Human being, man, person, individual, party, mankind, population.

**Kānaka**
Plural of kanaka.

**Kānawai**
Law, rule, statute, act, regulation, ordinance, decree, edict; legal to obey a law; to be prohibited; to learn from experience.

**Kāne**
Male, husband, male sweetheart, man; brother-in-law of a woman.

**Kanikau**
1. Dirge, lamentation, chant of mourning, lament. 2. To chant, wail, mourn.

**Kapa**
Tapa, as made from wauke or mānami bark; formerly clothes of any kind of hibiscus clothes.

**Kapu**
1. Taboo, prohibition. 2. Special privilege or exemption from ordinary taboos. 3. Sacredness, prohibited, sacred, holy, consecrated. 4. No trespassing, keep out.

**Ki’i**
Guard, watchman, caretaker; to watch, guard, picket; to overlook, as a bluff.

**Khāpāi**
1. Small land division, smaller than a paukū. 2. Cultivated patch, garden, orchard, field, small farm.

**Kil**
1. A small gourd or coconut shell, usually cut lengthwise, as used for storing small, choice objects, or to feed favorite children from. 2. Used also as a quotient in the kilu game: the player chanted as he toss the kilu towards an object placed in front of one of the opposite sex; if he hit the goal he claimed a kiss. 3. To play this game.

**Kino lau**
Many forms taken by a supernatural body, as Pele, who could at will become a flame of fire, a young girl, or an old hag.
**Appendix C: Glossary of Hawaiian Terms**

**Hō‘oua**

<table>
<thead>
<tr>
<th>Ko‘a</th>
<th>Coral, coral head.</th>
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</thead>
<tbody>
<tr>
<td>Kōʻele</td>
<td>Small land unit farmed by a tenant for the chief.</td>
</tr>
<tr>
<td>Ko’i</td>
<td>1. Axe, adze. 2. Adze-like, sharp, projecting as a forehead.</td>
</tr>
<tr>
<td>Konohiki</td>
<td>1. Headman of an ahupua’a land division under the chief. 2. Land or fishing rights under control of the konohiki; such right are sometimes called konohiki rights.</td>
</tr>
<tr>
<td>Kuapo</td>
<td>1. Belt; to put on a belt. 2. To swap, exchange, trade.</td>
</tr>
<tr>
<td>Kula</td>
<td>1. Plain, field, open country, pasture. An act of 1884 distinguished dry or kula land from wet or taro land. 2. Source; container. 3. Basket-like fish trap. 4. School, academy; to teach school, go to school; to hold school or class sessions.</td>
</tr>
<tr>
<td>Kuleana</td>
<td>Right, privilege, concern, responsibility, title, business, property, estate, portion, jurisdiction, authority, liability, interest, claim, ownership, tenure, affair, province.</td>
</tr>
<tr>
<td>Kumu</td>
<td>1. Bottom, base, foundation, basis, title (as to land), main stalk of a tree, trunk, handle, root (in arithmetic); basic, hereditary, fundamental. 2. Teacher, tutor, manual, primer, model, pattern. 3. Beginning, source, origin; starting point of planting. 4. Reason, cause, goal, justification, motive, grounds, purpose, object, why. 5. An article bought, sold or exchanged; price. 6. Herd, flock. 7. Tenon, socket.</td>
</tr>
<tr>
<td>Kūpālu manō</td>
<td>To chum sharks; shark bait; said also a human taboo breakers thrown into the sea.</td>
</tr>
<tr>
<td>Kupapa‘u</td>
<td>Corpse, cadaver, dead body, carcass.</td>
</tr>
<tr>
<td>Kupuna</td>
<td>Grandparent, ancestor, relative or close friend of the grandparent’s generation, grandaunt, granduncle.</td>
</tr>
<tr>
<td>Kūpuna</td>
<td>Plural of kupuna.</td>
</tr>
<tr>
<td>Lei</td>
<td>Garland, wreath; necklace of flowers, leaves, shells, ivory, feathers, or paper, given as a symbol of affection.</td>
</tr>
<tr>
<td>Leinaa ka’uhaʻane</td>
<td>Place where spirits leaped into the nether world; lit. leap of the soul.</td>
</tr>
<tr>
<td>Lele</td>
<td>To fly, jump, leap, hop, skip, swing, bounce, burst forth.</td>
</tr>
<tr>
<td>Limu</td>
<td>A general name for all kinds of plants living under water, both fresh and salt, also algae growing in any damp place in the air, as on the ground, on rocks, and on other plants; also mosses, liverworts, lichens.</td>
</tr>
<tr>
<td>Loʻi</td>
<td>Irrigated terrace, especially for taro, but also for rice and paddies.</td>
</tr>
<tr>
<td>Loko i’a</td>
<td>Traditional Hawaiian fishpond.</td>
</tr>
<tr>
<td>Mākāhā</td>
<td>Ancient Hawaiian game suggesting bowling; the stone used in the game; shot, shot-put.</td>
</tr>
<tr>
<td>Makahiki</td>
<td>1. Year, age; annual, yearly. 2. Ancient festival beginning about the middle of October and lasting about four months, with sports and religious festivities and tattoo on war.</td>
</tr>
<tr>
<td>Makai</td>
<td>On the seashore, toward the sea, in the direction of the sea.</td>
</tr>
<tr>
<td>Makena</td>
<td>Mourning, wailing, lamentation; to wall, lament, weep for joy.</td>
</tr>
<tr>
<td>Mālama</td>
<td>To take care of, tend, attend, care for, preserve, protect, beware, save, maintain.</td>
</tr>
</tbody>
</table>

**Hō‘oua**

<table>
<thead>
<tr>
<th>Manō</th>
<th>Shark (general name).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manō ʻi’a</td>
<td>Ordinary shark.</td>
</tr>
<tr>
<td>Manō kānaka</td>
<td>Shark thought to be born of a human mother and sired by a shark god, or by a defiled person whose spirit possesses a shark or turns into a shark.</td>
</tr>
<tr>
<td>Mauka</td>
<td>Inland, upland, towards the mountain.</td>
</tr>
<tr>
<td>Mea ‘ai</td>
<td>Food, refreshment; groceries.</td>
</tr>
<tr>
<td>Mele</td>
<td>1. Song, anthem, or chant of any kind. 2. Poem, poetry. 3. To sing, chant.</td>
</tr>
<tr>
<td>Mele inoa</td>
<td>Name chant, i.e., chant composed in honor of a person, as of a chief.</td>
</tr>
<tr>
<td>Mele pana</td>
<td>Chant of a storied place.</td>
</tr>
<tr>
<td>Mō‘i</td>
<td>King, sovereign, monarch, majesty, ruler, queen.</td>
</tr>
<tr>
<td>Moku</td>
<td>1. District, island, islet, section, forest, grove, clump, fragment. 2. To be cut, severed, amputated, broken in two.</td>
</tr>
<tr>
<td>Mokupuni</td>
<td>Island.</td>
</tr>
<tr>
<td>Moʻo</td>
<td>Lizard, reptile of any kind, dragon, serpent.</td>
</tr>
<tr>
<td>Moʻoʻi‘ina</td>
<td>Land parcel; narrow strip of land, smaller than an ʻili.</td>
</tr>
<tr>
<td>Moʻolelo</td>
<td>Story, tale, myth, history, tradition, literature, legend, journal, log, yard, fable, essay, chronicle, record, article.</td>
</tr>
<tr>
<td>Moʻowahine</td>
<td>Female lizard deity.</td>
</tr>
<tr>
<td>Mulihai</td>
<td>River, river mouth; pool near mouth of a stream, as behind a sand bar, enlarged by ocean water left there by a high tide; estuary.</td>
</tr>
<tr>
<td>‘Ohana</td>
<td>Family, relative, kin group; related.</td>
</tr>
<tr>
<td>Oʻiʻina</td>
<td>Resting place for travelers, such as a shady tree, rock; to rest.</td>
</tr>
<tr>
<td>Oʻolelo noʻeau</td>
<td>Proverb, wise saying, traditional saying.</td>
</tr>
<tr>
<td>Oli</td>
<td>Chant that was not danced to, especially with prolonged phrases chanted in one breath, often with a trill at the end of each phrase; to chant thus.</td>
</tr>
<tr>
<td>Pā</td>
<td>Fence, wall, corral, pen, sty, enclosure, courtyard, patio, arena, (house) lot, yard, extremity.</td>
</tr>
<tr>
<td>Pae ʻīna</td>
<td>Group of islands, archipelago.</td>
</tr>
<tr>
<td>Pīpī</td>
<td>Hawaiian pearl-oyster.</td>
</tr>
<tr>
<td>Pōʻalima</td>
<td>1. Friday, 5th, fifth day. 2. Work on the chief’s plantations, so called because this work was done on Fridays; the chief’s plantation where the people worked on Fridays.</td>
</tr>
<tr>
<td>Poʻe</td>
<td>People, persons, personnel, population, assemblage, group of, company.</td>
</tr>
<tr>
<td>Poʻe ʻalawaʻa</td>
<td>Fisher-people.</td>
</tr>
<tr>
<td>Poʻe mahiʻai</td>
<td>Agriculturalists.</td>
</tr>
<tr>
<td>Pueo</td>
<td>Hawaiian short-eared owl (Asio flammeus sandwichensis), regarded often as a benevolent ʻauamua.</td>
</tr>
<tr>
<td>Puhi</td>
<td>Eel.</td>
</tr>
<tr>
<td>Pule</td>
<td>Prayer, magic spell, incantation, blessing, grace, church service, church. To pray, worship, say grace, as a blessing, cast a spell.</td>
</tr>
<tr>
<td>Puʻuone</td>
<td>Sand dune of heap.</td>
</tr>
<tr>
<td>Umeke lāʻau</td>
<td>Wooden bowl.</td>
</tr>
</tbody>
</table>
### Appendix C: Glossary of Hawaiian Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>'Ūniki</td>
<td>Graduation exercises, as for hula, lua fighting, and other ancient arts (probably related to nīki, to tie, as the knowledge was bound to the student).</td>
</tr>
<tr>
<td>Uwē helu</td>
<td>A wailing call of grief and love, recounting deeds of a loved one and shared experiences; to weep and speak thus.</td>
</tr>
<tr>
<td>Wahipana</td>
<td>A sacred and celebrated/legendary place.</td>
</tr>
<tr>
<td>Wahine</td>
<td>Woman, lady, wife; sister-in-law, female cousin-in-law of a man.</td>
</tr>
<tr>
<td>Wai</td>
<td>Water, liquid or liquor of any kind other than sea water.</td>
</tr>
<tr>
<td>Wao</td>
<td>1. Realm. 2. A general term for inland region usually forested but not precipitous and often uninhabited.</td>
</tr>
</tbody>
</table>
Appendix E-2:
Public Engagement /
Scoping Summary
Executive Summary

Public outreach and consultation are important components of the EIS and master planning processes. Therefore, meetings were held with community groups and key stakeholders about the proposed New Aloha Stadium Entertainment District (NASED). Community groups were consulted and asked to provide their feedback throughout the process. Likewise, input was solicited from key stakeholders representing business, entertainment, government, military, sports, television, tourism, and other industries. Through outreach and consultation with these groups, informed decisions were made during the planning process that addresses the community’s needs, as well as those of numerous stakeholders.

Recognizing extensive work completed by the City and County of Honolulu and community during the Hālawa Transit Oriented Development (TOD) plan, which was carefully reviewed and considered throughout the entirety of this project, this community engagement plan is in many critical ways a continuation of the TOD outreach and community engagement effort and looked to build upon the many important successes of that planning process.

Between September 2019 and March 2020, when public meetings were suspended due to the coronavirus disease 2019 (COVID-19) pandemic and resulting emergency orders by the State of Hawaii and City of County of Honolulu, the project team regularly engaged in a robust and comprehensive community engagement program that aimed to build a strong, valued relationship with area stakeholders, stadium users, and the public.

These efforts helped to support maximum transparency and solicitation of input into the Environmental Impact Statement Public Notice (EISPN) scoping process and master planning design process. These relationships and the resulting input were extensively considered throughout the production of the Draft EIS and conceptual master plan. It also influenced numerous aspects of these documents, including the design of the master plan.

TABLE OF CONTENTS

EXECUTIVE SUMMARY 3

BACKGROUND 6
Introduction 6
Project Description 6
Draft Environmental Impact Statement Requirements 7

PUBLIC SCOPING AND COMMUNITY ENGAGEMENT FOR THE EISPN 11
Notice to federal, state, and county agencies 11
Public Notices 13
Community and Stakeholder Engagement 15
Publication of the EISPN and Notice as to Availability 15
Pre-Consultation with Community Groups and Stakeholders 17
Media Coverage 17
Public and Community Notices for the Scoping Meeting 21
Extension of Scoping Period Deadline 21
EISPN Scoping Meeting
Scoping Meeting Format 24 25
Oral Comments Received at the Public Scoping Meeting 25
Written Comments Received in Response to the EISPN 28
Reporting Results to the Community 32
Publication in Ko Wai Olo 33

PUBLIC OUTREACH AND CONSULTATION FOR THE MASTER PLANNING PROCESS34
Ongoing Public Engagement 34
Community Design Workshops
  Goals of Workshops 37
  Room Layout 38
Background

Introduction

Public outreach and consultation are important components of any environmental impact statement (EIS) and master planning process. Therefore, it is critical from the outset of any project to initiate early and open discussion with interested persons and agencies concerning the environmental impacts of proposed a proposed action. This document details the plan for such public outreach and consultation for the EIS and Master Plan for the New Aloha Stadium Entertainment District (NASED). This document also reports on the outcomes of the public outreach and consultation associated with the EIS and master planning process.

It should be noted that this process built upon the extensive work completed by the City and County of Honolulu and community during the Hālawa Transit Oriented Development (TOD) plan, which was carefully reviewed and considered throughout the entirety of this project. The community engagement plan is in many critical ways a continuation of the TOD outreach and community engagement effort and looked to build upon the many important successes of that planning process.

Project Description

The Proposed Action, in response to the findings of the February 2017 Aloha Stadium Conceptual Redevelopment Report, will encompass the construction of a new stadium facility in addition to related ancillary development that will serve to create a New Aloha Stadium Entertainment District on the grounds of the existing Aloha Stadium site in Hālawa.

Under the provisions of Act 172, SLH 2012, the State of Hawaii Department of Accounting and General Services (DAGS) has determined at the outset that an environmental impact statement is required for their proposed “New Aloha Stadium Entertainment District” (NASED) as being implemented under their Planning for New Stadium and Site Redevelopment project, DAGS Job No. 12-10-0862. An Programmatic
EIS is being prepared for the proposed NASED, situated at TMK: (1) 9-9-003:061 and neighboring TMK: (1) 9-9-003:055, 070, and 071 in Hālawa, on the island of O‘ahu. Although the proposed improvements will be implemented in phases, that, individually, may not have significant environmental impacts, Section 11-200.1-10, Hawaii Administrative Rules (HAR), requires that phases of a “larger total undertaking” be treated as a single action. Due to the collective scale of the Proposed Action, compliance with Chapter 343, Hawaii Revised Statutes (HRS), warrants the preparation and processing of an environmental impact statement.

Draft Environmental Impact Statement Requirements

On August 9, 2019, new rules regulating the implementation of HRS Chapter 343 went into effect. The new rules modified requirements for the Environmental Impact Statement (EIS) process.

Under the HAR § 11-200.1-23, the new rules outline requirements for “Consultation prior to filing a draft environmental impact statement.” This section of the HAR requires:

(a) An EISPN, including one resulting from an agency authorizing the preparation of an EIS without first requiring an EA, shall indicate in a concise manner:
   (1) Identification of the proposing agency or applicant;
   (2) Identification of the accepting authority;
   (3) List of all required permits and approvals (state, federal, and county) and, for applicants, identification of which approval necessitates chapter 343, HRS, environmental review;
   (4) The determination to prepare an EIS;
   (5) Reasons supporting the determination to prepare an EIS;
   (6) A description of the proposed action and its location;
   (7) A description of the affected environment, including regional, location, and site maps;
   (8) Possible alternative to the proposed action;
   (9) The proposing agency’s or applicant’s proposed scoping process, including when and where any EIS public scoping meeting will be held; and

(10) The name, title, email address, physical address, and phone number of an individual representative of the proposing agency or applicant who may be contacted for further information.

(b) In preparation of a draft EIS, proposing agencies and applicants shall consult all appropriate agencies, including the county agency responsible for implementing the country’s general plan for each county in which the proposed action is to occur and agencies having jurisdiction or expertise, as well as those citizen groups, and concerned individuals that the accepting authority reasonably believes to be affected. To this end, agencies and applicants shall endeavor to develop a fully acceptable draft EIS prior to the time the draft EIS is filed with the office, through a full and complete consultation process, and shall not rely solely upon the review process to expose environmental concerns.

(c) Upon publication of an EISPN in the periodic bulletin, agencies, citizen groups, or individuals shall have a period of thirty days from the initial publication date to make written comments regarding the environmental effects of the proposed action. With explanation, the accepting authority may extend the period of comments for a period not to exceed thirty additional days. Written comments and responses to the substantive comments shall be included in the draft EIS pursuant to section 11-200.1-24. For the purposes of the EIS public scoping meeting, substantive comments shall be those pertaining to the scope of the EIS.

(d) No fewer than one EIS public scoping meeting addressing the scope of the draft EIS shall be held on the island or islands most affected by the proposed action, within the public review and comment period in subsection (c). The EIS public scoping meeting shall include a separate portion reserved for oral public comments and that portion of the EIS public scoping meeting shall be audio recorded.

HAR § 11-200.1-24 speaks to requirements of the draft EIS. The relevant sections are below:

(r) The draft EIS shall include a separate and distinct section that contains a list identifying all government agencies, other organizations and private individuals
consulted in preparing the draft EIS, and shall disclosure the identity of the persons, firms, or agency preparing the draft EIS, by contract or other authorization. (s) The draft EIS shall include a separate and district section that contains:
(1) Reproductions of all written comments submitted during the consultation period required in section 11-200.1-23; n
(2) Responses to all substantive written comments made during the consultation period required in section 11-200.1-23. Proposing agencies and applicants shall respond in the draft EIS to all substantive written comments in one of two ways, or a combination of both, so long as each substantive comment has clearly received a response:
(A) By grouping comment responses under topic headings and addressing each substantive comment raised by an individual commenter under that topic heading by issue. When grouping comments by topic and issue, the names of commenters who raised an issue under a topic heading shall be clearly identified in a distinctly labeled section with that topic heading. All substantive comments within a single comment letter must be addressed, but may be addressed throughout the applicable different topic areas with the commenter identified in each applicable topic area. All comments, except those described in paragraph (3), must be appended in full to the final document; or
(B) By providing a separate and distinct response to each comment clearly identifying the commenter and the comment receiving a response being responded to for each comment letter submitted. All comments, except those described in paragraph (3), must either be included with the response, or appended in full to the final document;
(3) For comments that are form letters or petition, that contain identical or near-identical language, and that raise the same issues on the same topic:
(A) The response may be grouped under paragraph (2) (A) with the response to other comments under the same topic and issue with all comments identified in the distinctly labeled section identifying commenters by topic; or
(B) A single response may be provided that addresses all substantive comments within the form letter or petition and that includes a distinct section listing the individual commenters who submitted the form letter or petition. At least one representative sample of the form letter or petition shall be appended to the final document; and
(C) Provided that, if a commenter adds a district substantive comment to a form letter or petition, then that comment must be responded to pursuant to paragraph (2);
(4) A summary of any EIS public scoping meetings, included a written general summary of the oral comments made, and a representative sample of any handout provided by the proposing agency of applicant related to the action provided at any EIS public scoping meeting;
(5) A list of those persons or agencies who were consulted and had no comment in a manner indicating that no comment was provided; and
(6) A representative sample of the consultation request letter.

These activities are being coordinated with the Department of Accounting and General Services, the state agency overseeing the EIS development. The Aloha Stadium Authority and the Hawaii Community Development Agency (HCDA) have limited engagement in these activities as to preserve the integrity of the EIS as a neutral disclosure document.
Public Scoping and Community Engagement for the EISPAN

To ensure robust public engagement with the EIS process and full compliance with HAR § 11-200.1, a scoping plan was developed and implemented in consultation with the EIS planning team and the Department of Accounting and General Services, State of Hawai‘i (DAGS), who serves as the proposing agency on the EIS.

The identified stakeholders can be generally separated into three categories:

- Federal, state, and county agencies;
- Area stakeholders and community groups; and
- Project area users.

A good faith effort was made to contact and consult with all three categories of stakeholders. Each group is detailed below.

Notice to federal, state, and county agencies

Wilson Okamoto Corporation (WOC), which serves as the lead planner on the EIS, sent a notice of the availability of the EISPAN to agencies believed to have jurisdiction or expertise as well as those citizen groups and individuals reasonably believed to be affected by the Proposed Action. Those parties included:

Federal Agencies

U.S. Army Corps of Engineers, Honolulu District
U.S. Department of the Interior
U.S. Environmental Protection Agency
U.S. Department of the Navy
U.S. National Park Service

State Agencies

Department of Business, Economic Development and Tourism (DBEDT)
Department of Agriculture (HDOA)
Department of Accounting and General Services (DAGS)
DBEDT, Strategic Industries Division
DBEDT, Land Use Commission (LUC)
DBEDT, Office of Planning (OP)
Department of Education (DOE)
Department of Defense (Hi-DoD)
Department of Health, Office of Environmental Quality Control (OEQC)
Department of Health, Environmental Management Division (EMD)
Department of Health, Hazard Evaluation and Emergency Response Office
Department of Health, Kīnaʻu Hale
Department of Health, Wastewater Branch
Department of Land and Natural Resources (DLNR)
DLNR, Division of Forestry and Wildlife (DoFAW)
DLNR, Land Division
DLNR, Office of Coastal and Conservation Lands (OCCL)
DLNR, Engineering Division
DLNR, State Historic Preservation Division (SHPD)
DLNR, Commission on Water Resources Management (CWRM)
Department of Hawaiian Homelands (DHH)
Office of Hawaiian Affairs (OHA)
Department of Transportation (HDOT)
Department of Transportation, Airport Division

City and County of Honolulu Agencies

Honolulu Fire Department
Department of Environmental Services
Department of Planning and Permitting
Department of Parks and Recreation
Department of Design and Construction
Board of Water Supply (HBWS)
Honolulu Police Department (HPD)
Department of Transportation Services (DTS)
Department of Facility Maintenance
Office of the Mayor

Other

Senator Breene Harimoto
Senator Glenn Wakai
Representative Aaron Ling Johanson
Representative Sam Satoru Kong
Councilmembers Joey Manahan
Hawaiian Telcom
Hawaii Gas
Hawaiian Electric Company
Spectrum Hawaii
ʻAhina ʻAhu ʻIo Nahua Neighborhood Board No. 18
ʻAiea Neighborhood Board No. 20
ʻAiea Community Association

Area stakeholders and community groups

Public Notices

In an effort to fully engage constituents, particularly Native Hawaiian organizations, whose participation in the EIS process helps to ensure compliance with Act 50 (2000) and help the EIS to assess cultural impacts of the proposed action, a notice will be placed by Honua Consulting in the Ka Wai Ola (the Office of Hawaiian Affairs monthly newspaper) in the September 2019 edition, the same month the EISPN will be published. The Ka Wai Ola is available online and is also published in hardcopy and distributed to over 60,000 recipients, many of them members of the Hawaiian community. The September 2019 edition becomes available starting September 1, 2019.

This notice was placed in the “Public Notices” section of the Ka Wai Ola and invited practitioners to participate in the Cultural Impact Assessment and provide contact information for Honua Consulting.

A media advisory was distributed through the media consultants (CommPac) regarding the availability of the EISPN through The Environmental Notice on September 8, 2019. Notice as to the Scoping Meeting was also distributed to the area businesses by CommPac.

The EISPN was first published by the Office of Environmental Quality Control on September 8, 2019. The Environmental Notice is published via email to a self-subscribing list. A link to the September 8, 2019 is provided in this email notice.

Notices as to the availability of the EISPN was also be distributed to the appropriate agency list by Wilson Okamoto Corporation (WOC). Additional stakeholders, civil groups, and parties with an interest in the project will also be sent the identical notice informing them of the publication of the EISPN, notice as to the September 25, 2019 scoping meeting, provide information as how to provide comments on the EISPN, and provide both agency and applicant contact information regarding questions.

A project website nased.hawaii.gov has also been developed and provides information on the EIS process and mechanisms for input. The website is owned by DAGS, as it is a Hawaii state government (hawaii.gov) address, but it is managed by WT Partnership with support from CommPac. Updates to the website are approved by DAGS and then made by WT Partnership.

CommPac also developed and manages an email listserv that regularly aggregates stakeholder emails and provides electronic newsletters updating members of the listserv on a periodic basis.
Community and Stakeholder Engagement

The Project Team (including the client and contractors, along with project planner WOC) began attending Neighborhood Board meetings with jurisdiction over the physical project area (Neighborhood Board No. 20 – ‘Aiea and Neighborhood Board No. 18 – ‘Aliamanu / Salt Lake) in September 2019. At the request of the Neighborhood Boards, representatives from the project team will attended the meetings on a regular basis to provide updates to the boards. This took place until the COVID-19 crisis led Mayor Kirk Caldwell to suspend neighborhood board meetings beginning in April 2020.

At the request of the respective stakeholder groups, the team will also began regularly attend the monthly meetings of the ‘Aiea Community Association in September 2019, and the Quarterly meeting of the Swap Meet vendors beginning in October 2, 2019. The Swap Meet vendors were sent email notices as to the availability of the EISPN and notice of the September 25, 2019 Scoping Meeting.

CommPac coordinated distribution of notices to area businesses and neighboring residential areas (CrossPointe and Hālawa Estates).

Publication of the EISPN and Notice as to Availability

The EISPN was published in compliance with the new administrative rules in the Office of Environmental Quality and Control’s public notice bulletin The Environmental Notice on Sunday, September 8, 2019 as scheduled. The permanent link for this publication is: http://oeqc2.doh.hawaii.gov/The_Environmental_Notice/2019-09-08-TEN.pdf

The project was prominently featured on the cover of the publication.

Figure 1. Cover of The Environmental Notice on September 8, 2019 featuring the availability of the EISPN

The project information as detailed in the contents of the publication are as follows:
Pre-Consultation with Community Groups and Stakeholders

Pre-consultation began by CommPac in early September. This list, developed by CommPac, includes a diverse range of stakeholders.

Environmental Impact Statement Public Notice Timeline
Published in Environmental Notice – September 8, 2019
Comment Period for the EISPN Closing Date – October 8, 2019

Media Coverage
CommPac coordinated for media coverage of the released of the EISPN. This included front page coverage on the daily newspaper, the Honolulu Star Advertiser.
The permanent link for the online version of the article is available at: https://www.staradvertiser.com/2019/09/09/hawaii-news/plans-for-new-stadium-taking-shape/.

KITV Island News 4 also covered the release of the EISPN and announced the scoping meeting. The full video can be viewed online at https://www.kitv.com/story/41024806/new-aloha-stadium-renovations-downsizing-seats-adding-hotels-housing-retail-space.
Public and Community Notices for the Scoping Meeting

Flyers for the Scoping Meeting were distributed at the following public meetings:

- Neighborhood Board No. 20 (‘Aiea) – September 9, 2019
- Neighborhood Board No. 18 (‘Aliamanu – Salt Lake) – September 12, 2019
- ‘Aiea Community Association Meeting – September 16, 2019

Public announcements for the Scoping Meeting included were also disseminated by the project’s media relations firm CommPac.

Extension of Scoping Period Deadline

The proposing agency, the Department of Accounting and General Services, State of Hawai‘i (DAGS), determined to extend the administrative public review and comment period an additional 30 days. This decision was made by the agency to allow the public additional time to provide comments to the EISPN. On September 23, 2019, an announcement was published in The Environmental Notice providing the public notice of the new deadline, which was November 8, 2019.

The project was again prominently featured on the cover of The Environmental Notice.
EISPN Scoping Meeting

The public scoping meeting for the EISPN took place on September 25, 2019 at the Aloha Stadium Hospitality Room, located at 99-500 Salt Lake Boulevard, Honolulu, Hawaii 96818. An optional tour of the facility was offered prior to the meeting at 6:00 p.m. The meeting officially began at 7:00 p.m. Public scoping comments were taken during the meeting and recorded per the Hawaii Administrative Rules. A copy of that recording will be provided to OEOC. Summary of the comments received during the meeting will be recorded and included with this report and the Draft EIS.

Notice of the new deadline was also provided during the October neighborhood board meetings for Neighborhood Board No. 18 and No. 20, as well as the ‘Aiea Community Association meeting in October.

Updated flyers and public notices for the extended deadline for the EISPN were distributed and provided at the following public meetings:

- Neighborhood Board No. 20 (‘Aiea) – October 10, 2019
- Neighborhood Board No. 18 (Ālamanu – Salt Lake) – October 14, 2019
- ‘Aiea Community Association Meeting – October 21, 2019

Figure 9. Layout of the Aloha Stadium hospitality room where the scoping meeting took place
Oral Comments Received at the Public Scoping Meeting

There were 76 participants in the New Aloha Stadium Entertainment District (NASED) Programmatic Environmental Impact Statement (PEIS) Scoping Meeting and Public Comment Period, of which 18 members testified. Participants included representatives of local community associations and neighborhood boards, residents, the Faith Action for Community Equity (FACE) group, swap meet vendors, and concerned citizens. The primary points of comments included: traffic, affordable housing, recreational opportunities, stadium capacity, the swap meet, environmental concerns, communication/transparency, and construction/budgetary concerns. A more detailed compilation of the comments are as follows:

- Traffic Impacts
  - Residents, community association members, and neighborhood board representatives expressed concern about increased traffic and congestion, and solicited solutions to these issues. Any increase in population of the area will increase traffic. The bike, rail and pedestrians should be integrated into traffic seamlessly.
  - Some residents expressed need of widening Salt Lake Boulevard with increased traffic from freeway shutdowns; there was also a need to improve the traffic flow of the area.

- Affordable Housing
  - FACE was the primary advocate of utilizing the space for affordable housing due to the increase in homeless populations across the state. They highlighted the proximity to the rail station, so cars will not be as utilized to increase traffic. A FACE member expressed that the site should be called the Aloha Stadium Village to put focus on housing rather than entertainment. Additionally, the affordable housing should be included in the “purpose and needs” section of the PEIS and there should be an effort to discover the total number of units that can be built with less parking spaces.
  - Residents stated that there should be more affordable housing than hotels, of which there are numerous in other tourist locations on-island. Other residents argued that the traffic, roadways, and parking should be fixed before increasing residents because despite the rail location nearby, cars will continue to be in use until no longer necessary.

- Recreational Opportunities
  - Residents and community association members alike expressed a desire for open spaces to be used for recreation, such as parks, courts, playgrounds, green spaces, and mixed-use community centers that may be utilized for daycares and keiki/kupuna activities. Tribute may be paid to Pearl Harbor with story boards, and mini museums may be created with the input of cultural practitioners.
  - Recommendation that the parking lots be used during the weekdays for nearby businesses, and the stadium may charge fees. Residents want the lots to be open for children to ride bikes off of the roads, but were denied in the past without explanation.
• A resident also expressed need for affordable retail spaces, as they are being pushed out of Pearlridge and Pearl Highlands with Transit-Oriented Development projects.

• Stadium Capacity
  o Citizens expressed concern of capping the capacity at 35,000 as too low, and recommended at least 40,000. This can attract larger events such as the Pro Bowl and large concerts. The stadium will not always fill, but they should look at capacity to grow.

• Swap Meet
  o Vendors expressed concern about the swap meet’s future and requested a definitive answer. Hundreds of vendors would be affected if closed, and there is no feasible alternate location. One vendor advocated for the tourists that come to Hawai‘i and the swap meet to bargain; the configuration of the stadium should remain so that the swap meet can continue with development.

• Environmental Concerns
  o A resident stressed the importance of containing chemicals like lead that may spread to the community during demolition. Another resident recommended dredging Hālawa Stream for continuous flow during construction to eliminate debris, as multiple streams are affected and the Loko Paiau restoration has water diverted.

• Communication and Transparency
  o Citizens want better communication about the PEIS process to keep the public informed, as miscommunication and “back and forth” causes confusion and increased tax dollars spent for resolution. At the next scoping meeting, there was a request for comments to be made on the more comprehensive design created at the conclusion of this meeting with public input considered.

• Construction and Budgetary Concerns
  o One citizen with a construction background recommended: duct work and eaves needs to be tight to decrease water leakage that may cause rust; dehumidifiers should be utilized to decrease moisture; air cleaners will decrease body odor concerns; prototypes be created for builders; and the stadium being built of foam and concrete will decrease costs.

  o The community association recommended making the stadium smaller and closer to ‘Aiea Elementary, which is empty during major events, and constructing the walkway so that it enters directly into the stadium area.

  o Residents expressed the need to address the noise and vibration, as they are able to hear concerts in their living rooms that shake the windows. The stadium should not be constructed closer to houses, as noise is enough of an issue where the stadium currently sits.

  o Citizens expressed the need to remain within the budget as the rail is already far beyond projections; there should be a contingency plan in the event that the project exceeds the current budget projections.

Written Comments Received in Response to the EISPN

<table>
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<tr>
<th>Comment Period Start Date</th>
<th>Comment Period End Date</th>
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<td>9/8/19</td>
<td>11/7/19</td>
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As of November 14, 2019, one week after the formal closing date of the scoping period (November 7, 2019), a total of 45 written comments were received from the public, which include those received from the Scoping Meeting, mail, and those received via email. The primary points of comments included: affordable housing, entertainment district amenities, stadium capacity, public safety, economic concerns, traffic, environmental concerns, swap meet and 50th State Fair. A more detailed compilation of the comments are as follows:

• Affordable Housing
  o Several form comments sent stated that the NASED should include more than 2,000 housing units as the project is an opportunity for the State to develop a mass of affordable housing units (80% AMI or below). The comments also urge the proposal to revise its count to include 5,000 housing units to account for the growing population.
  o One commenter would like the New Aloha Stadium to be put in an alternate location (UH Mānoa Campus) so that the current site can be completely developed for affordable housing.
Several more comments came in regarding more affordable housing and the potential for the site to increase the State’s inventory of affordable housing.

**Entertainment District Amenities**
- These comments raised considerations for a museum dedicating all the influential people from Hawaii, and recreational facilities such as gyms, various courts, and green spaces.
- One commenter would like to see gardens and aquaculture included at the NASED.
- Open spaces should be left to the community to recreate.
- Inclusion of a museum on site.

**Stadium Capacity and Design**
- These comments raised concern over the proposed NASED stadium as it is downsizing from the existing stadium. The commenters would like to see a larger stadium than the one being proposed. One commenter would even like the proposed stadium be increased to 80,000 and host the super bowl.
- One commenter would like the new Aloha Stadium design to be ADA compliant and “height” friendly.

**Public Safety**
- One comment was concerned about the stadium’s proximity to the proposed rail line and Kamehameha Highway should any type of accident/incident occur.

**Economic Concerns**
- One comment wanted to see an economic evaluation of impacts to our state debt and a fair analysis of funding priorities statewide as outer islands lack proper infrastructure.
- All forms of monies going into the project and NASED’s potential generation for the State.

**Traffic Concerns**

Several comments referenced traffic impacts to the surrounding/adjacent neighborhoods and how the NASED project should attempt to correct these issues.
- DOT-Highways may require a more detailed Traffic Impact Analysis Report be prepared once a preferred option selection is made to further analyze the project’s effects to State highways and may recommend improved based upon the analysis.
- Availability of parking on site and its potential impact to the surrounding neighborhoods.

**Infrastructure Requirements**

Several comments from community members in the adjacent neighborhoods are concerned about noise from construction and the current event that take place in the Aloha Stadium.
- The EIS should discuss range of noise attenuation strategies that could be considered in facility and site design, building materials, landscaping, and event management.
- Use of renewables and energy efficient technology to lower the energy demand of the NASED.
- Identify whether there are any environmental hazards on the site from contamination and the remediation for those potential hazards to protect water resources.
- Drainage on the site and stormwater runoff controls/low impact development considerations.
- How the NASED project will contribute to adverse climate change impacts and alternatives to mitigate them/the potential impacts of sea level rise to the NASED Project.

**Swap Meet and 50th State Fair**
- One commenter was concerned about the construction impacts to the Swap Meet and if there would be enough space for the site to continue to host the 50th State Fair.
- Vendors of The Aloha Stadium Swap Meet strongly support the layout of “Option A.” – supported with 28 pages of signatures.
- One commenter wants a farmers’ market in conjunction with the Swap Meet.

**Environmental Concerns**
- Several comments from community members in the adjacent neighborhoods are concerned about noise from construction and the current event that take place in the Aloha Stadium.
- The EIS should discuss range of noise attenuation strategies that could be considered in facility and site design, building materials, landscaping, and event management.
- Use of renewables and energy efficient technology to lower the energy demand of the NASED.
- Identify whether there are any environmental hazards on the site from contamination and the remediation for those potential hazards to protect water resources.
- Drainage on the site and stormwater runoff controls/low impact development considerations.
- How the NASED project will contribute to adverse climate change impacts and alternatives to mitigate them/the potential impacts of sea level rise to the NASED Project.

**Swap Meet and 50th State Fair**
- One commenter was concerned about the construction impacts to the Swap Meet and if there would be enough space for the site to continue to host the 50th State Fair.
- Vendors of The Aloha Stadium Swap Meet strongly support the layout of “Option A.” – supported with 28 pages of signatures.
- One commenter wants a farmers’ market in conjunction with the Swap Meet.

**Infrastructure Requirements**

Several comments referenced traffic impacts to the surrounding/adjacent neighborhoods and how the NASED project should attempt to correct these issues.
- DOT-Highways may require a more detailed Traffic Impact Analysis Report be prepared once a preferred option selection is made to further analyze the project’s effects to State highways and may recommend improved based upon the analysis.
- Availability of parking on site and its potential impact to the surrounding neighborhoods.
• Permit Requirements
  o The Commission on Water Resources Management (CWRM) stated that a Stream Channel Alteration Permit is required before any alteration can be made to the bed and/or banks of a stream channel.
  o Project is within 5 miles of the airport and requires reading the Technical Assistance Memorandum for guidance with development and activities that may require further review and permits from DOT-Airports
  o Submittal of FAA Form 7460-1 Notice of Proposed Construction or alteration pursuant to the Code of Federal Regulations, Title 14, Part 77.9 due to being within 20,000 feet of a public use or military airport. Construction equipment and staging areas heights, including heights of temporary construction cranes need to be included in the submittal.
  o PV hazards shall mitigate the hazard upon notification by DOT-Airports and/or FAA

• Anticipated Number of Residential Units
  o DOE suggests a discussion on the number of anticipated residential units to be developed as it will impact the current schools serving the area. There should also be an explanation of the educational amenity. The Project is located within the Leeward Oahu School Impact Fee District and will be subject to Chapter 302A-1606 HRS and should meet with DOE as soon as possible to execute an Educational Contribution Agreement.

• Project Logistics
  o Inclusion of contracts awarded for the project and timeline for each stage/milestone of the project including demolition, construction, and operation.

• Consistency with Plans and Land Uses
  o Comments from the Engineering Division of the Department of Land and Natural Resources suggests a discussion of water demands and infrastructure required to meet the project needs as it will be required as a submittal (water demands and calculations).
  o The EIS will need to discuss wastewater system capacity and planned improvements by the City as it will impact Phase 1 and subsequent phases

• Navy
  o The navy requests on going engagement to ensure development is compatible with Navy’s land uses and mission, and to minimize any potential impacts to their operations, especially those regarding operational security

Reporting Results to the Community

After the public comment period closed for the EISP on November 7, 2019, the project team attended the meetings for Neighborhood Boards No. 18 and No. 20 and the ACA monthly meetings and reported the preliminary results of the scoping process to the community. Oral presentations were made and summaries of the comments were provided in handouts to the attendees.

Monthly meetings for November:

  • Neighborhood Board No. 20 (‘Aiea) – Recess
  • Neighborhood Board No. 18 (Āliamanu – Salt Lake) – November 14, 2019
  • ‘Aiea Community Association Meeting – November 18, 2019

At the November meetings, the team provided summaries of the comments received during the public scoping period.
Publication in *Ka Wai Ola*

Notice of the preparation of the Cultural Impact Assessment (CIA) was published on September 1, 2019 in the *Ka Wai Ola* as scheduled.

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**CULTURAL IMPACT ASSESSMENT NOTICE**

Honua Consulting is preparing a Cultural Impact Assessment (CIA) in conjunction with the Environmental Impact Statement (EIS) for the New Aloha Stadium Entertainment District. The Proposed Action will encompass the construction of a new stadium facility in addition to related ancillary development that will serve to create a New Aloha Stadium Entertainment District on the existing Aloha Stadium site in Hālawa. The existing Aloha Stadium site is an 88-acre parcel located on the southern portion of the Island of O‘ahu. The project area is located within the ahupua‘a of Hālawa in the moku of ‘Ewa, Tax Map Key (TMK) (1) 9-9-003-61. Honua Consulting is conducting primary research both in English and ‘Ōlelo Hawai‘i to identify valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary Native Hawaiian rights are or were historically exercised in the project area or surrounding ahupua‘a. We are seeking to interview and consult with cultural or lineal descendants or other knowledgeable individuals who may have information about cultural resources and practices in the project area or surrounding ahupua‘a. Interested parties may contact Dr. Kehaulani Watson by email at admin@honuaconsulting, by phone at (808) 392-1517, or via USPS at 4348 Waialae Ave. #254 Honolulu, HI 96816.

There were no responses received to this notice.

Honua Consulting set up a station during the EISPN public scoping meeting on the cultural resources in the area and staffed this station with two staff members, including one with a M.A. in Hawaiian language, who had the ability to communicate with community members in the Hawaiian language. The staff used this opportunity to discuss cultural issues with stakeholders and offer stakeholders the opportunity to be interviewed for the CIA. Additional discussion on this topic is provided in the draft CIA.

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**Public Outreach and Consultation for the Master Planning Process**

**Ongoing Public Engagement**

The project team continued to attend the neighborhood board meetings for Neighborhood Boards No. 18 and No. 20 and the ACA monthly meetings in order to maintain a strong working relationship with area stakeholders and to keep the community informed as to project process and events.

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![Figure 11. Notice Published in the Ka Wai Ola](image1)

![Figure 12. D4SS Project Manager, Christine Kinimaka, presenting to the ‘Aiea Neighborhood Board No. 18 on January 13, 2020.](image2)
Minutes for all the meetings attended by members of the project team are included in the appendices. Only approved minutes for 2019 are available for the ‘Aiea Community Association.

At the encouragement of the ‘Aiea Community Association, the NASED team also set up an informational booth at the ‘Aiea Holiday Family Fair held on Saturday, December 14, 2019. During this event, the project team distributed information about the project to the public, provided flyers about the upcoming workshop, and collected emails for the electronic newsletter.

In December 2019, the project team then began the community workshops for the Master Planning process. The first of these meetings was held on Wednesday, December 18, 2019 and was open to the public. The second was held on Monday, January 27, 2020 for stadium vendors, licensees, users, and neighboring businesses.

Monthly meetings for December 2019:

- Neighborhood Board No. 18 (ʻĀliamanu – Salt Lake) – Recess
- Neighborhood Board No. 20 (ʻAiea) – December 9, 2019
- ‘Aiea Community Association Meeting – No meeting

Monthly meetings for January 2020:

- Neighborhood Board No. 18 (ʻĀliamanu – Salt Lake) – January 9, 2020
- Neighborhood Board No. 20 (ʻAiea) – January 12, 2019
- ‘Aiea Community Association Meeting – January 19, 2020

Monthly meetings for February 2020:

- Neighborhood Board No. 18 (ʻĀliamanu – Salt Lake) – February 13, 2020

Monthly meetings for March 2020:

- Neighborhood Board No. 20 (ʻAiea) – February 10, 2019
- ‘Aiea Community Association Meeting – February 17, 2019

Monthly meetings for March 2020:

- Neighborhood Board No. 18 (ʻĀliamanu – Salt Lake) – Recess due to COVID
- Neighborhood Board No. 20 (ʻAiea) – March 9, 2020
- ‘Aiea Community Association Meeting – Canceled due to COVID

Monthly meetings for April 2020:

- Neighborhood Board No. 18 (ʻĀliamanu – Salt Lake) – Recess due to COVID
- Neighborhood Board No. 20 (ʻAiea) – Recess due to COVID
- ‘Aiea Community Association Meeting – No meeting due to COVID

Monthly meetings for May 2020:

- Neighborhood Board No. 18 (ʻĀliamanu – Salt Lake) – Recess due to COVID
- Neighborhood Board No. 20 (ʻAiea) – Recess due to COVID
- ‘Aiea Community Association Meeting – No meeting due to COVID

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On March 13, 2020, City and County of Honolulu Mayor, Kirk Caldwell, announced all neighborhood board meetings would be canceled effective immediately and until further notice to help stop the spread of the novel coronavirus, commonly known as COVID-19.
Community Design Workshops

In December 2019 and January 2020, Crawford Architects led two community design workshops to solicit valued input from the community and area stakeholders into the conceptual master plan. Community input and transparent processes are critical to the success of the NASED. Community workshops (sometimes referred to as design workshops or charrettes) are an important element of this input and enhance transparency by giving stakeholders an opportunity to inform the design of the NASED early in the Master Plan and design process. Crawford Architects led these community workshops to offer members of the public and stakeholders meaningful opportunities to work with the design team to ensure that the design of the new District integrates community feedback and addresses critical social and economic needs.

Goals of Workshops

The express goals of the workshops were as follows:

- Build understanding about the history of project, including other planning efforts and previous initiatives that have informed the project (re: provide information so that all participants are operating from the same information and clearly understand previous decisions that have already been made and are not subject to discussion at the workshop);
- Report on the work that has been undertaken to date on the New Aloha Stadium Authority District;
- Create a space and opportunity to community members to provide input to the Master Plan and design of the NASED;
- Identify critical community and stakeholder issues, needs, and expectations; and
- Identify ways forward that build upon existing community engagement and partnerships to ensure that the district meets and exceeds the needs of its stakeholders.
Topic Areas / Subgroups / Stations

There were five (5) stations for public engagement during the workshop, they are identified below.

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<thead>
<tr>
<th>Table or Station</th>
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<tbody>
<tr>
<td>Sub-Topic 1: Traffic, Roads, Parking (Transportation Infrastructure)</td>
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<tr>
<td>Sub-Topic 2: Site Program and Amenities, Recreation, Culture</td>
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<tr>
<td>Sub-Topic 3: Stadium Design and Events</td>
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<td>Sub-Topic 4: Environmental and Sustainability, Surrounding Community</td>
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<tr>
<td>Virtual Reality &amp; Physical Models Station</td>
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Public Master Planning Community Workshop

Meeting Location
Aloha Stadium Hospitality Room
99-500 Salt Lake Boulevard
Aiea, Hawaii 96818

Date 12/18/2019
Time 7:00 pm – 9:00 pm, HST

There were approximately 50 participants in the New Aloha Stadium Entertainment District (NASED) Master Planning Community Workshop. The public was invited to participate in this workshop through a series of notices that included notifications to the area neighborhood boards, participation in the Aiea Holiday Fair, email notifications, and media notices. Participants included representatives of local community associations and neighborhood boards, residents, the Faith Action for Community Equity (FACE) group, swap meet vendors, and concerned citizens.

The workshop, led by Crawford Architects, and supported by other members of the project team, provided five (5) stations for public engagement during the workshop:

Sub-Topic 1: Traffic, Roads, Parking (Transportation Infrastructure)
Sub-Topic 2: Site Program and Amenities, Recreation, Culture
Sub-Topic 3: Stadium Design and Events
Sub-Topic 4: Environmental and Sustainability, Surrounding Community
Virtual Reality and Physical Model Station

The primary points of comments included: traffic, affordable housing, noise, recreational opportunities, stadium capacity, connectively, the swap meet, green space for the surrounding community. A more detailed compilation of the comments are as follows:

Sub-Topic 1: Traffic, Roads, Parking (Transportation Infrastructure)
- Having adequate parking on site
- Noise projection and its impact on surrounding residential community
- Designing parking to more effectively accommodate tailgating and other activities

Figure 14: Members of the public participating in the community design workshop on December 18, 2019.
• Addressing off-site parking in surrounding residential areas (i.e., people currently park off site in neighboring areas when going to events at Stadium to avoid parking fees)
• Improving traffic flow in and out of site
• Pedestrian access to site, particularly between rail station and stadium
• Creating rideshare zones to make it easier to for rideshare customers to access property
• Adding 20,000 affordable units
• Having adequate parking for residential units
• Green space
• Viewsheds

Sub-Topic 2: Site Program and Amenities, Recreation, Culture
• Activities for a wide range of users, including children
• Parking structures, including structures that include connectivity to other features on site
• Including retail and other commercial uses on site and at rail station
• Connect to Pearl Harbor Historic Trail / bike path / visitors center
• Make the site bike friendly
• Swat meet needs to be on concrete area, possibly south lot (no grass)
• Encourage small, local, vendors and shops
• Include a museum or other cultural interpretation
• 20,000 units of affordable housing
• Create a livable, connected community (connect to neighboring residential areas, parcels, including pedestrian overpasses)
• Consider noise impacts
• Including healthcare and other social services
• Address illegal parking and traffic issues
• Minimize need for a car and encourage multimodal access
• Consider security needs
• Create cultural space, like green space or other performance space
• Consider parking underground beneath a green space

Sub-Topic 3: Stadium Design and Events
• Consider proximity of stadium to rail station and adjacent neighborhoods
• Mitigation / minimize noise from stadium
• Keep swap meet during construction
• Ensure dust and contaminants can mitigated and contained during construction and removal of existing stadium
• Use native flora and cultural plants for native gathering purposes
• Incorporate cultural education of native landscape and history
• Mitigate lighting (shield down) to protect seabirds and marine life
• Option “C” is too close to residential areas (stadium on south lot)
• Need to add affordable housing
• Widen Salt Lake Boulevard
• Pedestrian promenade (as in Option “B”)

Sub-Topic 4: Environmental and Sustainability, Surrounding Community
• Design for an integrated community
• Limit car usage
• Lower carbon footprint
• Integrate permeable hard surfaces
• Create a multi-use amphitheater for community events and tailgating
• On site water detention for wetlands and wildlife
• LEED builds
• Use solar panels and other forms of renewable energy
• Address sea level rise, tsunami, climate concerns
• Affordable housing
• Preserve viewsheds / corridors
• Link to surrounding area
• Improve traffic issues

Virtual Reality and Physical Model Station
• Affordable housing / increase density
• Create open spaces where games can be viewed
• Maintain a sense of place
• Consider outward views as well as inward views
• Standing plazas with field views
• Design with a Hawaiian sense of place
• More UH branding in stadium design
• Murals on buildings

Master Plan Community Workshop for Stadium Vendors, Licensees, Users, and Area Businesses

Meeting Location          Date          Time
Aloha Stadium Hospitality Room  01/27/2020  7:00 pm – 9:00 pm, HST

In early January 2020, Crawford Architecture invited a comprehensive list of over 150 stadium vendors, users, licensees, and neighboring businesses to participate in a Master Plan Community Workshop for the New Aloha Stadium Entertainment District (NASED). Approximately 60 invitees participated in this Master Plan Community Workshop. The workshop, led by Crawford Architects, and supported by other members of the project team, provided five (5) stations for public engagement during the workshop:

• Sub-Topic 1: Traffic, Roads, Parking (Transportation Infrastructure)
• Sub-Topic 2: Site Program and Amenities, Recreation, Culture
• Sub-Topic 3: Stadium Design and Events
• Sub-Topic 4: Environmental and Sustainability, Surrounding Community
• Virtual reality tour and physical model station

The primary emphases of the comments received from the vendors, users, licensees, and neighboring businesses included concern for and interest in: traffic, site connectivity, need for open space for the swap meet and state fair, accommodations for vendors, competition with neighboring businesses, layout and sizes of stalls in parking lot, the need for more infrastructure (i.e., restrooms, electrical, water) throughout site, improving the field in stadium, needed improvement to the stadium facility. A more detailed compilation of the comments are as follows:

• Sub-Topic 1: Traffic, Roads, Parking (Transportation Infrastructure)
  o Improved stalls for swap meet
  o Location of swap meet in proximity to rail station
  o Identification of dedicated ride share (Lyft, Uber) locations
  o Ensure space(s) for tailgating
  o Need for bike baths throughout site
  o Quality asphalt for property
  o Stadium mall tenants expressed concern about competition once the site is built out
  o Connectivity from rail station to NASED
  o Need for open spaces for both swap meet and state fair
  o Connectivity with community
  o Ingress and egress with H-1

• Sub-Topic 2: Site Program and Amenities, Recreation, Culture
  o Hawaii and/or Hawaiian design / feel in the NASED
  o More permanent ATMs
  o Keep rent the same for swap meet vendors
  o Group surface parking together and group swap meet vendors together
  o Swap meet needs to be on concrete
  o Parking stalls need to be bigger (primarily concern of swap meet vendors); stall size needs to fit swap meet vans
• Rest nodes and seating areas at swap meet
  • Consistent signage for stadium and swap meet
  • Preference for Option A due to parking and location of vendors (vendors prefer commercial activities near rail station and mall vendors prefer retail further away from Stadium Mall)
  • Add restrooms outside in NASED
  • Add lighting for early morning swap meet set up

• Sub-Topic 3: Stadium Design and Events
  • Put open space in upper Halawa lot instead of low lot
  • Space for marching band warm up
  • Mix 50th State Fair with amphitheater
  • Rain shield
  • Improve field so compliant for rugby
  • At least four locked rooms
  • Keep field cool
  • Retractable roof
  • Consider logistics for 18,000 people for graduations
  • Support high school graduation activities, which require lining up 600-700 students at a time
  • Improve lighting
  • Egress for students and families
  • Accommodations for ADA compliance
  • Permanent fair asset (like the London Eye)
  • Footings for temporary buildings
  • Water, power, open space for large scale tents (footings)
  • Level ground required for temporary events set up
  • Grass field ideally for temporary events
  • Consider tailgating area
  • Improve lighting through NASED

• Sub-Topic 4: Environmental and Sustainability, Surrounding Community
  • No comments provided

• Virtual Reality and Physical Model Station
  • No comments provided

Conclusion

This project recognized public outreach and consultation as important components of the EIS and master planning processes from the outset and as a result developed and implemented a robust community engagement plan. Meetings were attended with community groups and key stakeholders about the proposed District. Community groups and stakeholders were consulted and asked to provide their feedback. Likewise, input was be solicited from key stakeholders representing business, entertainment, government, military, sports, television, tourism, and other industries. Through outreach and consultation with these groups, informed decisions were made during the planning process that addresses the community’s needs, as well as those of numerous stakeholders.

These efforts helped to support maximum transparency and solicitation of input into the Environmental Impact Statement Public Notice (EISPN) scoping process and master planning design process. These relationships and the resulting input were extensively considered throughout the production of the Draft EIS and conceptual master plan. It also influenced numerous aspects of these documents, including the design of the master plan.
DRAFT REGULAR MEETING MINUTES
THURSDAY, SEPTEMBER 12, 2019
SALT LAKE ELEMENTARY SCHOOL CAFETERIA

CALL TO ORDER: Chair Shigemasa called the meeting to order at 7:07 p.m. Quorum was established with eight (8) members present. Note: This nine (9)-member Board requires five (5) members to establish quorum and to take official Board action.

Board Members Present – Chair Chace Shigemasa, Joe Omura, Chandra Kanemaru, Len Pepper, Dennis Egge, Larry Barth, Pat Isaacs, and Michael Chapman.

Board Members Absent – David Yomes.

Guests – Joann Takeuchi (Governor David Ige’s Representative, Director of the Hawaii Department of Transportation); Kim Ryan (Congressman Ed Case’s Office); Christine Choi Kim (Representative Aaron Ling Johnson); Representative Linda Ichiyama, Shirley Templo (Councilmember John Manahan’s Office); Lieutenant Okajawa and Sergeant Nitta (Honolulu Police Department: District 3); Lieutenant Bueno and Sergeant Nitta (Honolulu Police Department District 5); Captain Mathew Melinis and Firefighter Darren Delorio (Honolulu Fire Department); Blaine Fergstrom (Board of Water Supply); Jason Taymin (Nan Inc.), Danny Rosato (Road and Highway Builders), Victor Flet (Naval Facilities Engineering Command), Suzette Adversado, Bob Cunningham and Keith Ichikawa (Residents), Deputy Manager Ryan Andrews (Aloha Stadium Authority); Dr. Trisha Kahaunui Watson (preliminary Consulting), Christopher Naylor (Neighborhood Commission Office). Note: Name was not included if not legible or on the guest attendance sheet.

Roll Call of Board Members – Kanemaru carried out a roll call and confirmed that the Board had quorum with eight (8) members present.

PUBLIC SAFETY REPORTS

Hearing no objections, Chair Shigemasa moved to Agenda Topic: Honolulu Police Department District 3.

Honolulu Police Department District 3 – Pearl City for Foster Village – Sergeant Nitta reported the following:

- July 2019 Statistics: There were five (5) motor vehicle thefts, three (3) burglaries, 13 thefts, and five (5) Unauthorized Entering into Motor Vehicles (UEMV). There were 344 calls for service in Foster Village.
- August 2019 Statistics: There were two (2) motor vehicle thefts, three (3) burglaries, 14 thefts, and two (2) Unauthorized Entering into Motor Vehicles (UEMV). There were 364 calls for service in Foster Village. Statistical information can be found on the HPD public website, www.honolulu.pd.org.
- Safety Tip – Lock and secure your vehicles, do not leave items of value in plain view.
- On-going Incident: Sergeant Nitta noted that HPD will be returning to the scene of the Paisasides incident and will follow up.

Hearing no objections, Chair Shigemasa returned to Agenda Topic: Honolulu Fire Department.

Honolulu Fire Department (HFD): Firefighter David Jones was present; the following report was:

- August 2019 Statistics: There was one (1) structure problem, three (3) wildland/bush fires, one (1) nuisance fire, two (2) cooking fires, 13 activated alarms, 125 medical emergencies, 34 medical emergencies attended by Emergency Medical Services (EMS) prior to HFD, one (1) motor vehicle collision with pedestrian, five (5) motor vehicle crashes/collisions, two (2) mountain rescue, and one (1) hazardous material incident.
- Follow Up: HFD noted that EMS attended 27 out of 119 emergency calls before HFD in June 2019.
- Safety Tip: Senior Citizen Safety: The HFD has the following guidelines for senior citizens, which will enable us to assist you during a medical emergency:
  - Always call 911 first for any emergency.
  - Have a list of medications and your medical history ready.
  - Know where your advanced directives are (Comfort Care only- Do Not Resuscitate, Physician Orders for Life-Sustaining Treatment, etc.).

Questions and concerns followed:

1. Noise Concerns: Baird noted that the lower lot is very close to the community and stated that the Swap Meet created a large noise concern during their setup. Baird noted that they began setup around 4:00 a.m. and asked if the noise could be mitigated.
2. Racing Events: Baird noted that the racing events do not raise noise concerns but stated that the racing events cause an in community until 10:00 p.m. after the event has ended.
3. Community Reports: Umura asked if future events could be reported to the island so that the community could raise their concerns. Andrews stated that the information can be found at https://aiaa.thestadium.hawaii.gov and noted that he can disseminate the information to the Board.
4. Project Update: Peerpe notes that the new stadium will mitigate traffic and noted his need for assurances about its future. Peerpe stated that there would be a protective layer of rust and stated that this has led to the continuing costs of repairs. Peerpe asked how the project would not exceed its budget like the rail system. Baird asked if hotels are within the plans and Watson noted that hotels, restaurants, and stadium changes would be considered. Baird noted that there have already been three (3) plans that have been considered. Watson noted that they have not chosen any plans yet. Umura asked if the plans would be sent shown to the Salt Lake & Aliamanu Neighborhood Boards. Watson noted that the probing EIS leads into design workshops where independent designers come and propose plans. Watson noted that the Wednesday, September 25th meeting will be more robust and Chair Shigemasa noted that there will be a presentation at the October 2019 Meeting. Peerpe asked if Kapuna or Kapuna Care centers would be considered. Baird asked and Andrews noted that they are aiming to complete the project by football season 2020. Ishikawa asked why three (3) plans were reported to the community if they had not been chosen and whom reported to them the community. Watson stated that they released the information to the community in the communication within the community and noted that importance of having community input on possible ideas. Umura asked how they would have University of Hawaii (UH) football games if they build over the current site and Watson stated that this may be a possibility. Watson noted that

ALIAMANU/SALT LAKE/FOSTER VILLAGE, NEIGHBORHOOD BOARD NO. 18

DRAFT REGULAR MEETING MINUTES
THURSDAY, SEPTEMBER 12, 2019
SALT LAKE FOSTER VILLAGE, NEIGHBORHOOD BOARD NO. 18

- Do you live alone? Ensure there is adequate access to reach you.
- Ensure your address is clearly marked and easy to see.

Honolulu Police Department District 5 – [Aliamanu] for Salt Lake/Aliamanu – Lieutenant Bueno reported the following:

- July 2019 Statistics: There was one (1) burglary, 10 motor vehicle thefts, 8 thefts, and four (4) UEMVs. There were 631 calls for service.
- August 2019 Statistics: There were two (2) burglaries, five (5) motor vehicle thefts, eight (8) thefts, and 13 UEMVs. There were 865 calls for service. Statistical information can be found on the HPD public website, www.honolulu.pd.org

COMMUNITY EVENTS & CONCERNS:

Malama Moana: Keith Ichikawa was present for Malama Moana and stated that they are trying to preserve Ali Moana Beach Park. Malama Moana are opposed to the City and County of Honolulu plans for a commercial venue. Malama Moana is asking the community to inform their City Councilmembers of their stance on the proposed project.

Questions and comments followed:

1. Resolution: Egge asked him if they have a resolution and asked that it be submitted to the Board for adoption.
2. Opposition to Plan: Peerpe asked if Ishikawa noted that they are opposed to the addition of a dog park and playground. Ishikawa noted that they are opposed to the lack of community input and information about the changes to the plans. Ishikawa noted that Kakako could be used as a possible location and stated their want to keep Ali Moana a community park.

PRESENTATIONS:

Aloha Stadium Authority – Deputy Manager Ryan Andrews: The following presentation was given:

- Stadium Update: Deputy Manager Andrews noted that 2015 was the most successful event in the 44 year history of the stadium.
- Community Concerns: Andrews noted that there are community concerns about traffic and noise mitigation. Andrews stated that he worked on the July 2019 event in the Diamond Head parking lot that caused noise concerns for the surrounding community. Andrews noted that the parking lot will no longer be used for events and stated that this was in an attempt to be a good neighbor.

Questions and concerns followed:

1. Noise Concerns: Baird noted that the lower lot is very close to the community and stated that the Swap Meet created a large noise concern during their setup. Baird noted that they began setup around 4:00 a.m. and asked if the noise could be mitigated.
2. Racing Events: Baird noted that the racing events do not raise noise concerns but stated that the racing events cause an in community until 10:00 p.m. after the event has ended.
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4. Project Update: Peerpe notes that the new stadium will mitigate traffic and noted his need for assurances about its future. Peerpe stated that there would be a protective layer of rust and stated that this has led to the continuing costs of repairs. Peerpe asked how the project would not exceed its budget like the rail system. Baird asked if hotels are within the plans and Watson noted that hotels, restaurants, and stadium changes would be considered. Baird noted that there have already been three (3) plans that have been considered. Watson noted that they have not chosen any plans yet. Umura asked if the plans would be sent shown to the Salt Lake & Aliamanu Neighborhood Boards. Watson noted that the probing EIS leads into design workshops where independent designers come and propose plans. Watson noted that the Wednesday, September 25th meeting will be more robust and Chair Shigemasa noted that there will be a presentation at the October 2019 Meeting. Peerpe asked if Kapuna or Kapuna Care centers would be considered. Baird asked and Andrews noted that they are aiming to complete the project by football season 2020. Ishikawa asked why three (3) plans were reported to the community if they had not been chosen and whom reported to them the community. Watson stated that they released the information to the community in the communication within the community and noted that importance of having community input on possible ideas. Umura asked how they would have University of Hawaii (UH) football games if they build over the current site and Watson stated that this may be a possibility. Watson noted
that there were also proposals to build the stadium at a different location on site that would keep events going. Watson noted that importance of garnering community input and disseminated a frequently asked questions (FAQ) sheet to the community.

b. Signage:: soybean why framing signs are not used and Andrews noted that there are none.

c. Community Meeting: Watson noted that there will be a community meeting at Alpha Stadium on Wednesday, September 25, 2019. Watson noted that this will be the beginning of the Environmental Impact Study (EIS) that has a 30 day community commenting period. Watson noted that a draft EIS will be written and released in 2020 with the final EIS being written during the end of 2020. Watson noted that the EIS is meant to suggest a wide scale of project possibilities before the contractors create their own plans. Watson noted the importance of having community input during the process. Pepper asked and Watson noted that the contractor would be creating the plan for the project but stated that they will not be able to exceed the limits set by the EIS. Peppers asked when the EIS is focused on and Watson noted that importance of garnering community input from the Asa, Foster Village, Salt Lake, and surrounding region.

d. Cultural Management: Kanemaru asked if there will be 'iwi in the EIS and Watson noted that they are doing that.

GOVERNMENT OFFICIAL REPORTS

Congressman Ed Case’s Representative: Kim Ryan was present; the following report was given:

- Community Meeting: Ryan thanked Chair Shigemasa for attending a meeting with Congressman Ed Case and other community members from his district.
- Red Hill Fuel Storage Update: Ryan noted that the Administrative Order of Consent is now in the hands of the regulatory agencies before the information is released to the public.
- Community Meeting: There will be a community meeting held on Thurs., October 3, 2019 at Pearl Ridge Elementary School. The meeting will be held from 6:30 p.m. until 8:30 p.m. in the school’s cafeteria.

Questions and comments followed: Community Meeting: Chair Shigemasa noted that they spoke about the Red Hill Fuel Storage system and the possible resolution to give Federal Aviation Administration (FAA) more power.

Mayor Kirk Caldwell’s Representative – Robert Kroning, Director of Design and Construction (DDC) was not present; the following memo was read for the record:

- Update on Salt Lake Waterfront Project: The DDC noted that the final design is on-going. The plans are being revised by design consultant to address review comments. The Environmental Assessment was published on Sunday, August 23, 2019. Director Kroning noted that they have received the money to start the process in the current fiscal year, Fiscal Year 2020. Director Kroning noted that a bid will be released to the community by late 2020.
- Salt Lake City Park Plan: The DDC reported that the contractor is currently mobilizing his work. The demolition of the old heat pumps is scheduled to begin during the 3rd week in September. The new heat pumps are expected to be in place an operational by the end of December 2019.
- Update on Salt Lake Waterway: The Department of Facility Maintenance met with Country Club Villages (CCV) representatives on Wednesday, August 28, 2019, to discuss the Honolulu Country Club (HCC) waterway. CCV said they noticed HCC using their amphibious equipment periodically to remove vegetation in the waterway. CCV expressed they would like to see increased use of the equipment. CCV’s Security Guard explained strong odor emanating from the waterway near CCV #6 with CCV #6 but no odor was detected. CCV allowed DFM to observe the waterway from the top of CCV #4 and pointed out an area that had vegetation that was preventing flow in the waterway. HCC has been asked to keep at least a narrow passageway clear while avoiding nesting Hawaiian Coots. DFM made a follow-up inspection of the waterway on August 30, 2019, and did not notice any odor. The Salt Lake Outfall Weir is clear and flowing. Samples of the fine green floating material covering the waterway near the banks of CCV were taken by the Storm Water Quality Branch (SWQ) and submitted to the University of Hawai’i (UH) for analysis. Professor Marek Kirs, a researcher for UH, identified the material to be the smallest flowering plant on Earth. It is closely related to the flowering plant Wolffia. It is not an alga, hence does not produce algal toxins. The next meeting with CCV will be scheduled near the end of September 2019.
- Ala Ilima Street and Ala Lili’koi Street: The Department of Transportation Services (DTS) will perform an investigation, which will include a site inspection, speed study, review of the traffic collision history, and take appropriate action as warranted by their analysis. DTS will contact the Board Member Dennis Egge if any additional information is required during their investigation.
Questions, comments, and concerns followed:

1. Daniel K. Inouye International Airport Signage: Baird noted that the airport signs are no longer informative and noted that this causes a backlog and traffic. Baird noted that the sign's font is not legible and asked that the font could be made bigger.

2. Salt Lake Boulevard and Pueloa Road: Pepper asked if Pueloa Road and Salt Lake Boulevard will be studied. Baird noted that he informed the City and County of Honolulu about the concern. Baird noted the proposed changes to the Pueloa Road intersection and stated that they Permitted Interaction Group (PIG) has made small changes to the Salt Lake roadways.

3. Electrical Vehicles: Chapman noted that electrical vehicle benefits will be ending in June 2020 and asked if there would be an extension to these benefits. Chapman noted that there is a need to work with private companies to create paid parking for electrical cars and stated that it could be mutually beneficial.

State Senator Glenn Wakai – Senator Wakai was not present; no report was given.

Representative Linda Ichiyama: Representative Linda Ichiyama was present and circulated a newsletter; the following report was given:

- Pedestrian Safety: Representative Ichiyama disseminated a handout about pedestrian safety to the committee.
- Cannabis (CBD) Exports: Representative Ichiyama noted that CBD extract and products are illegal if they are not properly regulated by the Food and Drug Administration (FDA). Representative Ichiyama noted that these products may have negative side effects and strongly recommended that residents stay away from CBD products until they are fully studied.

Questions and comments followed:

1. Cannabis (CBD) Exports: Omura noted that life insurance will not be given to people that use CBD and noted that it is against national Collegiate Athletic Association (NCAA) regulations.

2. Print HQ: Baird asked if the pedestrian safety handout comes in different languages and how the handout can be made available. Representative Ichiyama noted that the handout is from HPD.

3. Salt Lake District Park: Pepper asked if Salt Lake District Park could be utilized for future events.

4. Emergency Numbers: Omura asked if the Board could receive a handout with all the public safety number included.

Representative Aaron Ling Johnson – Christine Choe Kim, Representative Aaron Ling Johnson’s representative, was present and circulated a newsletter; she gave the following report:

- Phone Scams: The Department of Commerce and Consumer Affairs (DCCA) noted that there are phone scammers currently targeting licensed professionals. The DCCA asked that any suspicious calls be reported to them.
- Department of Labor and Industrial Relations (DLR): Representative Johnson was part of the DLIR Town Hall Committee that was designed to address questions regarding the optimization and modernization of the department, and collaboration with the legislature to ensure the progress in serving the community.

- Stadium Community Meeting: Kim noted that there will be a community meeting at Aloha Stadium on Wednesday, September 20, 2019. This is an attempt to garner community input on potential plans.

COMMUNITY UPDATES

HONOLULU AUTHORITY FOR RAIL TRANSPORTATION (HART) – Pat Lee from HART disseminated his reports to the Board:

Rail Project Update: HART and the City are working together to prepare for an initial opening of passenger service of the Honolulu rail system prior to launching full service by the end of 2025. The City’s Department of Transportation Services will be in charge of operating and maintaining the rail system along with the bus and the handivan. Introductory Service between the Kualakai Station (East Kapolei) and the Hālawa Station (Aloha Stadium) is targeted to start in late 2020. This would include nine stations from Kapolei near the Kroc Center, through Waipahu, Pearl City, Aiea, and include stops serving UH West Oahu, Leeward Community College, Pearlridge Mall and the Aloha Stadium. These nine (9) stations along the western portion of the rail alignment are nearly completed.

The Waikele station group in Kapolei is about 88% completed, the Farrington Highway station group through Waipahu is 95% complete, and the Kamehameha Highway stations through Pearl City and Aiea are 78% completed.

Besides the guideway and stations, rail also includes the Core systems which are the train cars, the automated communication and control systems which operate the trains and the stations, and the rail operations center and maintenance and storage facility, which is at 62% completion. These system components are being constructed, installed, tested and readied. HART is taking delivery of the fully automated train cars, which are being manufactured by Hitachi Rail and shipped from its final assembly plant in Pittsburg, California. The introductory passenger service will give HART and DTS staff and the general public the opportunity to get to know and learn the rail system. At the stations, their locations, the connections and amenities, access to the stations and boarding areas and how to ride and use the fully automated, driverless system. An expanded opening of rail service between the Kualakai Station (East Kapolei) to the Middle Street Station is targeted to begin by the end of 2023. This second opening would include service to the Pearl Harbor and the Daniel K. Inouye International Airport. Full Revenue Service of 21-mile, 21 station rail system to the Ala Moana Center station is scheduled to commence by the end of 2025. The Federal Transit Administration (FTA) has approved HART’s recovery plan. This clears the way for the FTA to release $744 million that is part of the City’s Full Funding Grant Agreement, once the P-3 contract is successfully awarded early next year for the City Center segment. The City Rate Commission is holding public hearings on the fares for bus and rail, and will consider such topics as whether fares will be flat rates or distance based rates, monthly and annual passes and which categories to offer, such as Adult, Youth, and Discounted eligible passes for Seniors, Disabled, Low Income, and what the appropriate fare would be for the interim period. The Rate Commission’s next meeting is on Tuesday, September 17, 2019 between 2:30PM and 4:30PM at the Mission Memorial meeting room, City Hall. The Commission will make their recommendations to the Mayor and the City Council who will decide on the fare structure.

Announcements:

1. Ulani Street will have lane closures from Chunho Street to Lagoon Drive later this month to install utility poles that will upgrade infrastructure in the area. A work notice flyer was sent to the board for your information. HART canvassed the businesses and establishments in the area to notify them of the work.

2. Beginning this week through mid-October, STO who is HART’s contractor building the guideway and stations between the Stadium and Middle Street, will require a closure of the far-right auxiliary lane of the H-1 Freeway Vaiwct 2A westbound at Elliot Street and Aolele Street. This closure will be in place daily between 9 AM to 5 AM the following morning. All other eastbound lanes and access to both lanes of the Airport Exit will remain open. This auxiliary lane closure of an approximate quarter-mile stretch of the H-1 Vaiwct is necessary to have the articulated gantry crane (the large yellow equipment you see from the freeway) safely install and secure overhead guideway segments adjacent to the freeway. The closure will not interrupt the flow of peak eastbound morning drive-time traffic, as it will not be in effect each day starting at 9 AM for a four-hour period. This closure may be required intermittently beyond this mid-October to mid-November as the articulated gantry moves toward the airport.

3. NANN is clearing the line of sight at the intersection of Salt Lake Boulevard and Kamehameha Highway which has been limiting right turns to Kamehameha in a westbound direction due to traffic safety concerns. The intersection is under the jurisdiction of the State Department of Transportation.

4. Road and Highway Builders is undertaking road widening, repaving of Kamehameha Highway and other improvements between Kaahili Street and Salt Lake Boulevard which will require lane closures for the safety of work crews and the travelling public. This work will go through late 2019.

Questions and comments followed:

1. Riley Street Methods: Omura asked about new road striping methods and Rosario noted that they are temporary. Rosario noted that they were just to define the current lanes and should not affect drivers.

2. Trip Duration: Pepper asked and Lee stated that the ride from Kapolei to Ala Moana would take 42 minutes.

Military:

Vicor Flint from Naval Facilities (NAVFAC) was present; the following report was given:

Arid HI Fuel Storage Project: Flint reported that there were no breaks or leaks at the fuel storage site. Flint noted that the water is safe and clean.

- Site Management Graduates: Flint reported that 100 apprentices recently graduated from the Pearl Harbor apprenticeship program and will be moving onto to be journeyman.

- Make-A-Wish Program: Flint noted that the Navy recently assisted in two (2) Make-A-Wish program wishes and stated that they were able to meet with Navy and Navy Seal personnel.

- Arizona Memorial: As of Sunday, September 1, 2019; the Arizona Memorial will be opening up. All the work done to the plant and landing area have been completed. Residents and tourists alike are welcomed to start visiting the memorial.

- Pearl Harbor Fish Ponds: Flint noted that the Navy is always looking for volunteers to assist in restoring the Pearl Harbor Fish Ponds.

Questions and comments followed:

1. Regional Flight Patterns: Baird asked about National Guard landing patterns being eliminated or limited due to noise concerns of the community. Flint asked about the flights and Baird stated that they may have
been F-22 Raptors. Flint noted that the Federal Aviation Administration (FAA) regulates their flights. Flint noted that while they are only three (3) percent of the flights that their section of the flights are loud. Flint noted the importance of having the Navy being visible practice. Flint asked that the community contact 473-2888 with any concerns.

2. Regional Repairs: Omura asked if the Navy has jurisdiction of the ditch on Arizona Road. Chair Shigemasa noted that he will contact Director Kroning to detail the affected region in order to find its jurisdiction. Omura asked about the repair of Caitlin Drive and stated that the region gets extremely muddy. Flint noted that the region has been repaved. Flint noted that Alamanu Elementary School may be charged with care for the region. Chair Shigemasa noted that no parties have taken responsibility for the region. Flint noted that safety for the region is of the utmost importance.

3. Army Report: Liana Kim was present; she reported that the Army will be giving a report at the October 2019 meeting.

Board of Water Supply (BWS) - Blaine Fergerstrom was present and circulated a written report; the following report was given:

- August 2019 Main Breaks: Fergerstrom reported that there was one (1) main break during August 2019 and noted that the pipe was made of polyvinyl chloride (PVC).
- General Water Announcements: Water Emergency Preparedness: Natural disasters, power outages, or other unexpected events can affect the BWS’s ability to provide water service to the community. September is National Preparedness Month, and serves as an important reminder to have an emergency preparedness kit available for your household. One (1) crucial component of your preparedness kit is a safe drinking water supply. Residents should store at least one (1) gallon of water per person per day for at least five (5) to seven (7) days. Also, in the event of an emergency, it is very important to stay tuned to media reports to receive water information bulletins and take any appropriate actions announced by the BWS or other emergency response agencies. More information about water emergency preparedness, including a how-to video demonstrating how best to store drinking water in your home, is available online at www.boardofwatersupply.com/emergencypreparedness. To receive emergency alerts via email or text message, consider subscribing to the BWS at HNL.info.
- General Water Announcements 2019-2020 Halawa Xeriscape Garden Workshop Schedule: The BWS and Friends of Halawa Xeriscape Garden continue to offer workshops. The xeriscape workshop schedule features new and popular workshops that offer useful tips on how to maintain a beautiful and water-efficient garden. These are on Wednesdays and Saturdays throughout the year. Workshops begin at 10:30 a.m. and advanced registration is required. Call 748-5215 or email workshops@hitals.org to reserve space. Visit our website www.boardofwatersupply.com to check out the full list of classes offered. The Halawa Xeriscape Garden remains open to the public on Wednesdays and Saturdays from 9:00 a.m. to 3:00 p.m. Residents are welcomed to drop by to see dozens of attractive and less-thirsty plants on display, as well as pick up a complimentary seed packet. Provided this is a flyer containing information about the current workshop schedule at the Halawa Xeriscape Garden. Upcoming workshops include:
  - Saturday, September 21, 2019: Backyard Composting Nature’s Recycling
  - Saturday, September 28, 2019: Fancy Funnels
  - Saturday, October 5, 2019: Economical Aquaponics
  - Saturday, October 12, 2019: Paint in the Garden: Bamboo

Schools – No representatives were present.

UNFINISHED BUSINESS/GOING PROJECTS
Salt Lake Watershed Stream Maintenance: Chair Shigemasa noted that the item was covered by the Mayor’s representative.

Intersection/crosswalk at Ala Napunani Street & Ala Ilima Street: Hearing no objections the item was deferred.

Salt Lake Boulevard Widening Project: Chair Shigemasa noted that the item was covered by the Mayor’s representative.

Salt Lake District Park Swimming Pool & Master Plan: Pepper asked that the Master Plan be discussed and Chair Shigemasa noted that importance of the topic.

NEW BUSINESS

AUA MANU SALT LAKE FOSTER VILLAGE NEIGHBORHOOD BOARD NO. 18
THURSDAY, SEPTEMBER 12, 2019
DRAFT REGULAR MEETING MINUTES
PAGE 7 OF 9

Salt Lake Ililikoi Street/Ala Ilima Street Intersection Alternative: Chair Shigemasa introduced the Board resolution to the community:
- Safety Alternatives: Chair Shigemasa noted that the intersection has had pedestrian flags installed as a stop-gap method.

Egg MOVED and Omura SECONDED the MOTION to SUPPORT the Board Resolution Requesting The City And County Of Honolulu Department Of Transportation Services To Adjust The Traffic Pattern And Establish A Left Turn Phase With Turn Signals At The Intersection Of Ala Ililikoi Street And Ala Ilima Street as WRITTEN.

Discussion followed: Resolution Verbiage: Pepper noted that the first whereas should not be included.

Egg MOVED and Omura SECONDED the MOTION to AMEND the Board Resolution to delete the first whereas statement.

Discussion followed: Public Safety: Omura noted that he was almost struck by a vehicle and stated that drivers cannot see the pedestrians.

The MOTION to AMEND the Board Resolution Requesting The City And County Of Honolulu Department Of Transportation Services To Adjust The Traffic Pattern And Establish A Left Turn Phase With Turn Signals At The Intersection Of Ala Ililikoi Street And Ala Ilima Street PASHD as AMENDED by UNANIMOUS CONSENT, (6-0-0). (Aye: Shigemasa, Kanemaru, Igawa, Chapman, Egg, Pepper, Bard, and Omura; Nay: None; Abstain: None.)

The MOTION to SUPPORT the Board Resolution for Requesting The City And County Of Honolulu Department Of Transportation Services To Adjust The Traffic Pattern And Establish A Left Turn Phase With Turn Signals At The Intersection Of Ala Ililikoi Street And Ala Ilima Street PASSED as AMENDED by UNANIMOUS CONSENT, (6-0-0). (Aye: Shigemasa, Kanemaru, Igawa, Chapman, Egg, Pepper, Bard, and Omura; Nay: None; Abstain: None.)

Ala Napunani Street Street Sweeping Extension with Parking Restriction: Pepper asked that the street sweeper services continue throughout the entire Salt Lake region.

Hearing no objections, the Agenda Item was deferred until the October 2019 Board Meeting.

Honolulu Bulk Item Collection Pilot Update: Omura noted that the pilot program has been a mixed success and has received criticism. Omura noted that any bulky items found illegally dumped on your property can lead to citation from the City and County of Honolulu without previous notice.

Hearing no objections, the Agenda Item will be added to the Unfinished Business/On-Going Projects.

Board Boundaries Revision Request to Commission: Hearing no objections, the Agenda Item was deferred until the October 2019 Board Meeting due to technical difficulties.

Resolutions Urging Mayor to Release NB 18 CIP Funds: Chair Shigemasa introduced the Board Resolution to the community.

Egg MOVED and Omura SECONDED the MOTION to SUPPORT the Board Resolution Urging The Mayor Of The City And County Of Honolulu To Release Capital Improvement Project Funding For Alamanu-Salt Lake-Foster Village Neighborhood Board No. 18.

Discussion followed: Appreciation: Chair Shigemasa thanked Councilmember Mahanan’s office for their work towards the allocation of funds during the budget process in the Capital Improvement Project bill.

The MOTION to SUPPORT the Board Resolution Urging The Mayor Of The City And County Of Honolulu To Release Capital Improvement Project Funding For Alamanu-Salt Lake-Foster Village Neighborhood Board No. 18 PASSED by UNANIMOUS CONSENT, (6-0-0). (Aye: Shigemasa, Kanemaru, Igawa, Chapman, Egg, Pepper, Bard, and Omura; Nay: None; Abstain: None.)

UNFINISHED BUSINESS/GOING PROJECTS:
CHAIR'S REPORT:
Chair Chace Shigemasa Quarterly Report: Chair Shigemasa noted that he will be giving a quarterly report to the community and disseminated his printed handouts to the community.

BOARD ASSIGNMENTS: Hearing no objections, Chair Shigemasa approved all changes to the Board Emphasis Leaders. All emphasis leaders can be found in the September 2019 Board Meeting Agenda.

BOARD PRIORITIES: Chair Shigemasa noted the importance of the Board Priorities while moving forward. Hearing no objection, the Salt Lake/Aliamanu/Foster Village Neighborhood Board No. 18 RETAINED their Board Priorities for the 2019-2021 Board Term, (9-0-0). (Aye: Shigemasa, Kanemaru, Iwaga, Chapman, Egge, Pepper, Bard, and Omura; Nay: None; Abstain: None.)

BOARD MEETING LOCATION UPDATE: Chair Shigemasa noted that he is working with the Salt Lake-Moanalua Public Library about the potential housing of the Salt Lake Neighborhood Board Meetings. Chair Shigemasa noted that the meeting room as never been used and noted his efforts to open the room for the community. Chair Shigemasa will continue to work on finding a potential new venue. Pepper noted that he specifically wanted to use the Salt Lake Public Library meeting room. Pepper noted his concerns about Board signage and Chair Shigemasa detailed his efforts to get multiple signs within the Salt Lake region. Pepper noted his willingness to assist in finding a new home.

TREASURER'S REPORT: Omura reported a remaining balance of $288.30.

ANNOUNCEMENTS
A. The next Aliamanu/Salt Lake/Foster Village Neighborhood Board No. 18 regular meeting will be held on Thursday, October 10, 2019 at 7:00 p.m. at Salt Lake Elementary School Cafeteria, 1131 Ali Liiiko Street.
B. Videotaped Board meetings are aired on ‘Olelo Channel 49 on the 4th Saturday of the month at 9:00 p.m.; and the 2nd and 4th Monday of the month at 7:00 a.m.

ADJOURNMENT: As there was no further business before the Neighborhood Board, Chair Shigemasa adjourned the meeting at 9:01 p.m.

Submitted by: Christopher Naylor, Neighborhood Board Assistant
Reviewed by: Harry Cho, Public Relations Officer
Final Review by: Chace Shigemasa, Chair

PUBLIC SAFETY REPORTS

Hawaiian Fire Department (HFD): Fire fighter Micah Waters was present; the following report was:

- September 2019 Statistics: There was one (1) structure fire, one (1) wildland/brush fire, three (3) nuisance fires, six (6) activated alarms, 122 medical emergencies, one (1) motor vehicle collision with a pedestrian, six (6) motor vehicle crashes/collisions, and one (1) mountain rescue.
- Safety Tip: Senior Citizen Safety: The HFD has the following guidelines for senior citizens, which will enable us to assist you during a medical emergency:
  - Always call 911 first for any emergency.
  - Have a list of medications and your medical history ready.
  - Know where your advanced directives are (Comfort Care only). Do Not Resuscitate, Physician Orders for Life-Sustaining Treatment, etc.
  - Do you live alone? Ensure there is adequate access to reach you.
  - Ensure your address is clearly marked and easy to see.

Hawaiian Police Department District 3 – Pearl City for Foster Village: - Sergeant Nitta reported the following:
- September 2019 Statistics: There were two (2) motor vehicle thefts, three (3) burglaries, 11 thefts, and four (4) Unauthorized Enterees into Motor Vehicles (UEMV). There were 319 calls for service in Foster Village. Statistical information can be found on the HPD public website, www.honolulu.pd.hawaii.gov.
- Safety Tip: Be sure to use safety reflector vests or devices on children’s costumes while trick or treating.
- Always use crosswalks and obey pedestrian traffic light signals.
- Safety Tip: HPD is asking the community to be diligent and careful for tampered candy.

Questions and comments followed:
1. Noise Pollution: Egge asked about noise pollution enforcement within Salt Lake and Sergeant Nitta noted that there are ordinances for loud mufflers and reconstructed vehicles. Sergeant Nitta noted that he does not have any statistics. Egge asked and Sergeant Nitta noted that it’s up to the officer’s discretion to give...
citations but noted that HPD does not have any decibel meters. Egge noted that HPD should look into getting a decibel.

2. **Ala Moana:** Pepper asked whom compiles the HPD’s monthly reports and Sergeant Nitta noted that the HPD’s Community Policing Division compiles the reports. Pepper asked and Sergeant Nitta noted that they should start getting the reports from the District Station or visit www.honolulupolice.org to get more information.

3. **Bicycles Safety:** Baird asked if there is a citation for riding a bicycle at night without a headlight and Sergeant Nitta noted that there is a citation for bicycles or vehicles that travel at night without headlights between the hours of darkness.

4. **Driving with High-beams:** Baird asked and Sergeant Nitta noted that it would be up to the officer’s discretion whether they wanted to cite drivers for driving with their high-beams on. Baird noted that drivers within Hawaii drive with their high-beams on with little regard for others.

Hawaii Police Department District 5 – (Kaihi for Salt Lake/Alamaks –) Lieutenant Ng reported the following:

- **September 2019 Statistics:** There were four (4) burglaries, six (6) motor vehicle thefts, 13 thefts, and 10 OSMFrs. There were 668 calls for service. Statistical information can be found on the HPD public website, www.honoluluapd.org.
- **Safety Tip:** Halloween Safety: Be careful of kiki during Halloween. HPD asked that children use flashlights and reflectors on their costumes. Please be careful of drivers and vehicles while trick or treating.

Questions and comments followed:

1. **Bicycle Safety:** Omura asked and Lieutenant Ng noted that no bicycles are allowed on sidewalks within Waikiki. Lieutenant Nitta noted that bicycles may be allowed to ride on sidewalks in more rural areas but noted that bicycles should yield to pedestrians on the sidewalk. Baird asked if bicyclists are getting cited for improperly riding their bikes and HPD noted that they impound any bicycle that is not registered until proof of purchase can be displayed.

2. **Noise Pollution:** Egge asked about the citing of loud vehicles and HPD noted that they use their discretion to cite loud vehicles for mufflers and sound systems.

**COMMUNITY EVENTS & CONCERNS**

- **Malama Moana:** Representatives from Malama Moana submitted their resolution to the Board and disseminated information about their opposition. Malama Moana is opposed to the installation of a playground due to the loss of already utilized picnic areas; the dog park due to the increase in risk of feces illnesses and bite hazards; the installation of perpendicular parking stalls due to the increased risk of traffic and accident, and the replenishment of sand with offshore sand due to them not being tested for contaminants. They asked that the Board entertain their resolution at the November 19 Board Meeting.

Questions and comments followed:

- **Stadium Update:** Pepper noted that the topic may not be relevant to the community. Baird agreed and stated that he is unsure about the resolution due to their Board’s boundaries. Pepper noted that the Chair designates if the item will be on the next agenda.

- **Parking Stalls:** Omura asked and Malama Moana noted that the proposed parking stalls are perpendicular.

**PRESENTATIONS**

- **New Arena Stadium Entertainment District (NASED):** Update. The following presentation was given:
  - **Stadium Update:** Deonte noted that their Wednesday, September 25, 2019 public scoping meeting was good for community input and stated that they have extended the public commenting period until Thursday, November 7, 2019. Watson noted that the Programmatic Environmental Impact Statement (EIS) has had its public commenting period extended for another 30 days and asked that the community send any comments to NASEDinfo@washingtonmoto.com or ‘NASED Comments’ at 1907 S. Beretania St. #400 Honolulu, HI 96814.

Questions and concerns followed:

- **Proposed Designs:** Baird noted his opposition to one of (1) the three (3) proposed stadium designs. Baird noted his opposition to onsite housing or there being a walking mall. Baird noted his opposition to the creation of more retail space just because the rail is present. Baird noted his opposition to a hotel onsite and noted the already high population density of the Salt Lake region. Portland noted her desire to have a museum onsite and stated it would be a great idea to showcase the Heroes of Hawaii. Portland stated that they could honor actors, politicians, and athletes. Portland noted that this would be a great way to create the story of producing wonder people and inventions in Hawaii. Watson noted that they are still within the public scoping period of the process and asked that the community submit their written testimony. Portland noted her countless hours of volunteering and stated that the community is expecting professionals to complete the task. Egge stated the possibility of having a parking structure due to comments made by Senator Waiakal. Chan noted their effort to revitalize the region and stated their want to be good neighbors in the future.

- **Use of Lower Lot:** Chair Shigemasa thanked them for not having any events within the lower parking lot.

- **Commenting Period:** Omura asked and Watson noted that the written commenting period was extended until Thursday, November 7, 2019. Watson noted that there will be another public scoping meeting for the extended commenting period. Chair Shigemasa asked that the community submit their comments before Thursday, November 7, 2019. Baird noted the importance of having community input on projects within their district.

Baird exited the meeting at 7:48 p.m.; five (5) members present.

**GOVERNMENT OFFICIAL REPORTS**

Mayor Kirk Caldwell’s Representative – Robert Koning, Director of Design and Construction (DDC), was present, the following report was given:

- **Meeting Attendance:** Director Koning was present at the July 2019 and September 2019 Board Meetings.
- **Update on Salt Lake Widening Project:** The DFC Final design is on-going. Consultant finalizing plans for resubmittal to agencies and utilities. Utility agreements sent to companies for review and comment.
- **Update on Salt Lake District Park Pool:** The DDC reported that the Contractor removed the old heat pumps. The new heat pumps were delivered to the site. The Contractor is working on installing the new heat pumps. The project is on track to be completed by the end of December.
- **Update on Salt Lake Waterway:** The Department of Facility Maintenance (DFM) met with Country Club Villages (CCV) representatives on Wednesday, September 25, 2019. Honolulu Country Club (HCC) maintenance was observed cutting down trees on the CCV side of the waterway fronting CCV, thus clearing the waterway of vegetation. CCV indicated that they are very appreciative of HCC’s work.
- **Update on Bulky Item Pilot Project:** Environmental Services (ENS) reported that the enhancements for this area in regards to the Bulky Item Pilot Project is for multi-unit buildings. Residents can now make individual appointments, once per month, for their unit, unless building management requires all residents of the building schedule appointments through its building resident manager. For questions clarification regarding Citations for illegally dumped material, please call 768-3200 and press three (3). Director Koning recommended the community to call Env for quicker responses.
- **Arizona Road:** DPM reported that the overgrown vegetation within the backed fenced area of Alamak Elementary School along Arizona Road is under the jurisdiction of the State DOE to maintain.
- **Salt Lake District Park Master Plan:** The Department of Parks and Recreation (DPR) thanked the Board for their suggestion and stated that they always review the current needs of the park (reparis, improvements, safety requirements) as well consider the needs of park users and consult the Master Plan when assessing future Capital Improvement Projects.
- **Salt Lake District Park Capital Improvement Projects (CIP):** The DPR noted that the CIP to replace the heaters at the Salt Lake swimming pool is under construction. The projected completion date is December 2019.

Baird rejoined the meeting at 7:51 p.m.; six (6) members present.

Questions and comments followed:

1. **Salt Lake District Park Pool:** Pepper asked about a follow up on the Salt Lake District Park Pool.

2. **Arizona Road:** Chair Shigemasa asked if Alamak Elementary School could be contacted and informed about their jurisdiction over the unmaintained median. Chair Shigemasa noted that it creates a safety concern for the surrounding community Omura noted that schools are part of the State and that State Representatives should be asked about this topic. Chair Shigemasa noted that it is City and County of Honolulu land that is utilized by the Department of Education (DOE).

3. **Salt Lake District Master Plan:** Chair Shigemasa noted the Board Resolution in regards to the releasing of previously allocated CIP funds and asked for a follow up. Director Koning noted that a Board liaison should work with DPR on the topic.
Salt Lake Boulevard Widening Project: Chair Shimemasu asked for an update on the funds for Salt Lake Boulevard. Director Kroning noted that the project is funded and being designed.

Councilmember Joy Manahan – Diana Schwering, Councilmember Manahan’s representative, circulated a newsletter and reported the following:

- **2019 Rail-Volition**: During September 2019, Councilmember Manahan attended the 2019 Rail-Volition in Vancouver, Canada. The event was meant for individuals to gain more knowledge on transit and community development. Councilmember Manahan was asked to speak and present at the conference to discuss Anti-Displacement Zones and Proactive Policies. Entailing transportation planning decisions that have significant and diverse equity impacts.

- **Climate Week New York City (NYC) 2019**: During September 2019, Councilmember Manahan was present at the Climate Week NYC. Alongside the summit, the United Nations General Assembly (UNGA) brings together international leaders from business sector, government, and civil society to showcase global climate action. At the UNGA, Councilmember Manahan represented the City and County of Honolulu and the island of Oahu at the UNGA on Climate Change.

- **Follow-Up**: Schwering disseminated a list of single-use plastic alternatives to the Board via email.

Questions and comments followed:

1. **Vehicle Registration**: Baird noted the need to license mopeds, bicycles, and skateboard riders on City and County of Honolulu Roads. Baird noted that tourists and locals are using bicycle services unsafely within Oahu and stated the need to create proper safety systems for bicyclists.

2. **Ali Lina Street and Ala Litho Street**: Omura asked about the community concerns about the crosswalk at Ali Lina Street and Ala Litho Street. Schwering noted that the Department of Transportation Services (DTS) is attempting to make the crosswalk safer. Chair Shimemasu noted that DTS is working on an alternative plan for the crosswalk. Baird noted that he has only received positive feedback about the removal of the previous crosswalk.

3. **Salt Lake Shopping Center**: Baird asked that the Salt Lake Shopping Center parking lot be studied due to them not being safe for drivers.

4. **Control Systems**: Egge noted that having designated turning signals would assist with keeping pedestrians safe and noted their previous installation within the region.

**Governor David Ige** is a Representative – Jo Ann Uchida Takeuchi, Deputy Director of the Department Commerce and Economic Affairs, was present and disseminated a handheld:

- **Affordable Housing**: Governor Ige plans to utilize an agricultural renaissance in order to change the current landscape of focusing on what we can grow in the islands to consume.

- **Follow-Up**: Daniel K. Inouye International Airport Signage: Deputy Director Takeuchi reported that the font size for the signs at the airport meet standards but noted that the Hawaii Department of Transportation (HDT) will be installing additional signage to properly inform drivers of highways.

- **Follow-Up**: Timing of Lights at Intersections: Deputy Director Takeuchi will report back on the timing of lights along Salt Lake Boulevard.

- **Electric Car Incentives**: Deputy Director Takeuchi noted that there are no plans for an extension of tax incentives for vehicles that charged these tax incentives are the best way to electrify our highways.

Questions, comments, and concerns followed:

1. **Arizona Road**: Chair Shimemasu noted that there is high grass within the median near Aliamanu Elementary School's back fence.

2. **Daniel K. Inouye International Airport**: Baird noted that the signs are unclear and need to be simplified. Omura noted that the airport is poorly rated within the nation. Chair Shimemasu asked that no significant changes be made to the signage until after the completion of the construction project. Baird noted that these are electronic billboards and are cost effective to change their message.

**State Senator Glenn Wakai** – Senator Wakai was not present; no report was given.

Representative Linda Ichiyama; Representative Linda Ichiyama was not present; no report was given.

**Representative Aaron Ling Johnson** – Representative Aaron Ling Johnson was present; he disseminated the Monthly Newsletter for himself, Representative Ichiyama, and Senator Wakai.

**HONOLULU Authority for Rapid Transportation (HART)** – Pat Lee from HART disseminated his report to the Board:

- **Rail Budget:** Omura asked about the intended budgeting of the rail system and if they will continue to cost the community in the future. Baird noted that the Western stations had changed the designs and agreed with Omura’s concerns.

- **Construction Update**: Baird asked if any stations are completed and Lee noted that some of the Western stations are near completion. Baird asked and Lee noted that the construction of the Aloha Stadium station should be completed in January 2020. Baird asked and Lee noted that the building would be completed but there would still need to be finishing touches done to the interior.

- **Project Contractors**: Baird noted that different contractors were used for the different sections of the project and asked if different contractors will be used for the completion of the project. Lee noted that the guideway and stations were broken up into different contracts in order to create a bidding process. Lee noted that the STG section of the project is reported to be on-time and on-budget.

**Navy**

- **Victor Flint** from Naval Facilities (NAVFAC) was present, the following report was given:

    - **Arizona Road**: Flint reported that the Navy has cleared the region and Chair Shimemasu detailed their current concerns with the jurisdiction of Arizona Road.
    - **Green Energy**: Flint noted that the Navy has met with local leaders to discuss future energy security and renewable energy resources.
    - **Red Hill Fuel Storage Project**: Flint reported that there will be a Red Hill Fuel Storage Open House on Tuesday, October 15, 2019 at the Oahu Veteran’s Center at 6:00 p.m. for refreshments. The Navy will have system operators present and an informational presentation for the community. Flint reported that there are currently no leaks in the area, no breaks, and that the water is clean and safe for the community.
    - **Pearl Harbor Fish Pond Clean Up**: Flint noted that the Navy hosted Kamehameha Schools on Tuesday, October 8, 2019 for a cleanup of the traditional Pearl Harbor fish pond. The Navy will be hosting a cleanup event for community members and will be accepting donations of fish for the fish pond.
with Radford High School on Wednesday, October 16, 2019. Flint noted that the Navy is always looking to partner with groups trying to volunteer for cleanups.

Amy: There was no representative present; no report was given.

Board of Water Supply (BWS) – No representative was present; the following report was read for the record:

- September 2019 Main Breaks: There was one (1) main break on Thursday, September 26, 2019 and made of polyvinyl chloride (PVC).
- Imagine a Day Without Water – Wednesday, October 23, 2019: The Board of Water Supply (BWS), City and County of Honolulu’s Department of Environmental Services (ENV), Facility Maintenance (DFM) and Office of Climate Change, Sustainability and Resiliency (Resilience Oahu) are working together to encourage Oahu residents to Imagine A Day Without Water on Wednesday, October 23, 2019. This one-day national observance aims to educate people about the importance of water in their lives and to raise awareness about the need to invest in water infrastructure. Join us from 11:00 a.m. to 1:00 p.m. at Tamarind Park or Kapiolani Hale. Visitors will play games, win prizes, and receive educational handouts. Participants can also visit our social media photo contest by posting a picture that illustrates A Day Without Water. The grand prize winner will select either a 30 or 55-gallon rain barrel or an unihort plant with a bag of Granulite Brand fertilizer and an eco-friendly basil planter. For more information about the event and photo contest, please visit the BWS’s website at www.boardofwatersupply.com or pick up a flyer before you leave this evening.

- Board of Water Supply Facilities Tour Program: The Board of Water Supply (BWS) offers public education programs to help the community understand and learn about our water resources. One of our outreach programs include “group tours” of the Halawa Xeriscape Garden (60 persons maximum) and Wahine’s Tunnel (30 persons maximum). The Halawa Xeriscape Garden is located in Halawa Valley’s Central Park Industrial Area and promotes outdoor water conservation. The Wahine’s Tunnel Tour will awaken your senses with a walk inside the 1,500-foot dike tunnel that provides water to Windward Oahu. These tours are scheduled to start on Sunday, December 15, 2019 and are available by appointment only. Please register by calling 808-749-5041 or email tours@hbws.org. Provided tonight is a handout containing information about the Board of Water Supply’s Facilities Tour Program.

Schools – No representatives were present.

NEW BUSINESS:

Board Boundaries Revision Request to the Commission: Chair Shigemasa introduced the resolution requesting that the Neighborhood Board Commission revise the Board boundaries for Neighborhood Boundaries No 18 and 19.

Eggí MOVED and Kanemaru SECONDED the resolution requesting that the Neighborhood Board Commission revise the Board boundaries for Neighborhood Boundaries No 18 and 19.

Discussion followed:

1. Board Boundaries: Baird noted the lack of a map included in the resolution and Chair Shigemasa noted that the boundaries are detailed within the resolution. Chair Shigemasa noted that their western boundary is Halawa stream. Baird noted that the area is largely industrially zoned and stated that this region should be considered AL- Large due to a low amount of residents. Eggí noted that the Board already comments on concerns in the region and stated that the Board would absorb the region. Eggí noted that the military housing residents will most likely not attend their meetings and stated his support of the resolution. Chair Shigemasa noted that Neighborhood Board District 19 has had difficulty creating their own Board and noted the need for that region to have Transit Oriented Development (TOD) plans proposed before a Board. Chair Shigemasa noted previous support to absorb the Mapunapauna region. Baird noted that Mapunapauna Stream was used as a border in the resolution but stated that the Board would have no control over any of the federal land within the region. Chair Shigemasa noted that the resolution was an attempt not to affect other Board’s boundaries. Baird asked why Elliot Street cannot be the border and Chair Shigemasa noted that it was an attempt to absorb the entirety of District 19.

2. Board Business: Pepper noted an inability to finish the current amount of Board Business and stated that the Board would absorb the Neighborhood Board No 19 district. Pepper noted his concerns with extending the length of their meetings due to representing a larger region. Pepper noted that this would lead to an increase in meeting size and length.

3. Public Private Partnership (P3) Housing: Flint noted that the housing in the region is from a P3 and can be used by civilians as well. Flint noted that these homeowners are taxpayers and deserve the protection of
their old Christmas trees due to them being fire hazards. Omura noted that fireworks cause many unneeded fires.

3. Statistics: Baird asked if their reports could be broken into different districts and HFD will report back.

Honolulu Police Department District 3 – (Pearl City for Foster Village) – Sergeant Nitta reported the following:
- October 2019 Statistics: There were four (4) motor vehicle thefts, three (3) burglaries, 21 thefts, and six (6) Unauthorized Entrance into Motor Vehicles (UEMV). There were 384 calls for service in the District.
- Safety Tip: – HFD asked that the drivers be aware of their surroundings and look for pedestrians near crosswalks.

Questions and comments followed: Fireworks: Omura asked about the excessive use of aerial fireworks and how the community could prevent it. Lieutenant Chang noted that there will be new laws that become effective on Wednesday, January 1, 2019 which would allow for HPD to cite homeowners that have people illegally using fireworks on their property. Omura asked if HFD could use drones to better monitor the region and HFD noted that they do not have drones. Baird noted that the fireworks in Foster Village all come from a few specific houses. Sergeant Nitta will report back. Pepper asked if there is any information about the fireworks distribution and HFD noted that there is no usable information.

Hawaii Police Department District 5 – (Kahaluu for Salt Lake/Aliamanu) – Lieutenant Chang reported the following:
- October 2019 Statistics: There were three (3) burglaries, seven (7) motor vehicle thefts, 11 thefts, and 16 UEMVs. There were 723 calls for service. Statistical information can be found on the HPD public website, www.honolulupd.org.

Questions and comments followed:
1. Statistics: Baird noted that other metropolitan Neighborhood Boards receive better detailed reports and asked how their Board could receive them. Lieutenant Chang noted that their reports are determined by previous agreements with the Neighborhood Boards and stated that more detailed statistics can be found at http://www.honolulupd.org/downloads/index.php?area=crimemapping. Pepper noted that their Board has been asking for more detailed reports for a while. Pepper asked and Lieutenant Chang noted that the reports were agreed upon by previous Boards. Pepper asked that the HPD Community Policing Team (CPT) works closely with the Board and community. Pepper asked for reports on closed cases and Lieutenant Chang noted that he is within the patrol and that this would not be within his jurisdiction. Baird asked about residents being able to read the reports without owning a computer and Lieutenant Chang stated that the community could use public libraries for this.
2. Fireworks: Omura noted that people are using illegal aerial bombs continuously throughout January 2018 and noted that the community could do to combat the concern. Lieutenant Chang noted that the community should call 911 stated that witnesses would be extremely helpful while citing people. Lieutenant Chang noted the City and County of Honolulu’s issues with citing illegal fireworks users. Omura noted that it normally only occurs once a night and stated that the community should call 911 to report these incidents.

COMMUNITY EVENTS & CONCERNS
- Climate Change: Pepper noted previous legislative efforts towards climate change and asked that the community get involved in any way possible.
- Ala Lilikoi Street and Ala Napanani Street: A resident thanked that Board for their efforts along Ala Lilikoi Street and Ala Napanani Street.
Questions and comments followed:

1. Senior Citizen: Iwaga asked and Johnson noted that there will be a different pass for senior citizens that takes the photo. Iwaga asked and Johnson noted that the HOLO card price for senior citizens should be comparable. Iwaga asked and Johnson noted that senior citizens are important to the transit system. Seeking noted that the senior citizen HOLO card costs $35.

2. Honolulu Rail System: Iwaga asked and Johnson noted that the rail system would only use the HOLO card. Johnson noted that residents will still be able to use money for the bus. Iwaga noted that the bus is more convenient for the community and Johnson noted that they are attempting to be more sustainable. Iwaga noted her concerns with the taxes and burdens placed upon the community. Baird asked and Johnson noted that the cards will cost between $22 and $5 dollars to replace. Johnson noted that this would be to replace the card and stated that the account would still hold the person’s account balance.

Hearing no objection, Chair Shigemasa moved to New Business: Ala Moana Beach Park Resolution.

NEW BUSINESS:

Ala Moana Beach Park Resolution: Chair Shigemasa introduced the resolution from Malama Moana.

Discussion followed:

1. Jurisdiction: Pepper noted that this resolution may be inappropriate due to it being out of their district and asked that the Board limit their discussion on the topic. Yomes thanked Malama Moana and noted that it would be a dangerous precedent to have resolutions for concerns outside of their district. Yomes noted that a Letter of Support would be better than a Resolution.

2. Malama Moana: Malama Moana noted that there are four (4) parts of the Environmental Impact Study (EIS) that they would like revisited: the dog park, the playground, the perpendicular parks, and the cost of the sand for contaminants. Malama Moana noted their concerns about the dog park as it does not meet previous dog park criteria, the playground not being more inclusive, the danger of having perpendicular parks, and the lack of testing for contaminants for the replenished sand. Malama Moana noted that there would need to be a large amount of trees removed for the parking stalls and stated that full size trucks would vastly exceed the allotted space for parking. Malama Moana noted that this project is a health and safety risk. Malama Moana stated that the City Council should re-evaluate these issues.

3. Parking: Vice Chair Chapman asked and Malama Moana noted that they would need to remove the curbing and sections of the grass to create parking. Malama Moana noted that the proposed parking would not work for a two (2) road way. Baird noted that trucks would need to block traffic in order to park and stated that diagonal or 45 degree parking could be used.

4. Roadway: Baird asked and Malama Moana noted that the road would be asphalt while the curbing would be concrete.

5. Sand Replacement: Omura asked why sand replenishment is brought up since we have already done a similar process. Omura noted that the tides have been affecting the shoreline. Lee noted that these sands were from natural means and noted that there are proposed plans to extend the shoreline into the ocean.

Yomes MOVED and Kanemaru SECONDED the MOTION that the Allamanu-Salt Lake Foster Village Neighborhood Board No. 18 write a Letter of Support for the Malama Moana Neighborhood Board No. 11’s Resolution that was Passed at their October 2019 Regular Meeting.

Discussion followed: Board Chair; Tam from Ala Moana Neighborhood Board No. 11 thanked Malama Moana for educating the Board on the issue. Chair Tam noted his Board’s previous support for the playground but stated that the community requested that these areas be revisited by the City Council. Pepper stated that the EIS was limited and noted his disappointment in the process. Pepper noted that he would abstain from the vote.

The MOTION that the Allamanu-Salt Lake Foster Village Neighborhood Board No. 18 write a Letter of Support for the Ala Moana Neighborhood Board No. 11’s Resolution that was Passed at their October 2019 Regular Meeting PASSED by ROLL CALL VOTE, (7-0-1). (Aye: Baird, Kanemaru, Chapman, Iwaga, Omura, Shigemasa, and Yomes; Nay: None; Abstain: Pepper.)
Governor David Ige’s Representative – Jo Ann Uchida Takeuchi, Deputy Director of the Department Commerce and Consumer Affairs, was present and the following report was given:

- **Follow-Up:** Alamanu Elementary School; Deputy Director Takeuchi stated that she will be investigating where the jurisdictional lines lay. Deputy Director Takeuchi and Chair Shimigama noted that the region has been cleared.
- **Follow-Up:** Daniel K. Inouye International Airport Signage; Deputy Director Takeuchi reported that they are currently attempting to find a solution for the airport’s signage.

Questions, comments, and concerns followed: Alamanu Elementary School; Yomtes noted that it takes time and effort for the Department of Education (DOE) workers to cut these regions. Yomtes noted that this region can be cleared by the military housing as a community project. Chair Shimigama noted that the military does not have jurisdiction and stated that the City and County of Honolulu and State control the region. Yomtes noted that he will attempt to work with the community on the project.

State Senator Glenn Wakai – Courtney Nomiyama, Senator Wakai’s representative, was present; the following report was given:

- **eSports:** Senator Wakai sees eSports gaining traction in Hawaii’s high schools and universities all of which could create economic opportunities. The Moanalua High School has just started its first eSports team with the assistance of Wolery and PC Gamer. While eSports is not a sanctioned sport in Hawaii, the Hawaii High School Athletic Association (HHSAA) recently got board approval to conduct two (2) eSports seasons this year in the fall and spring.
- **Radford High School Multipurpose Room:** The Radford High School’s multi-purpose room will now serve as the cornerstone of the school’s culinary program. The room’s final components will be installed during November 2019. The long-awaited multipurpose room is slated to be opened in January 2020.
- **Legislative Update:** Senator Wakai has requested that the community contact him at 586-8555 or semihana@ccaihawaii.gov with any legislative ideas for the upcoming session.

Questions and comments followed:

1. **eSports:** Vice Chair Chapman asked and Nomiyama noted that their goal would be to bring eSports tournaments to Hawaii. Vice Chair Chapman asked and Nomiyama noted that they would currently play Hawaii’s teams.
2. **Radford High School Development Project:** Pepper noted a project recently being delayed by 18 years has to be derailed due to a problem in the region. Pepper asked if the region will need continual monitoring in the future to ensure that the region is safe.
3. **Biola Estates:** Chair Shimigama noted the Board’s previous concerns about the illegal shipments of fireworks and the lack of proper testing on shipment containers. Pepper stated that this process should be halted at the transportation of the fireworks.

A new sports entertainment district (NASED) is under consideration by Hawai’i’s legislative leaders. Pepper asked if the region had a plan for the future. Pepper noted that the region had a plan for the future.

Representative Aaron Ling Johanson – Christine Choi, Representative Aaron Johanson’s representative, was present; the following report was given:

- **Loco tow: I 80:** Community is asked to contact Representative Johanson at (808) 586-9470 or via email at apphotchin@capitol.hawaii.gov.
- **Phishing Scams:** The community is being asked to be aware of phishing letters from the Department of Commerce and Consumer Affairs (DCCA) and the Office of Consumer Protection (OCP). These fraudulent emails are meant to deceive consumers through the use of DCCA letterheads and spoofed email account: “consumerreports@ccaihawaii.gov. The community is asked to be wary of these scams and be protective of their private information.

Red Hill Bulk Fuel Storage Facility Public Meeting: There will be a public meeting held on Tuesday, November 19, 2019 at Moanalua Middle School at 5:00 p.m. The Department of Health (DOH) and US Environmental Protection Agency (EPA) will be hosting the event to receive the Navy’s proposed plan to upgrade the underground storage tanks at the Red Hill Bulk Fuel Storage Facility.

- **17th Annual Menehune Classic:** Representative Johanson’s office has congratulated all the schools for their participation and performances during the 17th Annual Menehune Classic Marching Band Festival.

Questions and comments followed:

1. **Fireworks:** Pepper asked that all firework concerns from the community be taken to Senator Wakai.
Questions and comments followed:

1. Rail Budget: Pepper noted that the federal government is concerned with HART’s fiscal use and asked if it could be included within their report. Lee noted that he may not be able to divulge any information due to it being an open investigation.

2. Traffic Concerns: Omura noted community concerns about the work on Kaonohi Street causing traffic in the region. Omura noted that this intersection can take up to 30 minutes to traverse. Rosario noted that they will be adding a third lane to the region in hopes of mitigating traffic but stated that this cannot be done until the regional roadwork is completed.

New: Victor Flint from Naval Facilities (NAV FAC) was present, the following was reported:

- Salt Lake: Flint disseminated historical photos of Salt Lake to the Board.
- Moda: Flint noted that Midway, a movie that was filmed at Pearl Harbor and around Oahu, opened in theaters on Friday, November 8, 2019.
- Pearl Harbor Fish Pond Clean Up: Flint noted that the Navy is currently going through the restoration process for Pu’u oia and stated that the Navy is always looking for volunteers.
- Navy Landfill: Flint noted that he had previously disseminated information on the old Navy Landfill.

Arizona Road: Flint reported that the Navy has cleared the region and Chair Shigemasa detailed their current concerns with the jurisdiction of Arizona Road.

Aina: Flint noted that the Navy has met with local leaders to discuss future energy security and renewable energy resources.

Red Hill Fuel Storage Project: Flint reported that they were at the Red Hill Fuel Storage Open House on Tuesday, October 15, 2019. Flint noted that there will be an Environmental Protection Agency (EPA) and Department of Health (DOH) meeting. Flint stated that the Navy is regulated by the EPA for this project. Flint noted that the Navy facility is located a distance away from the BW3’s Halawa shafts. Flint noted that there are only 10 days’ worth of fuel and stated that this could cause future disaster. Flint noted that no fuel equates no power. Flint noted that the system uses gravity pumps which do not need power and stated that these reserves are within the City and County of Honolulu emergency plans. Flint noted that there have been no breaks or leaks; stated that the Navy has met all regulations set forward by the Agreement of Consent.

Yomes exited the meeting at 9:00 p.m.; seven (7) members present.

Questions and comments followed:

1. Navy Landfill: Pepper noted his appreciation for the land fill information and asked if the region would need continual monitoring. Flint noted that they have properly removed and tested the affected soil from the region. Flint noted that they have rebuilt the field.

2. EPA Meeting: Omura asked and Flint noted that they will be attending the EPA meeting on Tuesday, November 19, 2019.

Aina: There was no representative present; no report was given.

Board of Water Supply (BWS) – Blaine Fergerstrom was present; the following report was read for the record:

- October 2019 Main Breaks: There were no main breaks in the region for the month of October 2019.
- Water Meter Servicing: A BWS contractor will be changing out meter transponder units in customer water meter over the next year. Beginning in January 2020. Customers will be notified of the regional work one (1) to two (2) weeks prior. If customers have any concerns, please contact BWS at contactus@bws.com.
- Public Meeting: Fergerstrom noted that there will be a public meeting at Moanalua High School on Tuesday, November 19, 2019 to garner community input and comments on the Navy’s proposed plans.
- BW3’s Calendars: Fergerstrom noted that the annual BW3’s Calendars for 2020 are available to the community.

Questions and comments followed:

- Budget: Baird asked if the annual advertising budget for BWS could be reported at their January 2020 meeting.

Schools – No representatives were present.

NEW BUSINESS:

- Ala Moana Park Street Sweeping Extension with Parking Restriction: Hearing no objections, the topic was deferred indefinitely.
- Homeless Encampment near Kapiolani Street: Hearing no objections, the topic was deferred until the Board’s January 2020 Meeting. Pepper asked and Chair Shigemasa that the encampment is near Halawa Stream.

FINISHED BUSINESS GOING PROJECTS:

- Salt Lake Boulevard Widening Project: The item was addressed via memo.
- Salt Lake District Park Swimming Pool & Master Plan: The item was addressed via memo.
- Salt Lake Waterway Stream Maintenance: The item was addressed via memo.
Adopted Board Boundaries Revision Request to Commission Update Chair Shigemasu noted that he will inform the Board when the item is upon the Neighborhood Commission’s Agenda. New Aloha Stadium Entertainment District (NASED) Update: Report was previously given.

Honolulu Bulky Item Collection Pilot Update: Hearing no objections, the item was deferred until January 2020.

CHAIR’S REPORT: Chair Shigemasu reported that there will be a public meeting on Wednesday, November 20, 2019 from 2:30 p.m. until 4:00 p.m. at Mission Memorial. The meeting is in regards to tour companies making recreational stops at City and County of Honolulu parks.

TREASURER’S REPORT: Omura reported an expenditure of $28.47 in October 2019 and a remaining balance of $204.29.

Board Reports:
A. Alamanu Elementary School: Chair Shigemasu noted that Yones and Kanemaru will be the point of contacts for the Alamanu Elementary School concerns.
B. Legislative Session: Omura noted that there is only one (1) bill currently being considered.

ANNOUNCEMENTS:
A. The next Alamanu/Salt Lake/Foster Village Neighborhood Board No. 18 regular meeting will be recessed in December 2020. Chair Shigemasu noted that the January 2020 Neighborhood Board Meeting may be moved to the Salt Lake Public Library meeting room.
B. Videotaped Board meetings are aired on ‘Olelo Channel 49 on the 4th Saturday of the month at 9:00 a.m.; and the 2nd and 4th Friday of the month at 7:00 a.m.

ADJOURNMENT: As there was no further business before the Neighborhood Board, Chair Shigemasu adjourned the meeting at 9:12 p.m.

Submitted by: Christopher Naylon, Neighborhood Board Assistant
Reviewed by: Harry Cho, Public Relations Officer
Final Review by: John Cho, Neighborhood Board Assistant

PUBLIC SAFETY REPORTS
Honolulu Fire Department (HFD): Acting Captain Paul Otto was present; the following report was given:

• December 2019 Statistics: There were two (2) structure fires, one (1) nuisance fire, two (2) cooking fires, 14 activated alarms, 116 medical emergencies, two (2) motor vehicle collisions with a pedestrians, three (3) motor vehicle crashes/collisions, and four (4) mountain rescues.

• Safety Tip: Senior Fall Prevention: Exercising regularly will help build strength and improve balance and coordination. Take your time getting out of a chair, and be aware of your surroundings. Keep stairs and walking areas clear and well lit. Improve the lighting in and outside your home. Use nonslip mats in the bathtub and on shower floors to increase safety. Be aware of uneven surfaces, such as rugs and other trip hazards. Wear sturdy, well-fitting shoes, and replace them as soon as they show signs of excessive wear.

Questions and comments followed: Fireworks: Omura asked if there were any reports of firework fires. HFD noted that there were no fires created by fireworks reported.

Hearing no objections, Chair Shigemasu moved to Agenda Item: Honolulu Authority for Rapid Transportation (HART):

Honolulu Authority for Rapid Transportation (HART) – Pat Lee was present; the following report was given:

• Rail Update: The final leg of the current rail alignment, the City Center segment which includes 4.1 miles of guideway structure and 8 stations from Middle Street to Ala Moana Center is planned to be awarded as by a public private partnership (P-3), contract by summer. The $1.4B contract would also include the Pearl Highlands parking structure and transit center and the operations and maintenance contract for the rail system for a period of up to 30 years. Meanwhile, the utility relocation work in the City Center will proceed with Dillingham Boulevard the immediate focus with both day and night time work to come. This accelerated schedule for the utility relocation and building the guideway and stations could shave off 18...
Hearing no objections, Chair Shigemasu returned to Agenda Item: Honolulu Police Department District 3.

Honolulu Police Department District 3 – (Pearl City for Foster Village) – Sergeant Sakai reported the following:

- **District Captain:** Captain Ferraris introduced himself to the community.

- **December 2019 Statistics:** There was one (1) motor vehicle theft, three (3) burglaries, 12 thefts, and 18 unauthorized Entries into Motor Vehicles (UEIV). There were 472 calls for service in the District. Statistical information can be found on the HPD public website, www.honolulu pd.org.

- **Seasonal Theft:** Sergeant Sakai noted that the amount of theft rises during the holiday seasons and asked the community to remain vigilant.

- **Safety Tip:** HPD asked that pedestrians be safe while walking or running at night. HPD asked that the community wear bright or light-colored clothes while walking or jogging. HPD asked that the community wear reflective materials for safety.

Questions and comments followed:

- **Driving with High Beam Headlights:** Baird asked and HPD stated that it is illegal to drive with your high beam headlights on while there are oncoming drivers nearby.

Honolulu Police Department District 5 – (Kailhi for Salt Lake/Alamanu) – Lieutenant Ng reported the following:

- **December 2019 Statistics:** There were three (3) burglaries, four (4) motor vehicle thefts, 15 thefts, and 12 UEIVs. There were 875 calls for service. Statistical information can be found on the HPD public website, www.honolulu pd.org.

- **Chinese New Year:** HPD asked that the community be aware of the Chinese New Year on Saturday, January 25, 2020.

Questions and comments followed:

1. **Salt Lake Shopping Center:** Omura asked if Salt Lake Shopping center has been more active for crime and Lieutenant Ng noted that HPD patrols these areas during the holiday season.

2. **Fireworks:** Omura asked and Lieutenant Ng noted that new laws make it easier to cite individuals that use illegal fireworks.

3. **Broken Traffic Lights:** Baird asked and Lieutenant Ng noted that downed or broken traffic lights should be treated as four (4) way stops.

4. **Noise Mitigation:** Egge asked how loud vehicles could be cited and Lieutenant Ng noted that he would need to investigate the new parameters for the law.

5. **Thefts:** Omura asked about the recent thefts in the region and Lieutenant Ng stated that he cannot speak on active cases. Omura asked and Lieutenant Ng noted his belief that the kupuna should be escorted to their appointments and errands for their safety.

COM rITY EVENTS & CONCERNS:

- **Illegal Fireworks:** Pepper noted that recent illegal aerial firework use has become tremendous and stated that unenforceable laws should be removed.

- **Public Speaking Groups:** A resident noted that he is attempting to create a public speaking organization for children and invited the community to work with him. Chair Shigemasu noted the importance of helping the children and stated that they will add the topic to a future agenda.

PRESENTATIONS:

City and County of Honolulu – Draft Environmental Impact Statement (EIS) for the Honolulu/Waipahu/Pearl City Wastewater Conveyance Facilities (Department of Environmental Services (ENV)): Rae Loui from AECOM was present; the following report was given:

- **Public Comment Period:** Loui noted that the public comment period for the Draft Environmental Impact Statement for the Honolulu/Waipahu/Pearl City Wastewater Conveyance Facilities ends on Monday, February 24, 2020 and asked for the community to submit their responses.

- **Draft EIS Details:** The Honolulu sewer basin is the second largest sewer basin on Oahu. It serves approximately one-third of the island’s population and includes approximately 103,400 acres (about 27% of the island). Loui noted that the EIS is programmatic to allow overview before a specific environmental assessment (EA) is completed. The Proposed Action includes replacement, upgrades, and rehabilitation of wastewater pump stations (WWPSS), force mains, and trunk sewers to increase the capacity and rehabilitate the existing conveyance options and three (3) Waiawa conveyance options are evaluated in
the draft EIS. Loui noted that there is a Halawa force main within the region that would need to be addressed. Please contact cns@hawaiicounty.gov for more information.

Questions and comments followed: Public Comments: Pepper asked how the comments should be targeted and Loui noted that the comments should be aimed at reducing concerns within the community about the project.

GOVERNMENT OFFICIAL REPORTS

Mayor Kirk Caldwell’s Representative – No representative was present; the following memo was read for the record:

- Update on Salt Lake Widering Project: The DDC noted that final design is on-going. City coordinating Engineer Tui Nav-ele and State Engineer with the Hawaii State Department of Transportation (HSDOT). Baid noted that HSDOT is reviewing the project plans for resubmission to the State of Hawaii DOT and (Federal Highway Administration) FHWA.
- Update on Salt Lake District Park Pool: The DDC reported that the heat pumps were made operational at the end of November 2019 and are working. The pre-final inspection and training for DPR staff was scheduled for Friday, December 6, 2019.
- Update on Salt Lake Waterway: The Division of Road Maintenance (DRM) staff met with Country Club Villages (CCV) representatives on Wednesday, December 4, 2019, to discuss and conduct visual inspection of the Honolulu Country Club (HCC) waterways. Both HCC and CCV has been doing very good work on removing the vegetation from the stream banks. HCC has been doing good work clearing the stream banks on some of the CCV side and their side of the waterway of overgrown vegetation. CCV has done very good work on the CCV side of the waterway by removing the overgrown vegetation on the stream banks. Some of the areas where the vegetation was removed by CCV has provided very good scenic views of the golf course. Alamanu Crater and the Koolau Mountains. CCV has been concerned with the overgrowth leading to the outlet weir. DRM informed the CCV staff, that DRM inspected the outlet weir previously on Wednesday, November 27, 2019, and observed the weir to be clear and functioning properly. DRM will continue to meet with CCV at a next meeting to be scheduled in Tuesday, January 7, 2020.
- Pu’umalu Community Park Improvements: The Department of Parks and Recreation (DPR) reported its no report for the upcoming week. DPR always reviews the current needs of the park, with the priorities usually being repairs, improvements, safety requirements, etc. We also consider the needs of park users, the budget, and consult the Master Plan, among other things, as we consider future Capital Improvement Projects.

Councilmember Joey Manahan – Radiant Cordero, Councilmember Manahan’s representative, circulated a newsletter and reported the following:

- Salt Lake Boulevard Widering Project: Cordero noted that the Salt Lake Boulevard Widering Project is slated to begin on Saturday, March 20, 2021.
- Regional Park Updates: The Salt Lake District Park Walkway to Ala Pu’umalu Community Park plan is under review by a consultant. The rockfall mitigation project has been approved to proceed in February 2020. The Hoa Aloha Park improvement project is awaiting DPR approval and has had funds allocated for the project.
- Air Rifle: On Wednesday, December 11, 2019, Councilmember Manahan attended the Moanalua High School winter assembly to honor the Moanalua Boys Air Rifle Team for winning the Hawaii High School Athletic Association (HHSAA) Championship.

Questions and comments followed:

1. Park Updates: Pepper noted that the park improvement plans being under review is unacceptable and requested that a more concrete date be given. Baid noted that Ala Moana Beach Park has marshals that assist with the rules but stated that they need the jurisdiction to properly enforce the rules. Chair Shigemasa thanked Councilmember Manahan for his assistance with the regional parks and Cordero stated that she will follow up.
2. Vehicle Noise: Egge asked about the need for Reconstruction (RECON) Vehicle Inspections to assist with the enforcement of noisy vehicles. Egge noted that the City Council should amend their laws to coincide with the State’s decibel level laws. Pepper agreed with Egge’s sentiment and stated the need to remove laws and signage that is unenforceable. Pepper noted that some new laws for speeding may be unenforceable.
3. Vehicle Registration: Baird asked if they can look into laws to regulate electrical and gas powered bikes, scooters, and electric skateboards. Department of Education, Department of Transportation and Hawaii Department of Transportation (HDO). Baird stated that these new vehicles are dangerous due to their speed.
4. Single-Use Plastic Ban: Chapman asked if there will be phases to the new single-use plastic ban. Cordero noted that the ban on plastic utensils will begin in 2021 with all single-use plastic being banned in 2022.
5. Department of Transportation Services (DTS): Chair Shigemasa asked if DTS could attend their next Regular Board Meeting.

Hearing no objections, Chair Shigemasa moved to Board Agenda Topic: State Senator Glenn Wakai:

State Senator Glenn Wakai – Karen Dang, Senator Wakai’s representative, was present; the following report was given:

- Radford High School Multipurpose Room: The Radford High School’s multi-purpose room just had its new furniture and floor implanted. The multi-purpose room is slated to be opened in February 2020.
- Moanalua High School Theater: The 35 million dollar Moanalua High School Theater is scheduled to be completed during summer 2020.

Questions and comments followed:

1. Regional School Funding: Pepper noted the disparity between the funds allocated to Radford High School compared to Moanalua High School. Dang noted their attempts to allocate funds to Radford High School.
3. State Housing: Egge asked about the State housing project being opened at 2907 Ali Ilima Street.

Hearing no objections, Chair Shigemasa returned to Board Agenda Topic: Governor David Ige’s Representative:

Governor David Ige’s Representative – Jade Butay, Director of Hawaii Department of Transportation (HDT), was present and stated the following report was given:

- More Sustainable Hawaii: Governor Ige and his team is focusing to create a sustainable Hawai’i moving forward. Director Butay noted efforts to save coral, sustain water rights, and growing local agriculture.
- Hawaii Credit Rating: Director Butay noted that the State’s credit rating has been upgraded from AA to AAA, based on the State’s resilient economy and continued strong performance. Director Butay noted that this means that Hawai’i taxpayers may have potentially saved millions of dollars on interest payments.
- Follow-Up: Daniel K. Inouye International Airport Signage: Director Butay noted that HDOT is still accessing the option to change the permanent airport signage until after the completion of all the regional projects.
- Follow-Up: Fireworks Ban: Director Butay noted that 99 percent of the items within Hawai’i are imported and stated that only a statewide ban would be effective.

Questions, comments, and concerns followed:

1. Homelessness: Omura noted that Hawai’i is now ranked second for homelessness within the United States and stated that the improvement has been good.
2. Sustainability: Pepper asked and Director Butay noted that the new affordable housing would assist with sustainability. Pepper asked for a climate change and sustainability update from the state. Director Butay noted HDOT’s efforts to use more energy efficient solutions. Pepper noted the need to find immediate solutions for sustainability.
3. Fireworks: A resident noted that x-rays could be used to inspect imported items, similar to the Texas-Mexico border. Yomes noted that the issue would continue to occur without statewide bans. Yomes stated that the neighborhood-islands have different laws which allow for illegal shipping of fireworks between islands.

Representative Aaron Ling Johanson – Christine Choi, Representative Aaron Ling Johanson’s representative, was present; the following report was given:
Legislative Opening Day: Choi noted that the 2020 Legislative session will open on Wednesday, January 16, 2020.

Legislation Tracking: Choi asked that the community visit the Capitol website (https://www.capitol.hawaii.gov/login/login.aspx) in order to track any legislation.

Hickam High School Media Center: Choi reported that the Moanalua High School Media Center is expected to be completed in 2020 and stated that the project is within its final phase of a multi-step project that included a band room, rehearsal space, and a choral classroom.

New Aloha Stadium Entertainment District (NASED): Choi thanked the community for their participation in the NASED community meetings and master plan process.

Legislative Aide: Choi introduced Shanda Delos Reyes to the community.

Questions and comments followed:
1. Committee Meeting: Chapman asked whom decides which House of Representative Committee Meetings are broadcasted and Choi noted that the committee chairs decide which meetings are broadcasted on Oeloa. Chapman asked and Choi noted that there is no specific way to request that the committee meetings are broadcasted.
2. Department of Education (DOE) Facilities: Omura asked if DOE tracks are exclusive to students and a resident noted that the school grounds are locked due to safety concerns.

Representative Linda Ichiyama: Debra Pratt, Representative Linda Ichiyama’s representative, was present; the following report was given:
- Candidate Mail: Pratt noted that Representative Ichiyama is Vice Chair of the Consumer Protection and Commerce Committee and will be a member of the Economic Development, Business and Labor and Public Employment committees.
- Public Access Room (PAR): Pratt noted that the PAR manages the posting of meetings on Oeloa.

COMMUNITY UPDATES:
New Aloha Stadium Entertainment District (NASED) Update: Chris Kinimaka gave the following report:
- Update: Kinimaka noted their meetings with community groups to address their concerns. Kinimaka disseminated a frequently asked question (FAQ) sheet to the community and asked that the community visit their website (http://nased.hawaii.gov) for more information.

Questions and comments followed:
1. Salt Lake Boulevard Widening Project: Yommes asked if Salt Lake Boulevard widening project and Kinimaka noted their meetings with HU61 and D15 in attempts to improve the roadway. Yommes noted that they have been waiting 30 years for Salt Lake Boulevard Widening Project and stated his opposition to NASED preceding the widening project. Baird noted that the proposed 2018 start date for the Salt Lake Boulevard Widening Project and stated that noting has occurred.
2. Emergency Services: Baird noted that more emergency systems could be implemented in the Salt Lake region surrounding the stadium.
3. Noise Mitigation: Baird noted concerns with noise mitigation of the project during construction and stated that the noise from the region travels into the community. Chair Shigemasa noted the time period for the setup and Andrews stated that sites near the community cannot begin setup for the swap meet 6:00 a.m. Chair Shigemasa noted the community’s appreciation of the later time period.
4. Traffic Mitigation: Egge noted that he has heard community concerns about traffic mitigation and Kinimaka stated that she has heard these complaints.
5. Abandoned Vehicle Storage: Egge noted that the stadium parking lot can be used to store abandoned vehicles.
6. Project Phases: Pepper asked and Kinimaka noted that Phase 1 will include some improvements to the community. Kinimaka noted that there would be commercial shops within Phase 1. Pepper asked and Kinimaka noted attempts to build more than a stadium with the allocated funds.
7. Opposition: Baird noted his opposition to homeless services or new affordable housing within the region and stated his desire to keep the stadium a park. Baird noted that there is adequate retail space in the region. Chair Shigemasa thanked Kinimaka for her report.

Naval: Victor Flint from Naval Facilities (NAVFAC) was present, the following report was given:
- Arizona Road Baptist Church: Flint disseminated pictures of the old Arizona Road Baptist Church to the Board.

Red Hill Fuel Storage Project: Flint reported that Monday, January 6, 2020 was the deadline to submit testimony for the Red Hill Fuel Storage Project’s commenting period. Flint reported that there are no leaks or breaks in the system and that the water is clean.

Sentry of Aloha: Ending on Wednesday, January 22, 2020, Sentry Aloha is hosting on-going training out of the Pacific Air Force base. They will be the F-22 Raptors during their exercises.

Chamber of Commerce: Flint reported that the Chamber of Commerce held a meeting on Thursday, January 9, 2020 and stated that the Navy was in attendance.

Questions and comments followed:
1. Red Hill Fuel Storage Project: Baird asked and Flint noted that the site has 20 12.5 million gallon tanks. Baird noted that some of the tanks are not in use. Pepper asked how many above ground storage units would be needed to replace the system. Flint noted that the tanks are a modern marvel that have never failed except for human error. Flint stated that the system is constantly up kept and repaired. Baird noted the immense amount of land needed to replace the current system with an above ground system. Flint noted proposed above-ground systems that would be more susceptible to attacks and natural disasters. Baird noted that the Red Hill Fuel Storage System is within the City and County of Honolulu’s Emergency Disaster Plan. Flint stated that no fuel equals no power. Chair Shigemasa asked and Flint noted that their water pumps are clean and safe.

2. Aliamanu Elementary School: Yommes asked what was previously located at the Aliamanu Elementary School site.
3. Water Safety: Chair asked and Flint stated that the Navy has their water wells checked for safety by a third party per their agreements.

Army: No representative was present; no report was given.

Board of Water Supply (BWS) – Blaine Fergenstrom was present; the following report was read for the record:
- Main Breaks: There were no main breaks to report.
- General Water Announcements: Meter Equipment Replacement Project: The BWS has contracted Royal Contracting Company to replace meter transponder units in water meter boxes across Oahu. The BWS has been gradually replacing them and, when finished, this project will increase the efficiency of automated meter reading process: notifying area customers one (1) to two (2) weeks prior to the work; for meter boxes on private property, arranging with the customers in advance to access the box; at the meter box, exchanging the old device for a new one (1), about a 15 to 20 minutes per meter, perform quality assurance/quality control work to ensure transponders are operating correctly. Work will be done seven (7) days a week from 7:30 a.m. until 10:30 p.m., except on state highways where work is allowed only from 7:30 a.m. until 3:30 p.m. Information about this project will be posted on BWS’s website and social media. No customer shall be asked for any type of payment by any BWS employee or contractor for this project. If customers spot suspicious activity or have questions about the project, they can contact BWS via phone at (808) 748-6500, between 7:45 a.m. until 10:30 p.m., or via email at contactus@bwswa.org, between 7:45 p.m. until 4:30 p.m. Monday through Friday.
- Budget Update: Chair Pahinui, from the North Shore Neighborhood Board No. 27, reported the BWS budget. In Fiscal Year 2019, BWS had a line item for $300,000 in advertising. These funds were spent on water conservation and plant sales advertising. BWS had one (1) line item for Red Hill Fuel Storage System at $1,000 quarterly. Chair Pahinui noted that this was for notices for newspapers if there planned to do work on a well. Chair Pahinui noted that they have sent out two (2) flyers in 2015 and 2019 in regards to the Red Hill Fuel Storage System and stated that this cost $22,000 each.

Questions and comments followed:
1. Budget: Baird asked why BWS advertises on TV when they have a monopoly. Chair Pahinui noted that the BWS commercials are for water conservation and their plant sales.
2. Recognition: Chair Pahinui thanked Egge for his work within the community in filing water use complaints.
3. Stream Pollution: Yommes asked about BWS polluting the streams. Chair Pahinui stated that they received a notice of violation in regards to releasing slurry into Nuu’uanu streams and noted that this concerns is being managed by their lawyers.

Schools – No representatives were present.
NEW BUSINESS:
Ala Napuani Street-Sweeping Extension with Parking Restriction & Stormwater Drains and Salt Lake Waterways: Chair Shigemasa noted that Agenda Topic 8A and 8B are related due to the stormwater drains emptying into the Salt Lake waterways. Chair Shigemasa noted that proper street sweeping could assist with the cleaning of Salt Lake drains and waterways. Chair Shigemasa noted that the drains within the Salt Lake region do not have drain covers or nets. Omura agreed with Chair Shigemasa and stated community concerns about debris entering the drainage system due to poor maintenance.

Egge MOVED and Omura SECONDED the MOTION to request that the Department of Facility Maintenance (DFM) permanently street sweep the entirety of Ala Napuani Street from the freeway; that the Department of Transportation Services (DTS) will implement No Parking signs during street sweeping periods.

Discussion followed:
1. Tow-Away Zones: Yomes asked if they are attempting to implement a tow-away zone for this project.
Ocura asked and Omura noted that his concerns were with the illegally parked cars that do not move. Pepper noted that signage could assist with the illegal parking concern. Baird asked and Chair Shigemasa noted that there are similar systems along Ala Ilima Street. Omura noted that he has not seen any tow trucks and Yomes stated that they cannot tow any vehicles due to a lack of signage during the project.
2. Project Expansion: Pepper noted that the project was a pilot program and stated that he believes that the program could be expanded.

The MOTION to request that the Department of Facility Maintenance (DFM) permanently street sweep the entirety of Ala Napuani Street from the freeway; that the Department of Transportation Services (DTS) will implement No Parking signs during street sweeping periods PASSED BY UNANIMOUS CONSENT, (8-0-0). (Aye: Shigemasa, Omura, Kanemaru, Pepper, Baird, Yomes, Chapman, and Egge; Nay: None; Abstain: None.)

3. Drain System Maintenance: Baird asked and Chair Shigemasa noted that a more extensive conversation can be held in the future in accordance with Sunshine Law. Chair Shigemasa noted his attempts to make an all-encompassing motion for drain water care and Yomes agreed.

Pepper MOVED and Egge SECONDED the MOTION that the stormwater drains along Ala Napuani Street are covered by mesh. Hearing no objections, the MOTION PASSED BY UNANIMOUS CONSENT, (8-0-0). (Aye: Shigemasa, Omura, Kanemaru, Pepper, Baird, Yomes, Chapman, and Egge; Nay: None; Abstain: None.)

Homeless Encampment near Kahuaani Street: Hearing no objections, the Agenda topic was deferred.

UNFINISHED BUSINESS/ON-GOING PROJECTS:
Salt Lake Boulevard Widening Project: The item was addressed via memo.
Salt Lake District Park Swimming Pool & Master Plan: The item was addressed via memo.
Salt Lake Waterway Stream Maintenance: The item was addressed via memo.
Neighborhood Board Transportation Initiatives Update: No report was given.
Adopted Board Boundaries Revision Request to Commission Update Chair Shigemasa noted that the request has been sent to the commission and asked that the online mailing group receive a notification of the Commission’s public hearing.

View Aloha Stadium Entertainment District (NASED) Update: Report was previously given.

Honolulu Bulky Item Collection Pilot Update: Baird asked that the topic is added to a future agenda. Yomes noted that the Middle Street refuse system needs to be able to receive more items in order to manage the community’s garbage needs. Egge noted that the DFM will pick up items that are reported.
Questions and comments followed: Driver Regulations: Baird asked if drivers making right turn at a stoplight are required to stay within the first available lane. HPD agreed. Honolulu Police Department District 5 – (Kalaki for Salt Lake/Alemanu) – Lieutenant Ng reported the following:

- **January 2020 Statistics:** There were two (2) burglaries, eight (8) motor vehicle thefts, three (3) thefts, and six (6) UEMVs. There were 646 calls for service. Statistical information can be found on the HPD public website, www.honolulu.gov/911.
- **Safety Tip:** Lieutenant Ng asked that drivers pull over for emergency personnel and stated that failure to pullover may lead to a citation.

Questions and comments followed: Driving Regulations: Baird asked and HPD noted that vehicles should not cross double-solid lines, unless there is an emergency. Pepper asked and HPD noted that drivers should pull over to the right side of the road in case of emergencies.

**COMMUNITY EVENTS & CONCERNS**

- **Red Hill Fuel Storage Facility:** Omura noted an article in regards to Red Hill Fuel Storage Facility and asked that the Red Hill Fuel Storage Facility be added to a future agenda. Baird asked that Flint be allowed to comment on the topic.

**PRESENTATIONS**

State of Hawai’i Department of Transportation (HDOIT) - H201 Restriping Project: T. Lee, Administrative Service Officer, was present; the following report was given:

- **Project Update:** Lee reported that there will be closures along H201 due to restriping near the Pu’u Ola Road off-ramp. More information about the closures can be found online (https://hdoit.hawaii.gov/highway/work/pahu). The project will have spot reconstruction, sign replacement, pavement repair, drain clearance, and possible vegetation replacement. Lee noted that the project is scheduled for work Monday through Saturday, however the project may work on Sundays to remain on schedule.

Questions and comments followed:

1. **Project Details:** Baird asked and Lee noted that the project is still within the planning phase. Lee noted that the bidding process may begin before the planning process is completed. Baird asked and Lee noted that the project will begin after design is complete. Baird asked and Lee noted that the bidding process is for the project contractor. Chair Shigemasa noted previous suggestions for delineators along the proposed project near the Pu’u Ola Road off-ramp. Lee noted that the delineators could be included within the project and will follow up. Omura asked for details about the project contractor and schedule. Omura noted concerns with road closures not related to roadwork. Lee will report back. Chair Shigemasa asked that the residents living in the surrounding areas be informed of the project and Lee noted that they will receive mail-outs about the project. Baird asked that Lee attend their March 2020 Regular Meeting.

2. **Tripler Army Medical Center:** Baird asked if Tripler Army Medical Center has been informed about the off-ramp closures and Lee will report back.

City and County of Honolulu Department of Transportation Services (DTS) – Bus Routes for Interim Rail Service: Abelaye was present; the following report was given:

- **Service Update:** Abelaye reported that there will only be minor changes to bus routes in order for them to connect to regional rail stations. Abelaye noted that there will be a new bus route that will travel from Aloha Stadium to Ala Moana.

Questions and comments followed: **Bus Routes:** Baird asked and Abelaye noted that there will be informational sheets that will be disseminated to the community. Abelaye noted that DTS will be reaching out to the affected Neighborhood Board districts in the future. Omura asked about circuit shuttles and Abelaye noted that there will be no major changes made during the interim service. Omura asked and Abelaye noted that circuit shuttles are not planned for interim service.
ALAMANUSALT LAKE/FOSTER VILLAGE NEIGHBORHOOD BOARD NO. 18
THURSDAY, FEBRUARY 13, 2020
DRAFT REGULAR MEETING MINUTES
PAGE 3 OF 8

COMMUNITY UPDATES

New Aloha Stadium Entertainment District (NASED) Update: Watson was present; the following presentation was given:

- Update: Watson noted the extensive process to create a draft Transient Oriented Development (TOT) which is part of the NASED project. Watson noted that there were extended community meetings with the community over the last few years. Watson stated that their last meeting was in January 2020 and noted that no TOT plans were presented. Watson noted community concerns about parking and stated the importance of the swap-meet. Watson noted that the swap-meet is within their future plans. Watson stated that the draft Environmental Impact Study (EIS) and Master Plan will be completed soon and available to the community.

Questions and comments followed:

1. Project Details: Baird noted that the community is opposed to hotels on the property. Watson noted that stakeholders did not bring up the hotel during their meetings and stated that everything is still being considered. Baird asked about possible college campuses and Watson noted that she has not heard of plans for a school campus. Pepper noted his opposition to the project until the community’s concerns are properly considered. Watson noted that they have been considering the community’s concerns on traffic and noise mitigation. Pepper believed that the project is being rushed and stated that regional infrastructure is the main concern. Watson noted attempts to balance the infrastructure needs of the community and Pepper noted that infrastructure is more pivotal than the stadium.

2. Salt Lake Boulevard Widening Project: Yomes noted that Mayor Caldwell has not done anything about Salt Lake Boulevard and stated that the project has been forgotten. Yomes noted that the Board must halt NASED and HART projects to get their needs completed. Baird asked if there has been conversation with the City and County of Honolulu in order to complete the Salt Lake Boulevard Widening Project. Baird noted the potential traffic concerns of the community and jurisdictional issues. Watson noted that she will report back and will attempt to engender conversation of the project. Baird noted a special meeting in regards to Salt Lake Boulevard Widening Project where the Board was present and a resolution passing by 2017. Yomes stated a need to protest in order to get their point across and stated that the project will not be completed. Chair Shigemasa noted that the project is still funded by the Transportation Improvement Project (TIP).

Hono Authority for Rapid Transportation (HART) – Pat Lee was present; the following report was given:

- Rail Update: The full 20-mile, 21 station rail system is over 53% complete. Most of this is on the west side. The Maintenance and Storage Facility in Waipahu is 100% completed. The rail stations in your area (Vaiaawa (Pearl Highlands) is 94% complete, Kalauoa (Peartridge) is 91% complete and Halaia (Aloha Stadium) is 85% complete. Kamehameha Highway resurfacing is 90% completed. HART and the City are working together to prepare for an initial opening of passenger service of the Honolulu rail system prior to launching full service. Train and system testing continues, and HART is working with DTS and the HDOT on the safety certification and service reliability requirements in preparation for passenger service. HART’s job is to design, build, test, and certify the rail system to get it ready for revenue passenger service. HART staff is preparing for operational readiness in system integration testing, pre-revenue operations, management capacity and capability, and safety certification, all to get the trains, stations and facilities “ready to ride.” The City’s DTS will be in charge of operating and maintaining the rail system along with the bus and the handivan. A smart card swiping system, the HOLO card will be utilized and needed to ride the train. No cash ticketing will be available so everyone would need a HOLO card to ride. Riders will get to the stations by bus or Handivan connections, walking, riding a bike, taxi or ride share, being dropped off at the stations, or utilize one of the planned park and ride lots along the route. There will be four (4) new bus training centers at the Keoneo station (UH West Oahu), the Ho’olei station (West Loch), Waiawa station (Pearl Highlands), and Halaia station (Aloha Stadium).

- Poster Contest: The annual HART Poster Contest is underway, and it is open to all Oahu high school students in 9th to 12th grades attending public, charter, private or home school. Posters are due on Friday, March 13, 2020.

- Shimmick Taylor Granits (STG): STG reported that the left turn at Halawa Drive and Arizona Street will be closed from 5:00 p.m. to 7:00 a.m. from Monday, March 2, 2020 through Monday, February 24, 2020. Kamehameha Highway between Kalaoa Street and Kohuma Street will be closed overnight from 8:00 p.m. to 5:00 a.m. from Monday, February 24, 2020 through Friday, February 28, 2020. Also, STG will hold their business and community meeting on Tuesday, February 18, from 10:30 a.m. to 11:30 a.m. at the Hawaii Employers Council building, 2682 Waiawi Loop.

- Contact Information: For more information, please visit the HART website at www.honolulutransit.org; you can call the project hotline at 566-2299 or email a question to info@honolulutransit.org.

Questions and comments followed:


2. Honolulu Rail System: Omura asked and noted that the Honolulu Rail System will be a cashless system. Omura asked and Lee noted that there will be security cameras and gates for security. Omura noted concerns with vandalism occurring during the evening. Omura asked and Lee noted that there will be security gates to secure the stations after 12:00 a.m. Omura asked and Lee noted that there will be emergency call boxes along the rail system. Omura asked and Lee noted that there will be staff monitoring the rail system.

3. State Support: Yomes noted his previous support of the project and asked that Governor Ige support the completion of the Salt Lake Boulevard Widening Project.

Navy: No representative was present; no report was given.

Army: No representative was present; no report was given.

Board of Water Supply (BWS) – Blaine Fengerstrom was present; the following report was read for the record:

- Main Breaks: There were no main breaks to report for January 2020.
- Correction: Kathleen Pahnriu was presenting at the January 2020 Regular Meeting as the Public Information Officer for BWS.
- Detect-A-Leak Week (Monday, March 16, 2020 through Sunday, March 22, 2020): Preserving and protecting our most essential resource – our water – is everyone’s responsibility. As part of our Detect-A-Leak Week (Monday, March 16, 2020 through Sunday, March 22, 2020) message, The Board of Water Supply (BWS) encourages residents to be smart water users by checking for leaks on their property as well as in fixtures and to repair them promptly. Checking and repairing leaks helps save water, lowers your water bill, and prevents potential damage to your home. During Detect-A-Leak Week, free toilet leak detection dye tablets will be available to the public during that week at the BWS Public Service Building at 630 South Beretania Street, at all Satellite City Halls, and Hardware Hawaii locations. For more leak detection information, please visit www.boardofwatersupply.com or call 748-5041.

- Water Conservation Week Poster and Poetry Contest: The BWS is excited to launch its 42nd annual Water Conservation Week Poster Contest and 12th annual Poetry Contest. For 2020, the contest theme, “Creating a Sustainable Water Future,” invites Oahu students to creatively express the importance of conserving water now to preserve our water supply for the future. The poster contest is open to Oahu students in grades Kindergarten through Sixth, and the poetry contest is open to Oahu students in grades Seventh through Twelfth. The deadline to enter these contests is Wednesday, February 26, 2020 – winners will be announced in May 2020 and will receive prizes and be featured in our 2021 Water Conservation calendar.

Questions and comments followed:

1. Storm Water Utility: Baird asked about storm water relief and BWS noted the Storm Water Branch manages 18,000 catchments. BWS noted previous conversations about the billing and noted that they have no input on the billing or legislation. Baird asked that the topic be added to a future agenda. Kanemaru noted that they should contact the Department of Facility Maintenance (DFM).

2. Leak Detection: Omura noted the poor condition of buildings within Salt Lake and asked about the leak detection process. Fengerstrom detailed the process for using leak detection tablets.

Schools – No representative was present.

Government Agencies:

- Deputy Director Tim Houghton, Department of Environmental Services (ENV) was present; the following report was given:
  - Bulky Item Pilot Project: Deputy Director Houghton reported an uplift in tonnage collected and appointments leading into the holiday season. Deputy Director Houghton noted that many tons of pickup were previously related to illegal dumping. Deputy Director Houghton reported an uplift in refuse drop-off centers and stated that white-goods appointments have been stable. Deputy Director Houghton noted that manual overtime costs have lowered when compared to 2019 and stated that the project is still within its pilot phase.
Questions and comments followed: Pilot Project; Baird asked and Deputy Director Houghton noted that the pilot project will be continuing. Baird noted community concerns with the pilot project process. Deputy Director Houghton asked if there were any additional concerns. Omura noted that the pilot project is doing well to deter from illegal dumping. Pepper noted that this is not a pilot project and stated his concerns with illegal dumping. Pepper asked and Deputy Director Houghton noted that there is a survey to collect community concerns. Kanemaru noted concerns about illegal dumping and stated her concerns with the projects slow process. Kanemaru noted that the condo users have while using the system. Yomes noted his opposition to the project and stated that the Ke‘ehi Transfer Station could handle the dumping process. Yomes noted that the illegal dumping legislation is an unenforceable process.

Hearing no objections, Chair Shimemasa returned to Agenda Topic: Navy.

Navy: Victor Flint from Naval Facilities (NAVFAC) was present, the following report was given:
- Red Hill Fuel Storage Project: Flint reported that there are no leaks or breaks in the system and that the water is clean and safe. PNR noted that the tanks have not failed and that they follow Federal regulations.
- Tours: Flint noted that there are tours available for the USS Pribble Destroyer at Pearl Harbor and asked that the community contact him for details.

Questions and comments followed: Red Hill Fuel Storage Project: Omura asked if Flint could attend their March 2020 meeting to speak about current Red Hill Fuel Storage Project legislation. Flint stated that he will attempt to get subject matter personnel to attend.

Hearing no objections, Chair Shimemasa returned to Agenda Topic: Government Official Reports.

GOVERNMENT OFFICIAL REPORTS

Governor David Ige’s Representative – Jo Ann Uchida Takeuchi, Department of Commerce and Consumer Affairs (DCCA); was present and the following report was given:
- Capital Connection: Governor Ige’s monthly Capital Connection can be found at https://governor.hawaii.gov/subscribe/.
- Legislative Session: There has been historic joint-legislation made which would assist with raising the minimum wage, reduce the cost of childcare, and create more affordable housing.
- Novel Coronavirus: Uchida Takeuchi asked that the community get their flu shot to minimize the confusion between the flu and the Novel Coronavirus. Uchida Takeuchi asked that the community stay home if they are sick. More information about the Novel Coronavirus can be found at https://health.hawaii.gov/doc/adv/directory/novel-coronavirus-2019/.
- Department of Commerce and Consumer Affairs (DCCA); Uchida Takeuchi reminded the community to not click on suspicious links and asked that the community be aware of phone calls from scammers.

Questions and comments followed: Novel Coronavirus: Pepper asked if there are plans to allow Lieutenant Governor Green to head the programs for the Novel Coronavirus. Uchida Takeuchi noted Lieutenant Governor Green’s work with the Department of Health (DOH).

State Senator Glenn Wakai – Senator Wakai was present; the following presentation was given:
- Aliamanu Middle School: Senator Wakai noted that Aliamanu Middle School will be installing a canopy over Building E to give the students protection from the rain.
- Hawaii Elementary School: Senator Wakai noted that Hickam Elementary School has had their $7 million interactive technology system opened.
- Ali Ilima Street State Housing: Senator Wakai noted that the public housing at 2607 Ali Ilima Street is not ready to be opened and stated that housing could potentially open in March 2020.
- Aloha Stadium: Senator Wakai noted bills to reinvent the Aloha Stadium region and add members from the Aiea and Salt Lake community to the Aloha Stadium Authority Board.

Questions and comments followed:

1. Aliamanu Middle School: Yomes noted his concerns with traffic due to Salt Lake Boulevard not being improved and stated that Salt Lake Boulevard Widening Project is a priority before the NASED. Senator Wakai noted that

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Salt Lake Boulevard is a City and County of Honolulu road and stated that funds have been allocated for the widening project. Senator Wakai noted that the NASED will not break ground until 2023.

2. Red Hill Fuel Storage System: Omura asked about legislation in regards to the Red Hill Fuel Storage System and Senator Wakai noted that they will be voting on the topic soon. Senator Wakai noted that he will vote in favor of the bill.

3. Air Conditioning (A/C) Units: Senator Wakai noted the numerous schools in the region that do not have A/C units in their classrooms.

4. Town Hall: Senator Wakai noted that he will have a Town Hall Meeting on Thursday, March 5, 2020 at Salt Lake Elementary School from 6:00 p.m.

Representative Aaron Ling Johnson – Shandra Delos Reyes, Representative Aaron Ling Johnson’s representative, was present; the following report was given:
- House Bill (HB) 2217: HB 2217 aims to increase resident involvement in the Stadium Authority decision making process. This bill adds a resident of Foster Village, Crosspointe, or Ali’i Plantation to the Stadium Authority.
- Secondary Student Conference: On Friday, January 24, 2020, Representative Johnson met with Radford High School student at the Secondary Student Conference. It is a (2) day opportunity where students learn about the legislative process, interact with State Representatives and Senators, and research and debate on bills related to education.
- HB 2220: HB 2220 addresses the increase in financial exploitation of elders and establishes the offense of financial exploitation of an elder as either a misdemeanor or a felony depending on the value exploited.
- HB 2519: Delos Reyes noted that the HB 2519, in regards to minimum wage increase and low-income tax relief, has been deferred by committee.

Representative Linda Ichiyama: Debra Pratt, Representative Linda Ichiyama’s representative, was present; the following report was given:
- Town Hall Meeting: Pratt reported that Representative Ichiyama will have a Town Hall Meeting on Thursday, March 5, 2020 at Salt Lake Elementary School from 6:00 p.m.

Mayor Kirk Caldwell’s Representative – Director Jim Howe, Honolulu Emergency Services Department, was present; the following report was given:
- Joint Management Center (JMC): Director Howe noted that all 911 calls and information comes from the JMC. Director Howe noted that the JMC has all State and City and County of Honolulu communication on all transportation services.
- Salt Lake Boulevard: Director Howe noted that the CIP would be able to detail whether Salt Lake Boulevard Widening Project funds have been released.
- Update on Salt Lake Widening Project: The Department of Design and Construction (DDC) reported that final design plans will be resubmitted to HDOT and FHWA shortly. The project does not have adequate local funds in the proposed FY 2021 Capitol Improvement Project (CIP) budget to advertise for bids in 2021-2022.
- Update on Salt Lake District Park Pool: The DDC reported that pre-final inspection and training for Department of Parks and Recreation (DPR) staff were held on Friday, December 6, 2019. The project is substantially complete.
- Update on Salt Lake Waterway: The Department of Facility Maintenance (DFM) staff met with Country Club Villages (CCS) representative on January 22, 2020, to discuss and conduct visual inspection of the Honolulu Country Club (HCC) waterways. Both HCC and CCV continue with their work removing vegetation from the stream bank of the waterway. CCV is concerned HCC has not continued work in the waterway leading to the outlet weir. That section of the waterway adjacent to CCV Phase 1 has a number of trees with large overhangs into the waterway. DRM informed the CCV staff that the outlet weir was last inspected on December 30, 2019, and was observed to be clear and functioning properly. DRM will continue to meet with CCV and has scheduled the next meeting in February 2020.
- No Crosswalk Signage: The DFM reported that Permanent No Crossing sign/posts were installed at Ali Napunani Street and Ali Ilima Street on July 23, 2019, pursuant to DTS Legal Paint and Sign Work Order. A DTS work order has been prepared requesting the temporary signs be removed. The DTS will conduct a site assessment for the installation of a permanent No Crosswalk sign at the intersection of Ali Napunani Street and Ali Ilima Street.
- Ali Napunani Street Sweeping: Street sweeping equipment regularly services the Salt Lake area including Ali Napunani Street. However, parked cars prevent street sweeping equipment from effectively...
cleaning the parking lane and curb area. In the past, the neighborhood board supported parking restrictions that allowed Regular Street sweeping of the parking lane on Liliuokalani Street. Should the Neighborhood Board follow the previous procedures in initiating parking restrictions, Ala Napunani Street can be effectively cleaned with weekly street sweeping.

- **Ala Napunani Street Drain Covers:** DFM’s Storm Water Quality (SWQ) Branch is currently working with a contractor to have automatic retractable screens (ARS) installed in the majority of catch basins along Ala Napunani Street. Included with this proposal are ARSs installed in catch basins along Ala Liliokoi, Liliuokalani and Ala Liliu Street. The actual start date has not been finalized but anticipate that work will begin by mid-2020.

- **District 2 Park:** The DPR is asking for Pepper to state which park in District II is of concern. West Honolulu District II encompasses all park properties from Makiki through Aiea, ending at Aiea High School. The manned parks within the Neighborhood Board Region 18 are currently staffed with full time, permanent Recreation Directors.

- **Road Studies:** DTS requests clarification of these generalized recent studies i.e., specific streets, projects, or planning studies in the Salt Lake area.

- **Bus Routes:** DTS was present; a report was given.

- **Illegal Fireworks:** Corporal Feato, District 5 Community Policing Team (CPT) attempted to contact Omura but was unsuccessful.

Questions and comments followed:
1. **No Crosswalk Signage:** Yones noted the need to place a permanent barrier at the intersection of Ala Napunani and Ala Liliu Street in order to deter jaywalking.
2. **Sinkhole:** Baird noted a sinkhole fronting Navy Hale Keiki School on Bougainville Drive. Chair Shigemasa noted that Director Bubay could address the concern. Baird noted the poor condition of the area.
3. **Street Sweeping:** Omura asked about street sweeping along Ala Napunani Street and Chair Shigemasa will follow up.
4. **Novel Coronavirus:** Director Howe noted that the City and County of Honolulu has been monitoring the Novel Coronavirus and stated that they have no confirmed cases as of noon Thursday, February 13, 2020.

Councilmember Joey Manahan – Anela Keko’olani, Councilmember Manahan’s representative, circulated a newsletter and reported the following:
- **Illegal Dumping:** Keko’olani noted their efforts with the ENV to clean up illegal dumping in the region.
- **Storm Water Utility:** Keko’olani noted that the Storm Water Utility is a Federal Mandate and stated that there will be community meetings upcoming. Please visit https://www.honolulu.gov/dfw for more information.

Questions and comments followed:
1. **Storm Water Utility:** Baird asked and Keko’olani noted that they only have proposed meeting locations.
2. **Salt Lake Boulevard Project:** Omura asked that the Salt Lake Boulevard Project is started.

**NEW BUSINESS:**

House Bill (HB) 2217/Senate Bill (SB) 3166 – Related to the Stadium Authority (Board Resolution): Chair Shigemasa noted the bills submitted by Senator Wakai and stated that the Board has submitted testimony.

Baird MOVED and Omura SECONDED the MOTION to SUPPORT the Board Resolution Related to HB 2217 and SB 3166 (Stadium Authority).

Discussion followed: **Opposition:** Yones noted that he will not support the motion until after Salt Lake Boulevard Widening Project begins. Omura agreed. Chair Shigemasa noted the bills language which would allow for community members to be trustees on the Board.

**The MOTION to SUPPORT the Board Resolution Related to HB 2217 and SB 3166 (Stadium Authority) PASSED by QUORUM VOTE, (5-1-0).** (Aye: Shigemasa, Kanemaru, Baird, Pepper, and Omura; Nay: Yones; Abstain: None.)

Ala Liliokoi Street/Ala Liliu Street Intersection Follow Up & Action: Hearing no objections, the Agenda Item was deferred.
REGULAR MEETING MINUTES
MONDAY, SEPTEMBER 9, 2019
AIEA PUBLIC LIBRARY PROGRAM ROOM

CALL TO ORDER: Chair Bill Clark called the meeting to order at 7:31 p.m.; quorum was established with 14 members present. Note - This 15 member Board requires eight (8) members to establish quorum and to take official Board action.


Members Absent: None.

Guests: Representative Aaron Ling Johanson, Representative Romy Cachola, Representative Sam Kong; Linda Rund (Senator Breen Harimoto’s Office), April Cobretti (Councilmember Elfant’s Office), Councilmember Carol Fukunaga; Shirley Temple and Radiant Cordero (Councilmember Joye Manahan’s Office), Lieutenant Okagawa and Sergeant Sakai (Honolulu Police Department); Firefighter Sanja Du Prisss (Honolulu Fire Department); Tracy Burgo (Board of Water Supply); Pat Lee, Johnny Reid (Hawaii Authority for Rapid Transit); Jason Taynos (Nan Inc.), Danny Rosana (Road & Highway Builders LLC); Clare Yamamoto (Aiea Community Association - ACA), Scott Unow, (aiea island), Lona Kimekawa, Joseph Kaing, and Lavai Liepina (Department of Accounting and General Services); Victor Flint (NAVFA); Katie Stephens (Architects Hawaii Limited), Phil Acosta (Aiea Bridge), Chilul Park, Brent Fujimoto (Jesus Baptist Hawaii Church), Kaela Cheng (Wilson Okamoto Corporation), Tere Micharian (Architects Hawaii Limited), John Mohamara (Commercial), Patrick Watson, (aiea island) (honda Consulting), Luther Tsyu, Mary Yonemura, Sarah Thompson, Charlene Yamashiro, (Residents); and Christopher Neylon (Neighborhood Commission Office). Note: Name was not included if not legible or on the guest attendance sheet.

FILLING OF VACANCY: There were no volunteers for the Sub-District 1 Vacancy.

BOARD RECESS SCHEDULE: Wood MOVED and Sugimura SECONDED the motion to recess in November 2019 and meet during December 2019. The MOTION PASSED by UNANIMOUS CONSENT, (14-0-0). (Aye: Sugimura, Arakaki, Fatafehi, Wood, Fitch, Kimball, Tuij, Beekman, Clark, Whitfield, Dwyer, Mizusawa, Moriwaki, and Imamura-Urús; Nay: None; Abstain: None.)

CITY MONTHLY REPORTS:
Honolulu Fire Department (HFD): Firefighter Du Prisss gave the following report:
- Arakil 2019 Statistics: There were 80 fires, 2 active fires (no fires), 71 medical emergencies, 1 motor vehicle collision with pedestrian, 81 motor vehicle crashes/collisions, and 2 hazardous materials incidents.
- Safety Tip: Senior Citizen Safety: The HFD has the following guidelines for senior citizens, which will enable us to assist you during a medical emergency:
  o Have a list of medications and your medical history ready.
  o Know where your emergency contacts are (Comfort Care only: Do Not Resuscitate, Physician Orders for Life-Sustaining Treatment, etc.).
  o Do you live alone? Ensure there is adequate access to reach you.
  o Ensure your address is clearly marked and easy to see.
Honolulu Police Department (HPD): Sergeant Sakai gave the following report:
- July 2019 Statistics: There were 14 motor vehicle thefts, 15 burglaries, 34 thefts, 22 unauthorized entry of motor vehicles (UEMV), and 5,833 total calls for service.
- August 2019 Statistics: There were 16 motor vehicle thefts, 12 burglaries, 34 thefts, 23 unauthorized entry of motor vehicles (UEMV), and 5,848 total calls for service.

Board of Water Supply (BWS): Tracy Burgo congratulated the Board for winning their elections and reported the following:
- July 2019 Main Breaks Report: There was one (1) main break that occurred during July 2019.
- August 2019 Main Breaks Reports: There were six (6) main breaks that occurred during August 2019.

SUMMARY OF BUSINESS:


Questions and comments followed:
2. Officer Shortages: Dwyer asked about HPD not following leads and the impact of decreasing these practices. Sergeant Sakai stated that HPD is short staffed and may not follow up on cases that have no leads or evidence. Sergeant Sakai noted that they will continue to investigate any cases that have evidence or leads.
3. Abandoned Vehicles: Imamura-Urús asked about abandoned vehicles blocking traffic and stated that the City and County of Honolulu is backlogged on removing these vehicles. Imamura-Urús noted that these cars create a safety concern and stated that she is thankful for their efforts with Waimau.
4. Crime Mapping Statistics: Beekman noted the HPD response about crime mapping statistics and stated that she was asking if the sexual and other assault cases reported on the website were either real or fake cases. Sergeant Sakai stated he has found the website to be accurate and noted that the cases on the website. Beekman stated that there have been instances where the website has been updated online, or at a local event, Lowes, and the Pacific Pipe Company. Provided tonight is a rundown containing general information about the Weather-Based Irrigation Controller and how you can apply to be a part of this water conservation device. Find out more at www.boardofwatersupply.com/rebates.
5. Water Emergency Preparedness: Natural disasters, power outages, or other unexpected events can affect the BWS’s ability to provide water service to the community. September is Natural Preparedness Month and serves as a reminder to have an emergency preparedness kit available for your household. One (1) crucial component of your preparedness kit is drinking water supply. Residents should store at least one (1) gallon of water per person per day for at least five (5) to seven (7) days. Also, in the event of an emergency, it is very important to stay tuned to media reports to receive water information bulletins and take any appropriate actions announced by the BWS or other emergency response agencies. More information about water preparedness can be found online at www.boardofwatersupply.com/emergencypreparedness. To receive emergency alerts via email or text message, consider subscribing to the BWS at HH190.

6. General Water Announcements: 2019-2020 Halawa Xeriscape Garden Workshop Schedule: The BWS and Friends of Halawa Xeriscape Garden continue to offer workshops. The xeriscape workshop schedule features new and popular workshops that offer useful tips on how to maintain a beautiful and water-efficient garden. These are on Wednesdays and Saturdays throughout the year. Workshops begin at 10:30 a.m. and advanced registration is required. Call 748-8115 or email workshops@bws.hawaii.gov to reserve a spot. Visit our website www.boardofwatersupply.com to check out the full list of classes offered. The Halawa Xeriscape Garden remains open to the public on Wednesdays and Saturdays from 9:00 a.m. to 3:00 p.m. Residents are welcomed to drop by to see dozens of attractive and less-thirsty plants on display, as well as pick up a complimentary seed packet. Provided this evening is a flyer containing information about the current workshop schedule at the Halawa Xeriscape Garden. Upcoming workshops include:
Questions and Concerns followed: Irrigation Controller: Wood noted that the water irrigation controller paid for itself over a few years of its use and stated that the controller has a phone application to control the device.

HONOLULU RAIL TRANSIT PROJECT (HRTP): Pat Lee of the Honolulu Authority for Rapid Transportation (HART), and Jason Tayrors (Nam Inc.) reported the following:

- September 2019 Report: Interim Service - HART and the City are working together to prepare for an initial opening of passenger service on the Honolulu rail system prior to launching full service by the end of 2025. The City’s Department of Transportation Services will be in charge of operating and maintaining the rail system along with the bus and the handiVan. Introductory Service between the Kualakai Station (East Kapolei) and the Halawa Station (Aloha Stadium) is targeted to start in late 2020. This would include nine stations from Kapolei near the Kroc Center, through Waipahu, Pearl City and Aiea, and include stops serving UH West Oahu, Leeward Community College, Pearlridge Mall and the Aloha Stadium. Besides the guideway and stations, rail also includes the Core systems which are the train cars, the automated communication and control systems which operate the trains and the stations, and the rail operations center and maintenance and storage facility, which is at 62% completion. These system components are being constructed, installed, tested and readied. HART is taking delivery of the fully automated train cars, which are being manufactured by Hitachi Rail and shipped from its final assembly plant in Pittsburg, California. The introductory passenger service will give HART and DTS staff and the general public the opportunity to get to know and learn the rail system, the stations, their locations and amenities, access to the stations and boarding areas and how to ride and use the fully automated, driverless system. An expanded opening of rail service between the Kualakai Station (East Kapolei) to the Middle Street Station is targeted to begin by the end of 2022. This second opening would include stops serving Pearl Harbor and the Daniel K. Inouye International Airport. Full Revenue Service of the 20-mile, 21 station rail system to the Ala Moana Center station is scheduled to commence by the end of 2025. The Federal Transit Administration (FTA) has approved HART’s recovery plan. This clears the way for the FTA to release $744 million that is part of the city’s Full Funding Grant Agreement, once the F/3 contract is successfully awarded early next year for the City Segment. The City Rate Commission is holding public hearings on the fares for bus and rail, and will consider such topics as whether fares will be flat rates or distance based rates, monthly and annual passes and which categories to offer, such as Adult, Youth, and Discounted eligible passes for Seniors, Disabled, Low Income, and what the appropriate fare would be for those periods. The Rate Commission’s next meeting is on Tuesday, September 17th from 2:30 and 4:30PM at the Mission Memorial meeting room, City Hall. The Commission will make their recommendations to the Mayor and the City Council who will decide on the fare structure.

Contact Information: For more information, please visit the HART website at www.honolulurail.org, you can call the project hotline at 566-2299 or email a question to info@honolulurail.org.

- Update: Jason Tayrors provided the following report for Nan Inc.:
  - Traffic Control Measures: Tayrors noted that Nan Inc. will be focusing on the South West corner of Maili’s business district property in an attempt to open the line of sight onto Kamehameha Highway going west bound. Tayrors noted that they are slated to finish by the end of September 2019.
  - Road & Highway Builders (RHB): Danny Rosario gave the following report for RHB:

Kamehameha Highway Repaving Project: RHB finished repaving the Pearl City region of Kamehameha Highway and noted that they are almost complete within Alea. RHB will continue to repave and widen the roadway during the evening. Contact Information: Please call Rosario at 285-2540 for more information about the project.

Questions, comments, and concerns:

1. Roadway: Fatafehi noted that the roadways near Pearl Kail Shopping Center near Kamehameha Highway and Wood noted that they will install the loop detectors during this period. Rosario noted that they will be installing.

2. Power Lines: Dwyer asked about the 193 kilovolt (KV) lines being installed along Dillingham Boulevard and noted that they were installed underground for safety. Wood noted that the lines could be installed above ground easier and Lee noted that these power lines were 46 KV.

3. Interim Service: Wood asked and Lee noted that interim service from Kapolei to Aloha Stadium will begin in 2020. Wood asked and Lee noted that it would most likely start towards the end of 2020.
Questions and comments followed:

1. **Business Concerns:** Wood noted the surrounding businesses’ concerns about parking within the region and stated that the OCCC plans to keep their parking area.
   
   Chair Clark noted concerns about parking, traffic, and other business concerns. Wood stated that the OCCC should listen to the businesses about their concerns for the project.

2. **Community Concerns:** A resident noted community objections to the previous Halawa prison and stated that OCCC would be built with even more community objections. Stevens noted that they have had studies that detailed Halawa as the best location. The resident noted that the prison should be built within Hawai‘i Kai.
   
   Stevens asked and the resident noted that they do not want to live next to a jail. Chair Clark noted concerns about OCCC facilities having issues with escapes. Chair Clark asked that OCCC detail their plans to the community before they take any steps forward. Fattahi noted that the lack of prison personnel leads to the system not being properly served and stated that he is concerned for the community’s safety.

   A representative noted that she is the Principal for the OCCC project and assured the community that they do not want to be an unwanted neighbor. The representative noted that they are following the process at hand and stated that there is a need for community input. The representative noted that OCCC will need to be able to answer community concerns in the future. The representative noted that the new job facilities will be safer and will offer more jobs. The representative noted that OCCC will need to trust in the process and stated they will answer questions when the information is available. Dwyer noted that the community was not receptive to keeping OCCC and stated that the region did not have a receptive attitude towards the site. Dwyer noted concerns with trusting them due to previous surveys. Stevens noted that some concerns occur due to a lack of information and stated that more information would help with community concerns. Dwyer noted that the subjective rating for “Reception” was incorrect due to the community having issues with the site. Kimball noted that the new location would be surrounded by businesses not homes and stated that Kahului would be at a greater risk due to residents surrounding the site. Chair Clark noted that the community needs to rebuild trust due to the government not following the plans previously detailed. Chair Clark noted that the community concerns are for the community five (5), 10, and 20 years from now. Chair Clark noted that importance of utilizing foresight. Chair Clark stated his concerns with the previous area and noted they are not being answered and noted that the community needs more information during the process to answer better questions from OCCC.

3. **Inmate Concerns:** Chair Clark noted that this project would combine populations of felons and less offenders in one (1) site. Chair Clark noted that OCCC is unable to properly staff their system and noted that this leads to a lack of prisoner visitation privileges.

4. **PRU Details:** Sugimura asked and Stevens stated that the PRU would allow them to find a place that could be more detailed than the current system. Chair noted that they cannot move forward without the PRU and consideration.

Chair Clark MOVED and Dwyer SECONDED the MOTION that the Alea Neighborhood Board No. 20 does not support the approval of Resolution 19-136. Tsuji recused himself from the Agenda Topic due to a possible conflict of interests.

Discussion followed:

1. **Jason Worley:** Dwyer noted his opposition to the project and stated that he questions the reasoning for picking the site. Wood asked and Chair Clark stated that he would not support the current OCCC plan.

2. **Motion Clarify:** Arakawa noted the need to have their reasoning detailed within the motion.

   In response, Tsuji recused himself from the vote due to a conflict of interest.

Arakawa MOVED and Whitfield SECONDED the AMENDMENT that the Alea Neighborhood Board No. 20 is not supporting Resolution 19-136 based on the lack of information and responses to the Board. The MOTION TO AMEND PASSED by UNANIMOUS CONSENT, (14-0-V). (Aye: Sugimura, Arakawa, Fattahi, Wood, Fitch, Kimball, Arakawa, Beekman, Clark, Whitfield, Dwyer, Muzawa, Morwaki, and Imamura-Urui; Nay: None; Abstain: None.)

The MOTION that the Alea Neighborhood Board No. 20 does not support the approval of Resolution 19-136 based on the lack of information and responses to the Board. The MOTION PASSED by QUORUM VOTE, 13-1. (Aye: Sugimura, Arakawa, Fattahi, Wood, Arakawa, Beekman, Clark, Whitfield, Dwyer, Muzawa, Morwaki, and Imamura-Urui; Nay: Kimball; Abstain: Fitch.)
Misuwaza and Tsuji exit the meeting at 9:22 p.m.: 13 members are present.
Helicopter nuisance in the Halawa area: Representatives from the Hawai‘i Helicopter Association (HHA) were present to answer questions from the community.

Questions and comments followed:
1. **Community Concerns:** Wood noted the constant helicopter flights that circle around Pearl Harbor and Halawa Estates. Wood noted that resident concerns about helicopters in the area are paramount. Wood noted that flying over homes is not viable. The HHA noted that they are under federal regulations to stay within set flight parameters.

Beekman exited the meeting at 9:25 p.m.: 12 members present.

Tsuji rejoined the meeting at 9:26 p.m.: 13 members present.

2. **Flight Details:** A resident noted that the HHA has a collective bargaining agreement (CBA) for the rights to fly over Pearl Harbor. The HHA noted that they must fly below 1,000 foot canopy while flying by Ford Island. Wood asked where the flights are going and the HHA noted that they are trying to stay between Aloha Stadium and the Pearl Harbor Visitors Center. Representative Cachola asked and the HHA noted that they need to stay below the 1,000 foot canopy for the region. Representative Cachola asked if they need to fly over Halawa Estates and the HHA noted that they need to fly within the 1,500 canopy for controlled airspace. Wood asked and the HHA noted that the Arizona Memorial would be part of a 60 minute around island tour and stated that they must fly through this region to return to Daniel K. Inouye International Airport. Wood asked why they cannot approach from the east and the HHA noted that they fly in a counter clockwise rotation on normal trade wind days. Representative Cachola asked if there are penalties for flying below the required flight altitudes and the HHA noted that they fly within regulations or lose their permits. Dwyer asked and the HHA noted that they are given flight directions and not specific flight routes to follow. Wood stated that the community has been able to wave at passengers on the helicopter. A resident noted that they are not flying at 400 feet due to safety and noise abatement.

3. **Flight Tracker:** Chair Clark asked and the HHA noted that residents can track flights at [https://www.flightradar24.com/](https://www.flightradar24.com/). The HHA noted that any Magnum Helicopters flights that are witnessed flying below regulations can be reported to 834-1111. The HHA noted that noise concerns can be reported as well.

Beekman and Misuwaza rejoined the meeting at 9:29 p.m.: 15 members present.

**Planned removal of the crosswalk at Uluene Street at Puaa Street:** Kikuchi from the Department of Transportation Services was present to answer questions from the community:

Questions and comments followed:
1. **Removal of Crosswalks:** Wood does not understand why the crosswalk is being removed due to it being located next to a bus stop. Kikuchi noted that they are removing the crosswalk marking and stated that their previous crosswalk marking system was outdated. Kikuchi noted that the speed and volume of the roadway is not safe and stated that they have made multiple attempts to reduce speed with lighted speed signs. Kikuchi noted that 85 percent of the drivers are driving at 42 miles per hour (MPH). Wood noted his confusion with removing a crosswalk from a high volume region. Kikuchi noted that removal of the crosswalk creates a more alert situation for the pedestrians and results in less injuries and fatalities. Wood noted that the elderly will still cross the road without the crosswalk and Kikuchi noted that pedestrians can still cross the road at this location.

Chair Clark handed the gavel to Vice Chair Sugimura at 9:46 p.m.
2. Permit Details: Fitch asked and Tokuno noted that the permit would be for one (1) and a half years.
3. Community Concerns: A resident noted that the church would affect the neighbors due to noise and stated that they do not oppose the Conditional Use Permit currently encroaching within her property line. The resident noted her opposition to having the church neighboring her property. A resident noted that the direct neighbors to the property oppose a church being built and stated that they do not oppose the originally planned bible study site. A member of the congregation noted that the site has been used as a bible study site and stated that they do not have large church services on site.

Naylon exited the meeting at 10:10 p.m.

Wood moved and Whitfield seconded the MOTION to OPPPOSE the Conditional Use Permit (CUP), 99-679 Aliiwoe Drive. The MOTION PASSED by QUORUM VOTE, (13-2-0). (Aye: Sugimura, Arakawa, Wood, Fitch, Arakaki, Beekman, Fatofono, Clark, Whitfield, Dwyer, Mizusawa, Moriwaki, and Imamura-Urus; Nay: Kimball and Tsujii.

Abstain: None.)

ANNOUNCEMENTS: Tamamoto announced that the Aeoa Community Association (ACA) will be hosting their annual Christmas Parade on the Saturday, December 14, 2019. The parade will begin at approximately 10:00 a.m. and end at 2:00 p.m.

ADJOURNMENT: Due to time concerns, Chair Clark adjourned the meeting at 10:36 p.m.

Submitted By: Chris Naylon, Neighborhood Assistant
Reviewed By: Harry Cho, Public Relations Specialist
Reviewed and Finalized By: Chairman Bill Clark

REGULAR MEETING MINUTES
MONDAY, OCTOBER 14, 2019
AEA PUBLIC LIBRARY PROGRAM ROOM
CALL TO ORDER: Chair Bill Clark called the meeting to order at 7:03 p.m.; quorum was established with 10 members present. Note – This 15 member Board requires eight (8) members to establish quorum and to take official Board action.


Members Absent: Tracy Arakaki, Carolyn Kimball, Mike Dwyer, and David Arakawa.

Guests: Representative Aaron Ling Johanson; Representative Romy Cachola; Representative Sam Kong; Linda Nunez (Senator Breene Harimoto's Office); Councilmember Brandon Elefante & April Coloretti (Councilmember Elefante's Office); Councilmember Card Fukunaga; Anela Kelo’olani and Radiant Condors (Councilmember Joey Manahan's Office); Lieutenant Okgawa and Sergeant Nitta (Honolulu Police Department); Firefighter Jonathan Kam (Honolulu Fire Department); Tracy Burgo (Board of Water Supply); Pat Lee (Hawaii Authority for Rapid Transit); Danny Rosaria (Road & Highway Builders LLC.); Claire Yamamoto, Loren & Laurie Chang (Aeoa Community Association - ACA); Scott Chow (Aloha Stadium); Chris Kimimaka, Joseph Eaton, and David Deportes (Department of Accounting and General Services); Victor Fint (NAVAC); Joseph Acosta (Aeoa Bridges); (Teri McFarland (Architects Hawaii Limited); Trisha Watson (Honua Consulting); Karen Luin, Clarissa Ho, Sharon Chun-Lum (Residents); and Christopher Naylon (Neighborhood Commission Office). Note: Name was not included if not legible or on the guest attendance sheet.

CITY MONTHLY REPORTS:
Honolulu Fire Department (HFD): HFD gave the following report:
- September 2019 Statistics: There were two (2) structure fires, two (2) nuisance fires, one (1) cooking fire, one (1) activated alarm (no fire), 62 medical emergencies, three (3) motor vehicle collision with pedestrians, two (2) motor vehicle crash/collisions, and three (3) hazardous materials incidents.
- Safety Tip: Haloween Safety: When selecting a costume, stay away from long, trailing fabric, as it may be a trip hazard or attach to an object and cause a fall. If you create your own costume, select materials that will not be easily ignited if it comes into contact with heat or flame. If your child is wearing a mask, ensure the eye holes are large enough so they can see out. Provide children with flashlight for lighting or glow sticks as part of their costume. It is safest to use a flashlight or battery-operated candle in a jack-o-lantern. The HFD discourages the use of candles.

Honolulu Police Department (HPD): Sergeant Nitta gave the following report:
- September 2019 Statistics: There were nine (9) motor vehicle thefts, 11 burglaries, 34 thefts, 24 unauthorized entry of motor vehicles (UEMV), and 5,599 total calls for service.
- Safety Tip: Pedestrian Safety – Be sure to use safety reflector vests or devices on children’s costumes while trick-or-treating. Always use crosswalks and obey pedestrian traffic light signals.

Questions and comments followed:
1. Lighting: A resident asked about illegal parking not being enforced within Aeoa and noted that these vehicles also litter. Sergeant Nitta noted that parking citations are $35 and asked that the community continue to call 911 to report these incidents. The resident noted that emergency vehicles cannot traverse the region due to the amount of illegally parked cars.
2. HPD Budget: A resident asked how the community could assist with the HPD budget. Sergeant Nitta noted that the department needs to be legislation to assist with the hiring of more officers. The resident asked and Sergeant Nitta noted that HPD is always recruiting officers. Chair Clark noted that there are three (3) to four (4) recruiting classes per year and stated that there is an issue with retaining officers until the detective level. The resident asked if additional perks could be given to HPD officers and Chair Clark noted that our elected officials would need to answer these questions. The resident noted that there is an issue with retaining...
Board of Water Supply (BWS): Tracy Burgo reported the following:
- **September 2019**: There were three (3) main breaks during September 2019. Burgo noted that the infrastructure for the region is aging and will continue to be replaced.
  - **Friday, September 6, 2019**: An eight (8) inch main broke at 98-1334 Kaaanlohi Street.
  - **Saturday, September 7, 2019**: A 12 inch main broke at 1009 Koko Mai Drive.
  - **Friday, September 20, 2019**: An eight (8) inch main broke at 98-1846 Nailei Street.

Board of Water Supply Facilities Tour Program: The Board of Water Supply (BWS) offers public education programs to help the community understand and learn about our water resources. One (1) of our outreach programs includes “group tours” of the Ha'awela Xeriscape Garden (60 persons maximum) and Wailea Tunnel (30 persons maximum). The Haawela Xeriscape Garden is located in Ha'awela Valley's Central Park Industrial Area and promotes outdoor water conservation. The Wailea Tunnel Tour will awaken your senses with a walk inside the 1,500-foot tunnel that provides water to Windward Oahu. These tours are scheduled to start on Sunday, December 15, 2019 and are available by appointment only. Please register by calling 808-748-5041 or email tours@bws.hawaii.gov. Provided tonight is a handout containing information about the Ha'awela Xeriscape Garden Tour.

Honolulu Rail Transit Project (HRTP): Pat Lee of the Honolulu Authority for Rapid Transportation (HART), and Jason Tayoros (Nain Inc.) reported the following:
- **October 2019 Report: Rail Update**: If you think traffic is bad on Oahu, a number of recent national studies prove that you are correct. One (1) study (Insurrly, a website that compares auto insurance rates) ranks Honolulu as having the 9th worst traffic among cities in the US with a congestion level of 28% and average commute time of 29.1 minutes. Another study done by the Texas A&M Transportation Institute, found that the average Oahu driver spends 64 hours — or more than two (2) and half days — in congestion each year, which is up from 53 hours of congestion annually in 2009, and 29 hours annually in 1989. This study also estimates that congestion costs the average Oahu commuter $1,260 a year, including an additional 29 gallons of gas. Multiplied by all Oahu’s drivers that translates to $689 million in congestion costs annually and 15.7 million gallons of wasted fuel. And it gets worse for those who live farther from urban Honolulu. Another study of Oahu commuters shows that the number of people who spend 90 minutes or more each way commuting to work grew by almost 29% over the last decade, even as the total workforce increased by 24%. Drivers, called “super commuters,” are spending three (3) hours or more commuting to and from their jobs each and every day. An accident or bad weather can extend their travel times even more. Commutes have an effect on everything from the job market to housing, as people who cannot afford to live in the higher priced homes in Honolulu’s urban core move farther away to Ewa, Kapolei, Central or Leeward Oahu, where homes have lower median prices. But the trade-off is much longer commuting and more time lost on the road which could be spent doing other, more productive or enjoyable things. Once up and running, rail will provide a safe, reliable, and efficient transportation option for commuters and will become an important component of the city’s public transit system. The HART rail system will serve the communities of the people of Honolulu. The travel time for rail between Kapolei and Ala Moana Center will be 42 minutes, including stops at each station. Transit oriented development along the rail route will also increase affordable housing opportunities for island residents who would also have easy access to public transportation for commuting to and from work, schools, or other activities.
- **Construction Information**: For more information, please visit the HART website at www.honoululustransit.org. You can call the project hotline at 566-2299 or email a question to info@honoululustransit.org.
- **Nan Inc. Update**: NAN Inc. will conduct an overnight closure westbound at Salt Lake Boulevard and Kamehameha Highway on Wednesday, October 16, 2019 from 9:00 p.m. to 5:00 a.m. The westbound sidewalk will also be closed.

Questions, comments, and concerns:
1. **Route Duration**: Chair Clark asked and Lee noted that the route from East Kapolei to Ala Moana Center would take 42 minutes. Lee noted that the system will take 20-25 seconds per stop. A resident noted that the commute time does not include the amount of time needed to get to and from the station. Lee stated that there will be circuit buses to assist with residents leaving the station and noted that residents can still use cars, bikes, and cars to travel to and from the station. Lee noted that the rail system could be used to alleviate the need for excessive parking fees at the airport.
2. **Cement Details**: Beekman asked about the type cement used in the guideways and pillars and the water to cement ratio. Rosario noted that they did not use excessive amounts of water and Lee will provide details.
3. **Pillar Designs**: Tsujii asked about designs on the pillars and Lee noted that one (1) percent of construction cost ($3.2 million) to be spent on public art. Lee noted that this lead to some of the pillars being embossed. Tsujii asked and Lee noted that some of the pillars were covered due to concerns of vandalism.
4. **Kaniu Street Intersection**: Whitfield noted that the intersection of Kaniu Street and Kamehameha Highway has a large intersection. Rosario will report back.
5. **Transit Oriented Development (TOD)**: A resident asked if TOD will be used around the rail line and Lee noted the TOD information about TOD can be found online at www.honolulu.gov/hrtp. Lee noted that the City Council approves TOD after receiving community input.

Elected Officials:
**Governor David Ige’s Representative**
- Mayor Kirk Caldwell’s Representative: Department of Information Technology (DIT) Deputy Director Keith Ho was present to field questions from the community.
- **A1 Rentals**: On Monday, July 29, 2019 and Tuesday, July 30, 2019, District 3 (Aiea/Pearl City/Waipahu) Community Policing Team officers made checks and marked 15 vehicles belonging to A1 Rentals for abandonment. A field check was made the next day and all vehicles had been moved. Officers spoke to the A1 Rental management and was informed that they now have another storage area for most of their vehicles. Checks were made with the Department of Transportation Services (DTS) and Department of Planning and Permitting (DPP) regarding the legalities of this business practice and was advised that there is no law prohibiting the parking of vehicles on City roadways. Officers will monitor the area and take the appropriate enforcement action.

- **Proposed Changes to Bus Routes**: OTS noted that they are unable to report at the October 2019 Meeting.
- **Illegal dumping**: ENV reported that a Refuse Inspector from the City’s Department of Environmental Services (DES) Refuse Division, was dispatched to Aiea Heights Drive on Thursday, September 12, 2019. Upon inspection, bulky items were found footing 99-1047 Aiea Heights Dr; however, the source was indeterminable. On Wednesday, September 25, 2019, ENV removed the illegally dumped items from this area.

Draft Regular Meeting Minutes

**Aiea Neighborhood Board # 20**

Monday, October 14, 2019

**PAGE 2 OF 8**

**Aiea Neighborhood Board # 20**

Monday, October 14, 2019

**PAGE 3 OF 8**
location. We encourage residents to report illegal dumping when seen to HPD and to our Refuse Division at 768-5220. Inspectors will continue to periodically monitor this area and issue citations for violation of the prevailing ordinances on lot. HART noted that the dust concerns will continue to decrease as the project continues and stated that they will continue to implement other dust mitigation practices.

Questions, comments, and concerns followed:
1. Illegal Dumping: Tsuji noted that there is excessive illegal dumping along Alea Heights Drive. Deputy Director Ho noted that Env will monitor the region.
2. RTS: Chair Clark stated that he would need to know when RTS would be available for a presentation and asked that RTS contact him. Deputy Director Ho noted that there will be an increase in commuter routes within the region. Chair Clark noted the importance of having RTS at the December 2019 or January 2020 meetings.
3. Refuse Bins: A resident asked if he could acquire additional refuse bins and noted that they did not qualify for an additional bin. The resident noted that homes are allotted up to five (5) bins per residence. Deputy Director Ho noted that there is a limited amount of bins due to union concerns and will follow up. The resident noted that their neighbors illegally dump into their bins too.

Senator Donna Mercado Kim: Senator Kim was not present; her monthly report was disseminated.

Representative Aaron Ling Johnson: Representative Johnson was present; the following report was given:
- Legislative Update: Representative Johnson asked that the community contact their respective representatives to inform them of any ideas for the upcoming legislative session.
- Cyber Security Month: Representative Johnson noted that October is Cyber Security Month and asked the community to be aware of scams online.

Representative Ronnie Cachola: Representative Cachola distributed his newsletter and reported:
- House Bill HB1462 HD1: Representative Cachola noted his attempts to pass HB 1462 HD 1 which would save the City and County of Honolulu $500 million per year.

Representative Sam Kong: Representative Kong was present; the following report was given:
- Legislative Update: Representative Kong asked that the community contact their legislators with any ideas for the upcoming 2020 Legislative Session.

Questions, comments and concerns:
1. Alea Community Association (ACA) Christmas Parade: Tamamoto asked if Representative Kong will be attending their ACA Christmas Parade on Saturday, December 14, 2019.
2. Dahlu Community Correctional Center (OCCC): A resident thanked Representative Kong for his letter about OCCC and asked if the topic will continue in the future. Representative Kong noted that it is an ongoing conversation between the federal, state, and city level.

District 8 Councilmember Carol Fukunaga: Councilmember Fukunaga was present; a handout was disseminated to the community:
- Deferral of Resolution 19-136: On Thursday, September 26, 2019, the City Council’s Zoning, Planning, and Housing Committee postponed action on Resolution 19-136, which approves an application for a Plan Review Use (PRU) Permit for relocation of OCCC from Kahili to Halawa Valley. The State Department of Accounting and General Services (DAGS) and Department of Public Safety (DPS) testified in support of the PRU application, and said that approval was needed in order to determine project parameters, scope of the work, and costs of constructing a new jail facility.

Representative: The deadline for comments will be on Tuesday, November 5, 2019. Public input can be received by email at nsed.comments@parks.dpd.gov or via mail at “NSED COMMENTS,” 1507 S. Beretania Street, #400, Honolulu, HI 96810.

Tsuji remained the meeting at 8:08 p.m.; ten members present.

Questions and comments followed: Public Deferral: Sugimura asked about the deferral of Resolution 19-136 and Councilmember Fukunaga noted that the City Council is attempting to determine if all community concerns have been addressed by the state and contractors. Chair Clark noted that more information can be found in a Sunday, October 6, 2019 Star Advertiser article about the meeting and a resident noted that the meeting can be watched on Oahu Community Media.

Anna Stadium: Hoonakama from the Department of Accounting and General Service (DAGS): the following report was given:
- Public Commenting Period: Hoonakama noted that they are still within the programmatic environmental impact study (EIS) process and stated that they have extended the public commenting period until Friday, November 8, 2019.

Hoonakama: there was a roadway project, September 25, 2019 meeting that two of community members present. Hoonakama noted that there was a Wednesday, October 2, 2019 meeting with the swap meet vendors and stated the importance of the swap meet to the community. There was a Public Private
Questions and comments followed:

1. **Community Concerns**: Arakawa noted that this information was not in the draft given to the surrounding residents. Arakawa noted the lack of communication and that this process would lead to poor public comment. Chair Clark noted that the Board had difficulty contacting the surrounding residents. Arakawa noted that the church could greatly impact the surrounding community more than a monster house and asked for the Board's support in opposing the CUP. Tokuno noted that the previous application was a draft. Arakawa asked if the updated application will be sent to the surrounding community and Tokuno stated that the DPP asked them to contact the surrounding neighbors. Tokuno noted that it is a CUP that could be limited by the City and County of Honolulu. Arakawa asked and Tokuno noted that they will send their final applications. Wood asked and Tokuno noted that they will have the final applications in November 2019. Wood asked and Tokuno noted that their public meetings are the Neighborhood Board meetings. Wood noted the need to send new applications to the community and Tokuno noted that he will. A resident asked about additional parking if Guss Webbing Elementary is unavailable and Tokuno noted that they have more parking stalls than is required by the permit. Imamura-Uruno asked about the schedule for their congregation.

2. **Public Hearing**: Arakawa requested a public hearing for the permit. Chair Clark noted that he could refer the item to the zoning committee and Councilmember Fukunaga stated that the Director DPP would need to refer it to public hearing. Chair Clark noted his desire to defer the topic until additional information can be garnered. Arakawa noted his want for a public hearing in order to garner additional community input. Tokuno noted that Arakawa's comments will be part of the DPP permitting process.

3. **Permit Details**: Wood asked and Tokuno noted that their parking lease is yearly.

4. **Permit Details**: Tsuji noted that this is a ministerial act which would be difficult to deny. Councilmember Fukunaga noted that the permit would be accepted if the all CUP criteria are met. Tsuji noted that the process is similar to approving building zoning.

Wood moved and Tsuji seconded the MOTION to SUPPORT the Conditional Use Permit (CUP) at 99-679 Aliiolo Drive.

Discussion followed:

1. **Board Resolution**: A resident asked for additional information about the Board resolution and Chair Clark noted that the Board does not have a resolution.

2. **Community Concerns**: Fitch noted his opposition due to community concerns and a possible lack of parking. Tsuji noted that other churches in the area also have parking agreements and large centers built within the residential area. Tamamoto noted that the Area Korean United Methodist Church has its own parking lot and noted community concerns about noise. Tamamoto noted that Saint Elizabeth Catholic Parish has a parking agreement to rent a parking lot. Wood noted that the CUP could be withdrawn due to violations. Tamamoto noted that a CUP is meant to repurpose a property and stated that the congregation needs to show additional information for the permit. Fatafate noted that there is too much uncertainty with the lack of information and stated that the community should have their comments heard. Arakawa noted that he does not oppose the church but asked that the community have more direct public input on the subject. Chair Clark noted that the Board may not have jurisdiction on the subject and asked if the City Council is charged with the process. Wood asked and Tsuji noted that the Board can suggest a public hearing to the IPP.

The MOTION to SUPPORT the CUP at 99-679 Aliiolo Drive FAILED by Roll Call Vote, (2-5-3). (Aye: Wood and Tsuji; Nay: Sugimura, Fitch, Clark, Whitfield, and Moriwaki; Abstain: Fatafate, Beeke, and Imamura-Uruno.)

Mizusawa entered the meeting at 9:05 p.m.; 11 members present.

Employees' Retirement System (ERS) Unfunded Liability: House Bill (HB) 1462 House Draft (HD 1): Representative Cachola was present; gave the following update:

- HB 1462 Details: Representative Cachola detailed his bill that would have state beneficiaries utilize self-insure or self-funded health care plans. 29 states have now switched to a self-insured plan. 18 of these states use a self-insured plan with additional pre-funding fees while 11 states use a "pay-as-you-go" plan without pre-funding. Other states have been able to expand benefits and access to quality providers since its passing. Representative Cachola stated that this will lead to premium stabilization The HB is meant to create a study for a self-insurance model that could lead to the conversion to a self-insured model with a positive report from the consultant. Representative Cachola noted that the HB is dedicated to the beneficiaries that are one (1) paycheck away from being homeless and the young and future generations. Representative Cachola stated that if we do not act now, the young and future generations will be burdened with this obligation.

Questions and comments followed: Process Details: Fatafate asked how long Mississippi has been using this process and Representative Cachola noted that they have used this process since 2010. Fatafate asked how this process would affect insurance companies and Representative Cachola noted that they may need to become third party administrators. Wood asked and Representative Cachola noted that the House of Representatives approved the bill unanimously. Wood asked and Representative Johnson noted that the House of Representatives has approved the bill but it has not been approved by the Senate. Wood asked and Representative Cachola noted that he is unsure on the Senate's reservations. Representative Cachola noted that the bill would save tax payers money. Representative Cachola noted that over 300 companies and unions have switch to self-insured systems. Fatafate asked and Representative Cachola noted their attempts to convince state unions of its benefits. Representative Cachola noted the resolutions urging the legislature to pass the bill.

TREASURER'S REPORT: Fitch read the reports from July 2019 until September 2019. There was a total expenditure of $30,10 and a remaining balance of $389.90 in July 2019. There was a total expenditure of $20.98 and a remaining balance of $386.92 in August 2019. There was a total expenditure of $30.07 and a remaining balance of $338.85 in September 2019.

COMMITTEE REPORTS:

Executive Committee: Chair Clark reported that Neighborhood Board No. 18 Alamanu/Foster Village/Salt Lake is attempting to obtain Neighborhood Board No. 19's district. Nalon will attempt to disseminate a map to the Board with the Neighborhood Board No. 19 boundaries. Chair Clark is unsure if it would affect the Red Hill Fuel Storage Systems. Beeke man asked if it would encompass the homes near Kaiser Permanente.
Parks and Recreation Committee: Chair Clark noted that the Parks Committee may not have any concerns currently and Tamamoto noted that light systems may be an upcoming issue at Aiea’s regional parks.

Restoration and Advisory Board: Chair Clark noted that the Registration and Advisory Committee needs a Chair and Whitfield volunteered to be Chair. Hearing no objections, Whitfield will chair the Registration and Advisory Committee and will reach out to the community member.

Red Hill Fuel Tanks Committee: Beekman noted that there will be two (2) upcoming meetings for the community in regard to the Red Hill Fuel Storage Systems. The first meeting will be held on Tuesday, October 15, 2019 from 6:00 p.m. until 8:50 p.m. at the Oahu Veterans Center. The meeting will consist of informational displays about the Red Hill tanks at various locations throughout the room along with specialists explaining each display and answering questions. The second meeting will be held on Thursday, October 17, 2019 at the Hawai’i State Capitol. This is the annual meeting of an advisory committee on the military underground storage tanks in Hawai’i. Military officials, as well as others, will speak. Wood asked and Beekman noted that the military generally offers monthly tours of the fuel storage systems.

ANNOUNCEMENTS:
A. Tamamoto announced that the Aiea Community Association (ACA) will be hosting their annual Christmas Parade on the Saturday, December 14, 2019. The parade will begin at approximately 9:00 a.m.
B. Next Meeting – The next Board meeting will be on Monday, December 9, 2019, at the Aiea Public Library Program Room (99-374 Pohai Place, Aiea, HI 96701), at 7:00 p.m.
C. The Aiea Neighborhood Board will recess in November 2019
D. Aiea Neighborhood Board Facebook Account: http://www.facebook.com/BeautifulAiea

ADJOURNMENT: Chair Clark adjourned the meeting at 9:35 p.m.

Submitted By: Chris Nayan, Neighborhood Assistant
Reviewed By: Janelle Nomura, Neighborhood Assistant
Reviewed and Finalized By:

REGULAR MEETING MINUTES
MONDAY, DECEMBER 9, 2019
AIEA PUBLIC LIBRARY PROGRAM ROOM

CALL TO ORDER: Chair Clark called the meeting to order at 7:01 p.m.; quorum was established with 11 members present. Note – This 15 member Board requires eight (8) members to establish quorum and to take official Board action.

Members Present: Bill Clark, Jane Sugimura, Willie Fatatea, Ron Fitch, Carolyn Kimball, Russell Tsuji, Pat Beekman, May Imamura-Urui, Francis Whitfield, Mike Deyer, Richard Mizusawa, Tracy Arakaki (Arrived at 7:04 p.m.), Jenna Motwaki (Arrived at 7:13 p.m.), and David Arakawa (Arrived at 7:23 p.m.).

Members Absent: Stephen Wood.

Guests: Representative Aaron Ling Johnson; Representative Romy Cachola; Representative Sam Kong; Linda Nuno (Senator Beene Harimoto’s Office); Councilmember Brandon Elefant & April Coletti (Councilmember Elefant’s Office); Kim Ribellis (Councilmember Carol Fukunaga’s Office); Anela Koko’olani and Radiant Cordero (Councilmember Joey Manahan’s Office); Lieutenant Pascual and Sergeant Sakai (Honolulu Police Department); Firefighter Jonathan Kam and Firefighter James Duggin (Honolulu Fire Department); Tracy Burgo (Board of Water Supply); Pat Lee (Hawaii Authority for Rapid Transit); Danny Rosana (Road & Highway Builders LLC); Claire Tamamoto, Loren & Laurie Chang (Aiea Community Association - ACA); Jason Choy (Aiea Community Association); Linda Kinmaka, Joseph Earing, and David Depestele (Department of Accounting and General Services); Victor Flint (NAVAC); Wayne Takara (Public Safety Department); Samantha Span (Aiea Stadium Authority); Bettina Mehner (Architects Hawaii Limited); Jason Smaida (Ulahawk Architects); Pat Kim, Rodney Kim, Shari Chun-Lum, Wendy Tanaka, Sandra Thompson, and Larry Higa (Residents); and Christopher Naylor (Neighborhood Commission Office). Note: Name was not included if not legible or on the guest attendance sheet.

CITY MONTHLY REPORTS:
Honolulu Fire Department (HFD): Firefighter Duggins gave the following report:

- November 2019 Statistics. There were two (2) nuisance fires, four (4) activated alarms (no fire), 76 medical emergencies, one (1) motor vehicle collision with pedestrian, five (5) motor vehicle crashes/collisions, and two (2) hazardous materials incidents.
- Safety Tip: Christmas Safety: Sled a tree with fresh, green needles that do not fall off when touched. Add water to the tree stand daily. Use lights that are in good repair, and never use open flames, such as candles, to light your trees. Always turn off Christmas tree lights before leaving your home or going to bed. Remove the tree from your home immediately after Christmas or when it is dry. Dispose of it in your green waste bin or drop it off at any of the City and County of Honolulu’s Refuse and Recycling Convenience Centers.
- Safety Tip: New Year’s Safety Tips: Aerial fireworks and novelty items, such as sparklers and fountains, are illegal in Oahu. Fireworks are legal on Oahu and require a permit to purchase and use them. Fireworks are dangerous and are only allowed to be used by a person 18 years of age or older. The safest way to enjoy fireworks is to attend a public display conducted by trained professionals. Please be careful and observant of children playing with fireworks. More information on fireworks can be located at Satellite City Hall.

Arakaki joined the meeting at 7:04 p.m.; 12 members present.

Questions and comments followed: Emergency Access: A resident asked how HFD will gain access to regions that are inaccessible. HFD noted that they will use their ladders and even drive on sidewalks, if necessary, to get to an emergency incident.

Honolulu Police Department (HPO): Sergeant Sakai gave the following report:

- November 2019 Statistics. There were eight (8) motor vehicle thefts, 11 burglaries, 55 thefts, 41 unauthorized entry of motor vehicles (UEMV), and 6,016 total calls for service.

Oahu’s Neighborhood Board system – Established 1973
Board of Water Supply (BWS): Tracy Burgio reported the following:

- **October 2019**: There was one (1) main break in the region.
  - Saturday, October 26, 2019: An eight (8) inch main broke at 98-1396 Aaaaka Street, Aiea.
  - November 2019: There were two (2) main breaks in the region.
  - Sunday, November 17, 2019: An eight (8) inch main broke at 99-567 Kahilani Place.
  - Tuesday, November 26, 2019: An eight (8) inch main broke at 99-713 Pohue Street.

General Water Announcements: Be wary of Scam Calls/Visits: The BWS is reminding its customers to be wary of potential scams involving fraudulent phone calls or visits from people claiming to represent the water agency, stating the account is overdue, and demanding immediate payment. This warning comes as scammers have approached customers using these tactics. Anyone who receives unexpected and/or aggressive phone calls demanding payment for a past due bill are encouraged to call the BWS for verification. Do not give any information to the caller. Here are a few tips to help protect yourself from scams that may use water bills as a lure:
  - Know your account status. Call BWS customer service staff at 748-5030 or sign up online for billing services for accurate information about your account.
  - Understand BWS collection procedures. BWS does not call customers outside its business hours of 7:30 a.m. to 4:30 p.m. on Friday, 7:45 a.m. to 4:30 p.m., to request for payment. BWS does not call customers, demand payment, and collect payment all in the same phone call.
  - If a customer is contacted for overdue payment, he or she will be asked to call 748-5030 to make credit card payment.
  - Know your personal information. Never give your credit or debit card number or other personal information to any caller or visitor without knowing their true identity.
  - Hang up on suspicious callers. If you feel pressured for immediate payment or personal information, hang up and call BWS customer service at 748-5030 during normal business hours.
  - During other times, call the HPD at 911 and notify BWS customer’s service the next working day.

If you are approached by someone saying he/she is from BWS, it is acceptable to ask for official information. All personnel involved in official BWS activities will be properly credentialed, wearing official BWS attire with the BWS logo, driving BWS labeled vehicles, and carrying an official City and County of Honolulu badge, with the agency identified as the BWS. Photos of official BWS attire and vehicles can be viewed on their website. Residents are encouraged to call HPD at 911 if they encounter any suspicious activity. The community may also call the BWS at 748-5050 to file an additional report.

Water Conservation Guidelines: BWS’s 2020 Water Conservation Calendar for the BWS and community. The guide contains valuable tips to conserve water and will be available on the BWS website.

Moriwaki joined the meeting at 7:13 p.m.; 13 members present.

Questions and comments followed:

1. **Rates Increase:** Beekman asked by how many percent the BWS income decrease since the BWS has a fixed new rate; in some areas increased. Burgio noted that the last rate increase was on Saturday, July 17, 2017 and will report back.

2. **Red Hill Fuel Storage System:** A resident asked why the Red Hill Fuel Storage System upgrades are taking so long and stated that they are too reactive in regards to disasters. The resident noted that it will affect the younger generations. The resident asked if our elected officials are not doing enough to make changes.

Honolulu Rail Transit Project (HRTP): Pat Lee of the Honolulu Authority for Rapid Transportation (HART), and Jason Tang (Man Inc.) reported the following:

- **The 3 stations comprising the West Oahu Station Group being built by HART’s contractor NANC, Inc. is 93% complete.**
- **The 3 Farrington Highways Station Group built by Hawaiian Dredging is 96% complete, and the 3 stations comprising the Kamehameha Highways Station Group, also being built by NANC, Inc. are 83% complete.**
- **The Core Systems is 66% complete, with train and system testing and commissioning underway.**

- **The interim opening with limited revenue passenger service for the first ten miles of the rail route is planned for the latter part of next year starting with service from Kualalani station in Kapolei to the Kauaou station at Pearlridge, then to the Hataloa station at Aiea Stadium.**

- **The repaving and resurfacing of Kamehameha Highways following the rail construction is ongoing towards Salt Lake Boulevard which is 88% complete.**
- **The Airport Guideway and Stations segment which runs from Aiea Stadium to Middle Street, and includes 4 stations is 98% complete. HART is planning an accelerated schedule for the City Center segment which is from Middle Street to Ala Moana Center.**

- **The freeway is completed and its impacts through Kailhi by as much as 18 months.**

- **Holiday Closures:** There will be no HART work related lane closures for the Christmas and New Year’s holidays from Saturday, December 21st at 7:00 p.m. to Thursday, January 2nd at 8:30am. However, HART will review the requests for variances regarding these restrictions and may issue permits on a case by case basis.

- **Kamehameha Highway Update:** Regarding the Kamehameha Highway repaving, Road and Highway Builders (RHB) couldn’t be here tonight but I passed out the work notice:
  - **Night time paving to start Sunday, December 8, 2019 to Friday, December 13, 2019 from Kuleana Street to Pali Momi Street. Work is from 7:00 p.m. to 5:00 a.m.**
  - **Major portion of paving will be west bound Kamehameha Highway from Knaohi Street to Kaniu Street.**
  - **No work from Saturday, December 21, 2019 until Thursday, January 2, 2019.**
  - **Will continue Night paving of driveways Kuleana Street to Pali Momi Street from Friday, January 3, 2019 to Thursday, January 16, 2019.**
  - **Crews will also be working days Monday to Friday 6:30 a.m. to 2:30 p.m.**

Questions, comments, and concerns: Burton Power Lines: Dwyer asked why the 136 kilovolt lines along Kamehameha Highway not being buried like other systems and Lee noted that this may be due to the space needed to safely bury the lines and call BWS customer service at 748-5030 during normal business hours.

- Questions about the Kamehameha Highway 6+/7+ - Where are they? Dwyer noted the 6+ and 7+ lines are cheaper than burrying the line. Dwyer noted that it seems discriminatory that the urban core sectors of the project are treated differently.

Arakawa joined the meeting at 7:23 p.m.; 14 members present.

Hearing requests, Chair Clark moved to Agenda Topic: Community Concerns:

- **Chair Clark handed the gavel to Vice Chair Sugimura at 7:24 p.m.**

Residents/Community Concerns:

- **Hawaii Department of Health (DOH): Red Hill Fuel Storage Center Community Input:** Chair Clark noted that one (1) of the tanks in the fuel storage system leaked 27,000 gallons of jet fuel in 2014. Chair Clark noted that the tanks sit above an aquifer that supplies half the island with fresh water. Chair Clark noted the DOH and Navy have a tentative agreement to follow the US Navy’s solution to enclose each of the storage tanks.

Chair Clark asked and Beekman noted that each of the 20 tanks has a capacity of 12.5 million gallons. Beekman said that she thought around four (4) tanks were empty. Chair Clark noted the BWS suggests that the system should utilize a double-walled system or be moved to a region where the tanks would not be over an aquifer. Chair Clark said that the BWS is opposed to utilizing an inferior protection solution. Chair Clark noted the previously mentioned rate increase and when the previous plan was to increase in regards to the Red Hill Fuel Storage System. Chair Clark asked the community for their input on Red Hill and noted his work with the BWS on the issue. Chair Clark noted a recent Star Advertiser article regarding the BWS and the Navy agreement.
Chair Clark noted that the Board could have a presentation on the topic in January 2020. Chair Clark noted that the DOH was allowing him to submit comments on Red Hill from the meeting on the Monday, December 9, 2019 deadline. Beekman asked if the Board would be able to read in the minutes of the December meeting that the NCO did not corrode the tank. Chair Clark noted that the testimony and Beekman noted that the testimony and Chair Clark noted that the Board would be able to read it in the minutes of the December meeting that the Navy was not concerned that the Navy would not want the testimony immediately. Beekman noted that the aquifer that might be affected by Red Hill fuel tank leaks supplies 25 percent of Oahu’s water, from Moanalua Valley to Hawaii Kai. Dwyer noted his understanding of a Red Hill Fuel Storage System tour and stated that he was impressed by the system. Dwyer asked while on the tour how many fuel systems across the island are scrutinized like the Red Hill system and Dwyer noted that was the only question that the Navy would not answer, with one (1) of the guides replying that he didn’t want to comment on anything else’s people. Dwyer was impressed by their closed security system and noted that the 2014 leak was caused by contractor error. Dwyer noted that there may not be a quick solution to this concern and stated that the community may not like the solution chosen. Beekman noted that a map of the island aquifer appears to show that approximately 95 percent of the island is above an aquifer and noted that the remaining areas would likely not affect the protection of the present underground location. Beekman noted that the Navy could decide to relocate the Red Hill tanks somewhere other than Oahu, taking the ships and planes that need that fuel with them, resulting in lost jobs on Oahu. Tsuji noted that closing Pearl Harbor would drastically affect the economy on Oahu. Beekman noted that the tanks were built to have concrete flush against the tanks all the way to flush against the basalt rock of the mountain for protection. Beekman noted that the concrete used on the system was the same type of concrete used for the Hoover Dam, which has never leaked. Beekman noted that fuel was never found in our drinkable water source to the point where it had to be filtered. A resident noted that the tank’s failure was caused by contractor error. Francie Whitfield noted that the system can function via gravity due to its design, elevation, and location. Whitfield noted that the Red Hill fuel tanks and the Department of Defense (DOD) supported the Big Island’s fuel needs during the volcano eruptions. A resident asked how the tanks would be affected by an earthquake rated level five (5) or six (6) on the Richter scale. The resident asked if the Navy could use fewer tanks or what would be the optimal amount of tanks needed. Beekman noted that this is why the Navy has four (4) tanks emplaced and stated that she didn’t know if they would be removed. Beekman noted her experience with earthquakes on the Big Island and stated that Oahu has less seismic activity. Beekman noted that she was unsure if there have been any earthquakes in recent history that would have affected the tanks had they been there. A resident noted that the tanks may not be up to current codes due to the age of the tanks. A resident asked if an even level of fuel across all 20 tanks would lessen the pressure on the tanks. Beekman noted that the tanks were designed to withstand the amount of pressure in them. The resident noted that higher amounts of pressure lead to cracks. A resident showed a picture of one options for a double-walled storage system. Ribiella, Councilmember Fukunaga’s Senior Advisor, noted that the Department of Health (DOH) is determining which option the Navy will need to follow. Ribiella noted Councilmember Fukunaga’s support of a double-walled system and stated her opposition to the proposed 2045 deadline for the Navy. Ribiella noted precedence for the Navy moving their storage system and supports the BWG’s position. Chair Clark noted that Fukunaga had asked for a single-walled system and was Ribella noted that the Navy would be better suited to accommodate. Beekman noted that the Navy would empty the tanks after 2045 if no double-walled solution is found and stated that a double-walled system is currently not viable because of the immense size of the tanks. Burg noted the size of the project and stated that there are signs of sinking and corrosion. Beekman noted the BWG’s mission to protect Oahu’s water for future generations. Burg noted that BWG would not want to be responsible for a potential disaster. A resident noted the importance of determining that the fuel of that the Navy would need before an option is determined. Kimball noted that the Navy was impressed by the Navy’s fuel systems and stated that moving them probably isn’t an option. Kimball noted that the need to utilize a different deadline for the Navy project and stated that 2045 is too long of a timescale. Arakawa noted that he would support a presentation on the topic in order to garner information. Arakawa noted that the community needs to get their answers directly from the source. Kim noted his stance that the system needs to be moved to protect future generations. Chair Clark noted that this is dangerous for the community and stated that the Navy Stadium Authority allows this to occur. Deputy Director Ho will take the request to the Department of Transportation Services.

Questions and comments followed:
1. Talk Story: Beekman asked and Garcia noted that the talk story will be on Saturday, December 21, 2019 from 6:30 p.m. until 8:30 p.m. at Waiau Elementary School.
2. Red Hill Fuel Storage System: Garcia noted that Congressmen Case has been tracking concerns and public comments on the Red Hill Fuel Storage System. Garcia noted the Monday, December 9, 2019 deadline for public comments and stated the Monday, December 16, 2019 deadline for future change of the underground fuel storage system. Beekman asked and Garcia noted that public comments for the Red Hill Fuel Storage Systems should be sent to the Department of Health (DOH). Garcia noted that Congressman Case and Congressman Schatz are on the committees for military construction. A resident asked what they can do in January 2020 after the rule change meetings. Chair Clark noted that the public can attend the rule changes meeting. Arakawa noted that the discussion and vote can still occur. A resident asked if the rule changes meeting can be held in Aiea and Garcia noted that they cannot change the location. Kim asked Case’s position on having the Red Hill Fuel Storage System and Garcia noted that they are waiting for the Environmental Protection Agencies (EPA) comment. Kim noted that the decisions could be made without his comment and Garcia asked that the public submit comments online.

Mayor Kirk Caldwell’s Representative: Mayor Kirk Caldwell’s Representative: No representative was present; no report was given.

Vice Chair Sugimura handed the gavel to Chair Clark at 8:01 p.m. Hearing no objections, Chair Clark returned to Agenda Topic: Elected Officials.

Questions and comments followed:
1. Talk Story: Beekman asked and Garcia noted that the talk story will be on Saturday, December 21, 2019 from 6:30 p.m. until 8:30 p.m. at Waiau Elementary School.
2. Red Hill Fuel Storage System: Garcia noted that Congressmen Case has been tracking concerns and public comments on the Red Hill Fuel Storage System. Garcia noted the Monday, December 9, 2019 deadline for public comments and stated the Monday, December 16, 2019 deadline for future change of the underground fuel storage system. Beekman asked and Garcia noted that public comments for the Red Hill Fuel Storage Systems should be sent to the Department of Health (DOH). Garcia noted that Congressman Case and Congressman Schatz are on the committees for military construction. A resident asked what they can do in January 2020 after the rule change meetings. Chair Clark noted that the public can attend the rule changes meeting. Arakawa noted that the discussion and vote can still occur. A resident asked if the rule changes meeting can be held in Aiea and Garcia noted that they cannot change the location. Kim asked Case’s position on having the Red Hill Fuel Storage System and Garcia noted that they are waiting for the Environmental Protection Agencies (EPA) comment. Kim noted that the decisions could be made without his comment and Garcia asked that the public submit comments online.

Governor David Ige’s Representative: No representative was present; no report was given.
Senator Breene Harimoto: Linda Nunes was present; she disseminated Senator Harimoto’s monthly report:

- Legislative Update: Nunes noted that the 2020 Legislative Session will begin on Wednesday, January 15, 2020.
- Legislative Priorities:
  - Term Limits: Plans to reintroduce a bill that would call for a constitutional amendment to enact a term limit on the State Legislature, consisting of three (3) consecutive full four (4) year terms for senator and six (6) consecutive full two (2) year terms.
  - Referendum: Plans to reintroduce a bill calling for a constitutional amendment to provide for referendums allowing direct legislative enactment by the voting public.
- Road Usage Charge: The Department of Transportation (DOT) is investigating the possibility of implementing a road usage charge (RUC) to make up for anticipated reduction in gas tax revenue.
- Contact Information: Please contact Senator Harimoto at 586-0230 or via email at sbhrimoto@capitol.hawaii.gov for more information.

Representative Aaron Ling Johanson: Representative Johanson exited the meeting due to health concerns; his monthly report was disseminated.

Representative Romy Cachola: Representative Cachola distributed his newsletter; reported the following:

- Legislative Update: Representative Cachola noted that Wednesday, January 15, 2020 is the opening of the legislative session and asked the community to visit room 406 for refreshments.
- Halawa Valley Estate: Representative Cachola noted that no work has been completed to improve the concrete drainage ditch by the City and County of Honolulu and stated the need for government intervention.
- Halawa Stream Update: Representative Cachola noted that they are awaiting United States Army Corps of Engineers (USACE) approval for any movement on the project.

Representative Sam Kong: Representative Kong was present; the following report was given:

- Legislative Update: Representative Kong noted that Wednesday, January 15, 2020 is the opening of the legislative session and asked the community to visit his room for lunch and refreshments.
- Contact Information: Please contact Representative Kong at 699-0222. Representative Kong asked that the community contact him with any legislative ideas for the 2020 session.

District 6 Councilmember Carol Fukunaga: Ribella was present; Councilmember Fukunaga’s monthly report was disseminated:

- ‘Monster Home’ Enforcement Package:
  - Ribella introduced the “Monster Home” enforcement package consisting of Bill 65 (19), Bill 66 (19), Bill 67 (19), and Resolution 19-325. Please contact Senior Advisor Ribella at knickel@honolulu.gov or at 766-0445 if you have questions or are willing to submit testimonies on the matter. Councilmember Fukunaga's office is seeking support for the bills to be heard during Council meetings in January 2020.

District 7 Councilmember Joey Manahan: Anela Kekio’okānani was present; Councilmember Manahan’s monthly report was disseminated.

District 8 Councilmember Brandon Elefante: Councilmember Elefante was present; the following report was given:

- Resolution 19-276: Council Chair Saika Anderson and Councilmember Elefante co-introduced Resolution 19-276, which urges the City and County of Honolulu’s Department of Parks and Recreation (DPR) to hire dedicated groundskeepers for each community park.
- Resolution 19-295: The Honolulu City Council adopted Resolution 19-295, which requests the City and County of Honolulu’s Department of Transportation Services (DTS) to work with the State Department of Transportation (HDOT) to study and analyze the potential use of contraflow lanes in the Waipahu, Pearl City, and Aiea travel corridors.
- Honolulu City Lights: Councilmember Elefante asked that the community please visit Honolulu City Lights and stated that the theme is “Sweet Island Home.”
- Pearl Harbor Historic Trail: Councilmember Elefante thanked Congressman Case for assisting with the completion of the Pearl Harbor Historic Trail to the Arizona Memorial.

REPORTS BY BOARD MEMBERS REGARDING OTHER MEETINGS: The following reports were given:

- Pearl City Neighborhood Board No. 21: Beekman noted her attendance at the November 2019 Pearl City Neighborhood Board No. 21 Regular Board Meeting. Beekman stated that the meeting topics consisted of fireworks and a house that has squatters that cannot be removed.
- Alamanu/Foster Village/Salt Lake Neighborhood Board No. 18: Beekman also noted her attendance at the November 2019 Alamanu/Foster Village/Salt Lake Neighborhood Board No. 18 Regular Board Meeting. Beekman noted that the Chair of the Kupuna Committee was concerned about the large increases discussed at the County Council level for kupuna bus passes.
- Red Hill Fuel Storage Meeting: Luana Whitfield noted her attendance at the Red Hill Fuel Storage System Meeting and noted that the community was able to receive information from the Administrative Order of Consent (AOC). Luana Whitfield noted that the community can contact her for assistance in signing up for a Red Hill Fuel Storage System tour. Luana Whitfield noted her attendance at Moanalua High School in regards to the Red Hill Fuel Storage System and noted community opposition to the system’s presence. Luana Whitfield noted the community’s desire to empty the fuel storage system. Luana Whitfield noted her attempts to find a meeting in January 2020 for the Red Hill Fuel Storage System. Beekman noted that the Salt Lake Neighborhood Board No. 18 and Pearl City Neighborhood Board No. 21 have regular meeting updates from Naval Facilities Engineering Command (NAVFAC).

COMMITTEE CONCERNS: None were heard at this time.

Tsui exited the meeting at 8:31 p.m.: 13 members present.

APPROVAL OF REGULAR MEETING MINUTES: Hearing no objections, the September 2019 and October 2019 Regular Meeting Minutes were ADOP TED AS AMENDED by UNANIMOUS CONSENT, (13-0-0).

Amendments are as follows:
- September 2019: On page five (5), under Resolution 19-136: Approving an Application for a Plan Review Use Permit (PRU) Permit for the Relocation of Oahu Community Correctional Center (OCCC) to Halawa, it should read, “Tsui recused himself from the Agenda Topic due to a possible conflict of reasoning.”
- October 2019: On pages six (6) and seven (7), under Conditional Use Permit (CUP), 98-679 Alipoe Drive, it should read, “Resident C. Arakawa.”

Tsui joined the meeting at 8:33 p.m.: 14 members present.

BOARD BUSINESS

Update of Resolution 19-136: Approving an Application for a Plan Review Use Permit for the Relocation of Oahu Community Correctional Center (OCCC) to Halawa: Update of the status of the Plan Review Use (PRU) Permit Application to relocate OCCC to Halawa submitted by the State’s Department of Accounting and General Services and Department of Land and Natural Resources: Chair Clark, Councilmember Fukunaga, Erring, and Mernt. Mehern was present; the following presentation was given:

- Project Update: Mehern noted that they will be using a local architecture firm for the new OCCC project. Mehern noted that the current OCCC location is nearly 45 years old and is in need of multiple infrastructure upgrades. Mehern noted that five (5) years ago the Department of Accounting and General Services (DAGS) was funded in order to find a solution to these OCCC concerns. Mehern noted that this lead to the studies and environmental impact study (EIS) process that was accepted by Governor Ige. Mehern noted Governor Ige’s desires to utilize the previous animal quarantine sites in Halawa. Mehern stated his desire to be on the Board’s January 2020 and February 2020 agendas to detail their plans before the next City Council of Honolulu full council meeting. Director Espinda noted that other urban facilities have been operated previously.

Questions and comments followed:

1. Project Details: Tamamoto asked and Director Espinda noted that the project is designed to contain 1,300 beds. Director Espinda noted that the female OCCC modules have been moved to the Kailua Women’s Community Correctional Center. Director Espinda noted that the proposed OCCC would not have any women residents. P. Kim asked and Director Espinda noted that the site would have a large mental health center. Tamamoto asked and Director Espinda noted that they may be able to downsize the project. P. Kim asked if the structure will be built vertically or modularly. A representative noted that OCCC is proposed for only four (4) stories. Director Espinda noted their attempts to have public transportation services to the jail. A representative noted that they would need to include a region large enough for the buses to turn around.
Tamamoto asked if there will be on-site parking or if there will be an area to create a private shuttle service. Director Espinda noted their attempts to not affect the current amount of traffic. Tamamoto asked if a shuttle service could be implemented and Director Espinda stated that the need to garner more community input. A resident asked and Director Espinda noted that 1,300 inmates is part of the projected inmate population. Tamamoto asked if Director Espinda noted that he was in attendance to answer questions from the community. Sugiura asked if the final decision on the project has been made and representatives noted that Governor Ige decided on the project last year. Sugiura asked why the Federal Detention Center is being considered and Director Espinda noted that the federal center would need to be purchased. Director Espinda noted that they must strive for the Halawa and federal locations to continue the conversation with the community and stated that this was needed to potentially complete the project. Tamamoto noted that the original 10 million dollars is still funding the project.

2. Waiakea Correctional Facility: Imamura-Urusu asked where the Waiakea Correctional Facility prisoners are housed and Director Espinda noted that they are housed within a 100 acre property.

3. Length of Stay: Tamamoto asked how many of the prisoners have been there less than a year or are awaiting sentencing. Director Espinda noted that 800 prisoners are awaiting trial and stated that the number would be higher if it included individuals awaiting bail payments. A resident asked and Director Espinda detailed that prisoners with extended stays are shipped to prisons on the mainland. Director Espinda noted that OCCC is a jail and not a prison.

4. Plan Review Use (PRU): Tsuji asked if the PRU is needed and Director Espinda noted that the PRU is required to move forward with the project. Arakawa asked if a Board motion is part of the permitting process and Director Espinda noted that he was giving the community an update. Director Espinda noted that the project does not need a Board motion. Mehrnet noted that they have been giving presentation to the community since 2016 and stated that the community desired more information. Chair Clark noted that the project would need Board support for the PRU. Mehrnet noted that the PRU allows the project to move forward and stated their future plans for community meetings. Sugiura noted that the PRU discussion is premature due to the lack of a final decision on the matter. Sugiura asked and Director Espinda noted that the PRU does not need additional funds for its completion. A representative noted that the PRU has been completed and is awaiting acceptance. The representative noted the need to assure that the project is actionable once it’s completed.

5. Opposition: Arakawa noted his previous motion in opposition of the project and stated the need to prudently work on all potential plans. Arakawa noted that Board support would allow the process to move forward. Arakawa noted that additional questions and comments for the project can be levied at the City Council. Tamamoto noted her safety concerns with the proposed site. Tamamoto asked for assurances to minimize the amount of prisoners and increase the amount of prisoner services.

Arakawa MOVED and Tsuji SECONDED the motion to SUPPORT the State Department of Accounting and General Services (DAGS) Plan Review Use (PRU) Permit application process for the Waiakea Correctional Facility to move forward at the City Council. The MOTION PASSED by HANDS VOTE. (11-1-2). (Ay: Fatafehi, Fitch, Kimball, Beekman, Imamura-Urusu, Whitfield, Dwyer, Mizusawa, Arakaki, Mohawki, and Arakawa; Nay: Sugiura; Abstain: Clark and Tsuji).

Tsuji focused himself from the Agenda Topic due to a possible conflict of reasoning.

Update of the Aloha Stadium Redevelopment Project—Act 269 appropriated $350 million for the Aloha Stadium redevelopment project. This Act will convert the stadium into a mixed-use sports and entertainment district, and hand jurisdiction of Aloha Stadium lands over to the Stadium Authority, while authorizing the Hawaii Community Development Authority (HCDA) to facilitate the redevelopment. Kimkama Department of Accounting and General Services (DAGS): Kimkama was present; the following report was given:

1. New Aloha Stadium Development District (NASED) Update: Kimkama reported that their initial EIS commenting period has closed on Thursday, November 7, 2019 and stated that they are currently analyzing their community input before their official draft EIS is submitted in 2020. They will have a meeting on Wednesday, December 18, 2019 at Aloha Stadium from 7:00 p.m. to 9:00 p.m. at the Aloha Stadium Hospitality Center. Kimkama stated that the community should submit additional comments at the meeting. Kimkama noted that they will be in attendance of the Awa Community Association’s (AACA) Christmas Parade.

Questions and comments followed:

1. Traffic Studies: Dwyer asked if Moanalua Road and Salt Lake Boulevard could be studied for transit and traffic mitigation. Kimkama noted their studies and efforts to improve traffic within the region. Imamura-Urusu noted the need to have better coordinated public transportation in order to have better community attendance. Kimkama noted their efforts with the Department of Transportation Services (UDT) to have involved bus and rail systems in the region.

2. Community Concerns: Tamamoto noted that HCC will attend their future meetings and Kimkama noted that HCC will attend their future meetings. Kimkama noted that their previous submission was a draft and stated that all future community concerns will be answered.

3. Project Location: Arakawa asked if there would still be areas for the State Fair. Kimkama noted that it is depending on the project’s master plan and stated their attempts to build near the rail system in order to create a central hub.

4. Meeting Location: Tamamoto asked for the location of the Aloha Stadium Hospitality Center. Kimkama stated that residents could visit the Aloha Stadium ticket center to be shown to the meeting center.

Mizusawa exited the meeting at 9:21 p.m.; 13 members present.

“Save Ala Moana Beach Park Hui” discussing the current plans of constructing a “playground” within the Ala Moana Beach Park. No representative was present; no report was given.

Mizusawa joined the meeting at 9:23 p.m.; 14 members present.

City and County Office of Climate Change, Sustainability and Resiliency (CCSIR) presentation of the update of the Oahu Resilience Strategy and the progress of the office has been making toward mitigating carbon emissions and adapting to the impacts of climate change on Oahu. The following report was given:

- About the CCSIR: The CCSIR was created to improve the City and County of Honolulu’s environmental and sustainability performance and coordinate with other agencies to help mitigate and adapt to the effects of climate change on Oahu. Our ultimate goal is to protect and improve the lives of Oahu residents by creating more resilient infrastructure and communities. We do this by improving City policies that help communities knit closer bonds and prepare themselves for the inevitable impacts of climate change, accelerating the shift to a 100 percent renewable energy society as quickly as possible, and strengthening our local Oahu economy by importing less, reusing more, and increasing self-sufficiency.

- Resilience Plan: The CCSIR’s resiliency strategy was adopted by the Honolulu City Council by Unanimous Consent and can be found online at https://www[resilientoahu.org]. The CCSIR’s annual sustainability report can be available in spring 2020.

Tsuji exited the meeting at 9:28 p.m.; 13 members present.

Questions and comments followed:

1. Potential Changes: Beekman asked if policy changes could be potentially made. The CCSIR noted their attempts to apply better zoning codes and hurricane retrofitting programs. The CCSIR noted their attempts to lower construction costs. The CCSIR noted their four (4) pillars: remaining rooted, bouncing forward, climate security, and community cohesion.

2. Additional Information: Beekman asked if their documents can be found online and the CCSIR noted that it can be found on their website, https://www[resilientoahu.org].

Tsuji joined the meeting at 9:30 p.m.; 14 members present.

Kaahuele Neighborhood Park: Chair Clark noted an issue with the Board’s previous letter to close the Kaahuele Neighborhood Park due to an incorrect name. Dwyer noted a need to better detail the park. Chair Clark noted a need to contact the Home Owner’s Association (HOA).

Dwyer MOVED and Fatafehi SECONDED the motion to close the park adjacent to the Newton Recreation Center, the MOTION PASSED by UNANIMOUS CONSENT, (14-0). (Clark, Sugiura, Fatafehi, Fitch, Kimball, Beekman, Imamura-Urusu, Whitfield, Dwyer, Mizusawa, Tsuji, Arakaki, Mohawki, and Arakawa; Nay: None; Abstain: None.)
In accordance with the Rules of the Neighborhood Plan Chapter 14 section 2.14.111, the board will determine whether the following two (2) items should be placed on the January 2020 agenda:

- Whether the Aiea Neighborhood Board meetings should be taped and aired on Ooloi. Beekman and Chair Clark.
- To create a new committee to be called the “Real Science Climate Change Committee”. The goal of this committee is to keep track of climate change facts, local climate change activities and their effect on the people of Hawaii”. Beekman and Chair Clark.

Chair Clark handed the gavel to Vice Chair Sugimura at 9:37 p.m.

Discussion followed:

1. **Meeting Transparency**: Beekman noted the need to have videotape of the meeting in order to better disseminate information to the community. Imamura-Ururu asked that the meetings be recorded by Ooloi. Chair Clark noted previous Board opposition to videography due to individuals grandstanding or being shy in front of the camera. Tsuji noted his concerns about residents’ privacy due to potential retaliation. Arakawa noted previous Board members being threatened. Arakawa stated that the Aiea Neighborhood Board No. 20 is run well and noted his agreement with Tsuji and Chair Clark. Dwyer agreed with Arakawa.

2. **Cost**: Dwyer asked and Chair Clark noted that the Board would need to pay for the videography service. Chair Clark asked and Naylon noted that the videography service would cost $2,400 annually. Vice Chair Sugimura asked and Tasutomoto noted that the funds would be allocated to the Board via the Neighborhood Commission Office (NCO). Tamamoto noted that Ooloi contracts their videographers for a set amount of time per meeting. Vice Chair Sugimura asked and Tamamoto noted that there are other individuals that film the meetings. Beekman noted that the videographer at a Neighborhood Board meeting she attended said he was a private contractor working for Ooloi.

Beekman MOVED and Imamura-Ururu SECONDED the MOTION for the Aiea Neighborhood Board No. 20 to include the motion for the videotaping and broadcasting of their Regular Board Meetings to the July 2020 Regular Board Meeting Agenda. The MOTION FAILED by HANDS VOTE, (4-10-0). (Beekman, Imamura-Ururu, Whitlefield, and Mortwaki; Nay: Clark, Sugimura, Fatafushi, Fitch, Kimball, Dwyer, Mizusawa, Tsuji, Arakaki, and Arakawa; Abstain: None.)

Tsuji exited the meeting at 9:46 p.m., 13 members present.

Beekman MOVED and Kimball SECONDED the MOTION to create a new committee to be called the “Real Science Climate Change Committee”.

Discussion followed:

1. **Committee Details**: Beekman noted the need to have a committee that disseminates the actual information in regards to climate change. Arakawa stated the need to have two (2) sides of the information detailed but noted that the current system suffices. Arakawa noted that the Board could create a Permitted Interaction Group (PIG) with the purpose of working in opposition of CCSR. Beekman noted the need to create a committee instead of a PIG due to the concerns on-going nature. Beekman noted the need to study potential positives of green energy plans moving forward. Kimball agreed with the need to track the green energy process. Chair Clark noted that climate change is meant to be handled by experts and stated that lack of expertise within the proposed committee. Chair Clark noted his desire to focus the Board’s committees on the Aea community. Beekman noted that the CCSR only tells a one (1) sided narrative and stated that she would be using scientifically based evidence throughout the committee. Arakawa noted the need to have more technical involvement in the CCSR commission and stated the need for more experts on the commission. Beekman noted that many experts are politicized.

2. **City and County of Honolulu Concerns**: Arakawa noted that the City and County of Honolulu’s most pressing concerns are affordable housing and homelessness. Arakawa noted his concerns with the younger generations moving away from Hawaii due to the high cost of living. Arakawa noted the need to handle more immediate concerns.
interfere with refuse collection. Deputy Director Ho noted that the utility poles are owned by a company and that there are identification tags on them.

Board of Water Supply (BWS): Tracy Burgo reported the following:

- **December 2019:** There were no main breaks to report.
  - Saturday, October 26, 2019: An eight (8) inch main broke at 98-1396 Aakaia Street, Aiea.

**General Water Announcements:** Meter Reading Equipment Replacement Project: The BWS has contracted Robertson & Murphy Contracting Company to replace meter transponder units in water meter boxes throughout Oahu. The BWS has been gradually replacing them and, when finished, this project will increase the efficiency of automated meter reading processing: notifying area customers one (1) to two (2) weeks prior to the work. The BWS will notify customers when boxes are scheduled for replacement.

- **Follow Up:** Revenue Percentages: Burgo noted that prior to the current rate schedule, the last rate increase was on Friday, July 01, 2020. Burgo noted that the new rates have a proposed revenue increase on two (2) percent. Burgo stated that a complete revenue report would need to wait until after June 2020 and the end of the fiscal year.

**Questions and comments followed:**
1. **Star-Advertiser Article:** Beekman asked about the Star-Advertiser article in regards to BWS and Burgo stated that the concern is under review by their lawyers. Beekman asked for additional information and Burgo will report back.
2. **Pesticide Levels:** A resident asked if pesticide contamination levels in BWS water wells have lowered and BWS noted that they have not seen any lowering in their contamination numbers. A resident asked if BWS noted that the wells on agricultural lands have lowered and BWS noted that there is chemical competition that slows the rate of contamination in the wells. A resident asked if BWS noted that they have the technology to remove contamination effectively depending on the levels on contamination.
3. **Water Main Break:** Chair Clark asked about a water main break that occurred on Tuesday, January 7, 2020 and stated that there were large amounts of debris left along the roadway. Chair Clark asked that the Kaaoloe Street region is revisited.
4. **Control Panel:** Tamamoto asked about the control panel at the Sugar Mill Field and asked if the community should call BWS after hours. BWS noted that they have a 24 hour hotline at 748-5000. Burgo noted that they have contacts in the Department of Parks and Recreation (DPR) in case of emergencies.

Imamuru-Uruju joined the meeting at 7:30 p.m.; five (5) members were present.

Honolulu Rail Transit Project (HART): Pat Lee of the Honolulu Authority for Rapid Transportation (HART), Jason Tayros (Nam Inc.), and Danny Rosario (Road and Highway Builders (RHB)) reported the following:

**Rail Update:** Happy New Year! Big things are planned for the Honolulu Rail Project this year, 2020. The final leg of the current rail alignment, the City Center segment which includes 4.1 miles of guideway structure and 8 stations from Middle Street to Ala Moana Center is planned to be awarded as a public private partnership, P-3, contract by summer. The $1.4B contract would also include the Pearl Highlands parking structure and transit center and the operations and maintenance contract for the rail system for a period of up to 30 years. Meanwhile, the utility relocation work in the City Center will proceed with Dillingham Boulevard the immediate focus with both day and night time work to come. This accelerated schedule for the utility relocation and building the guideway and stations could shave off 16 months of time for construction work through Kalihi.

**Public Outreach:** HART plans for an extensive outreach program to the area to keep both residents and businesses fully informed of the work schedules and other important information on construction activities and construction moves through Kalihi. HART will be holding a Community Train Day at the Halalani station at

Oahu’s Neighborhood Board system – Established 1973
Leeard Community College (LCC) on Saturday, February 8, 2020 from 10:00 a.m. to 3:00 p.m. Parking for the event is free at LCC. The public can view the train and get a first glimpse at the train station.

Introductory Service: And finally, HART and the City are working together to prepare for an initial opening of passenger service of the Honolulu rail system prior to launching full service. The City’s Department of Transportation Services (DTS) will be in charge of operating and maintaining the rail system along with the bus and the handivan. Train testing is underway in preparation for Introductory Service, which will be between the Kualoa Station (East Kapolei) and the Hatala Station (Aloha Stadium) is targeted to start by the end of this year. This would include nine stations from Kapolei near the Kroc Center, through Waipahu, Pearl City and Aiea, and include stops serving University of Hawai‘i West Oahu (UWWO), LCC, Pearlridge Mall and the Aloha Stadium.

Poster Contest: The annual HART Poster Contest is underway, and it is open to all Oahu high school students in 9th to 12th grades attending public, charter, private or home school. Posters are due on Friday, March 13, 2020. Entries may be mailed or dropped off at the Honolulu Authority for Rapid Transportation (HART) at 1099 Ala Moana Boulevard, 17th Floor, Honolulu, HI 96813. Entries may also be dropped off at any Hawaii Public Library on Oahu between Monday, February 24, 2020 and Friday, March 13, 2020.

Kamehameha Highway Work Notice (Eastbound): In early February 2020 there will be an estimated three (3) night closures of Kamehameha Highway from 9:00 p.m. until 6:00 a.m. The closure will be between Kamuku Street and Kaonohi Street. Eastbound traffic on Kamehameha Highway will be detoured at Hekahou Street. The eastbound sidewalk will also be closed with a pedestrian detour in place on the westbound side of Kamehameha Highway. The bus stop near Best Buy will not be serviced during the closure, and the Kaonohi Street bus stop will be relocated to near Lex Brodie’s. For safety, please observe posted speed limits, traffic directional signs, and other special instructions. For up-to-date bus information, visit www.TheBus.org or call (808) 948-5555.

Kamehameha Highway Work Notice (Westbound): In mid-February 2020 there will be an estimated week long closure of the westbound section of Kamehameha Highway. The road closure will be along Salt Lake Boulevard weekend nights from 9:00 p.m. until 5:00 a.m. The westbound sidewalk will be closed for pedestrians a detour in place on the eastbound side of Kamehameha Highway. The westbound Kamehameha Highway bus stops will not be serviced during the closure. The stops at Salt Lake Boulevard inbound and outbound will be used. For safety, please observe posted speed limits, traffic directional signs, and other special instructions. For up-to-date bus information, visit www.TheBus.org or call (808) 948-5555.

Kamehameha Highway Work Notice (Full Closure): There will be a full closure of Kamehameha Highway westbound between Kaonohi Street and Kamuku Street. The closure will occur in early February 2020 and will take approximately three (3) nights. Kamehameha Highway will be closed westbound at Kaonohi Street from 9:00 p.m. until 6:00 a.m. The westbound sidewalk will also be closed with pedestrian detour in place on the eastbound side of Kamehameha Highway. For safety, please observe posted speed limits, traffic directional signs, and other special instructions. For up-to-date bus information, visit www.TheBus.org or call (808) 948-5555.

Kaonohi Street: Rosario noted that RHB will be working on the infrastructure at the intersection of Kaonohi Street. Rosario noted that they will be working to repave the region during January 2020 until the beginning of February 2020. Rosario noted that the work should be completed by March 2020. Rosario asked that the community contact him at 285-2540 for any questions or concerns pertaining to the project.

Contact Information: For more information, please visit the HART website at www.honolulutransit.org, you can call the project hotline at 1-866-2209 or email a question to info@honolulutransit.org.

ELECTED OFFICIALS:
Congressional Representative Ed Case: No representative was present; no report was given.

Governor David Ige’s Representative: No representative was present; no report was given.

Mayor Kirk Caldwell’s Representative: Department of Information Technology (DIT) Deputy Director Keith Ho was present to field questions from the community:
- Parking Queue: The DTS reported that loading zones around the stadium are not under the DTS’ jurisdiction. DTS suggested that the concern is referred to the state or stadium authority; taxi companies may have an agreement in place.

Questions and comments followed:
1. Parking Queue: Tamamodo asked if the City and County of Honolulu can follow-up with the state in regards to the concern with parking along Salt Lake Boulevard. The stadium authority noted that they apply for annual contracts with the HPD in order to gather permission to zone off the roadway for the fronting Aloha Stadium for ride-share services. Tamamodo asked and the stadium authority noted that the public can use these regions for drop-offs too. The stadium authority noted that they have cautionary signs for the region and stated that it is monitored.
2. Sugar Mill Park: Tamamodo asked that the matter at Sugar Mill Park (Aiea Interim Park) is investigated due to the control panels being broken.

Senator Donna Mercado Kim: Senator Kim was present; the following report was given:
- Legislative Session: Senator Kim noted that the legislative session will begin on Wednesday, January 15, 2020 and stated her commitment to serve the community.
- Committee Seats: Senator Kim will be the chair of the Higher Education Committee, which oversees programs related to the University of Hawai‘i (UH) and the community college system. Senator Kim will be the vice chair of the Education Committee and will be a member of the Judiciary Committee. These committees will continue to scrutinize their respective budgets to strive efficiency and eliminate wasteful spending.
- Public Access Room (PAR): The PAR was established to provide free services and resources to assist members of the public that are interested in getting involved in the legislative process. Workshops and tutorials on the legislative process are offered, and staff are available to answer questions about the process of submitting testimony. Please contact the PAR at (808) 587-0478 or via email at par@capitol.hawaii.gov.
- Community Bulletin: Please look out for Senator Kim’s spring community bulletin in the mail in the next few weeks. The bulletin contains articles, a community survey, as well as a 2019 recap of community events.

Senator Breene Harimoto: Linda Nunes was present; she disseminated Senator Harimoto’s monthly report:
- Legislative Update: Nunes noted that the 2020 Legislative Session will begin on Wednesday, January 15, 2020.
- Committee Seats: Senator Harimoto will be a vice chair of the Transportation Committee. Senator Harimoto will be a member of the Public Safety, Intergovernmental, and Military Affairs Committee and the Ways and Means Committee.
- Contact Information: Please contact Senator Harimoto at 586-6230 or via email at senharimoto@capitol.hawaii.gov for more information.

Beekman exited the meeting at 7:48 p.m.; four (4) members present.

Representative Aaron Ling Johanson: Representative Johanson was present; the following report was given:
- Legislative Tracking: Representative Johanson noted that the legislative website can be found at www.capitol.hawaii.gov. Residents can use the website to track their local representatives by inserting their address into the search bar on the upper right-hand corner. By using the “keyword search” box on the left-hand side of the screen, residents can locate bills by subject matter.
- Committee Seats: Representative Johanson will be a member of the Economic Development & Business Committees and the Lower & Higher Education Committee.
- Kupuna Services: Representative Johanson will be looking into kupuna financial services and public safety.
- Aloha Stadium Board: Representative Johanson is attempting to get a community member from the Aiea region to be a member of the Aloha Stadium Authority Board.

Beekman entered the meeting at 7:48 p.m.; five (5) members present.

Representative Romay Cachola: Representative Cachola was present; the following report was given:
District 8 Councilmember Brandon Elefante: Councilmember Elefante was present; the following report was given:

- National Transportation Committee: Councilmember Elefante is a member of the National League of Cities member and part of their Transportation and Infrastructure Committee.
- Committee Membership: Councilmember Elefante will Chair the Transportation Committee, be vice chair of the Budget Committee, and will be a member of the Executive Matters and Legal Affairs Committee, Parks, Community Services, and Intergovernmental Affairs Committee, and the Zoning, Planning, and Housing Committee.
- Oahu Metropolitan Planning Organization (OMPO) Chair: Councilmember Elefante noted that this time as OMPO Chair has ended. Councilmember Elefante noted that a new Chair will be selected in January 2020.
- Homeless Outreach and Navigation for Unsheltered Persons (HONU): Councilmember Elefante noted that HONU has been able to obtain services for dozens of people and asked that the community call the Office of Housing at 768-4675 for more information.

Questions and comments followed: Homeless: A resident asked about homeless individuals living near the Pearl City McDonald’s. Councilmember Elefante noted that the Hawaii Department of Transportation (HDOT) has had encampments within the region with the assistance of HPD. Councilmember Elefante noted their attempts to get these individuals proper assistance and services.

ATTENDANCE AT OTHER MEETINGS:

- New Aloha Stadium Entertainment District (NASED): Luana Whitfield noted her attendance at the NASED community meetings and noted that the community was able to give their input on the NASED project in more detail.
- American Civil Liberties Union (ACLU): Beekman noted her attendance at the ACLU’s annual meeting, where they spoke about their legal agenda for the upcoming year. One (1) of the topics covered was the potential lowering of bail.
- Democratic Party: Beekman noted her attendance at a Democratic Party presentation in regards to climate change and global warming. Beekman noted that she recorded the meeting and the video of the meeting will be posted on Oeto. Beekman noted that the process for the 2020 presidential nomination was detailed at the presentation.

APPROVAL OF REGULAR MEETING MINUTES: No action was taken due to the Board lacking quorum.

BOARD BUSINESS

Update of Resolution 19-136: Approving an Application for a Plan Review Use (PRU) Permit for the Relocation of Oahu Correctional Center to Halawa. Update of the status of the PRU Permit Application to relocate Oahu Community Correctional Center (OCCC) to Halawa submitted by the State’s Department of Accounting and General Services (DAGS) and Department of Land and Natural Resources (DLNR);

Chair Clark handed the gavel to Fitch at 8:54 p.m.

Discussion followed:
1. Public Testimony: Chair Clark asked that the community submit their public testimony in regards to Resolution 19-136 before the Council public hearing on Thursday, January 23, 2020. Chair Clark summarized the OCCC handout from Councilmember Fukunaga for the community. Councilmember Fukunaga noted that the community can contact her office to get a copy of the OCCC PRU. Tamamtoo noted concerns with the lack of community input on the project. Mehrrt noted that they do not have an update on the project and noted her appreciation for the community input.
2. Resolution Verbitage: Arakawa noted protest polls in the resolution that could blow-up the project with small variables. Arakawa noted concerns with the potential of changing the language that cannot be enforced. Arakawa noted that the community must still work with the DPP and Councilmember Fukunaga noted that the resolution was meant to start community conversation on the project. Arakawa noted the need to include the DPP on the conversation with the community. Chair Clark asked and Arakawa noted concerns with impossible terms and poison pills. Chair Clark noted that the community should get an amended version of the resolution before Thursday, January 23, 2020. Arakawa noted that additional work on the resolution would be needed to make it enforceable. Councilmember Fukunaga noted that the City Council may be willing to defer action on the resolution but stated the need to start community conversation. Lum noted that all negative language should be removed from the resolution. Chair Clark noted that many residents may be disappointed with the current version of the resolution.
3. Environmental Impact Studies (EIS): Counselor Membe noted community concern about ensuring that the EIS is followed for the project. Arakawa agreed that the EIS should comply with the project. Arakawa noted that the EIS would allow for a project that follows the parameters set forth.

4. Project Approval: Arakawa noted that the PRU should not be approved until after the project is funded. Counselor Fukunaga noted that the Department of Accounting and General Services (DAGS) may be using a number of alternative plans moving forward. Counselor Fukunaga noted that a similar process should be followed for the NASED project. Tamamoto noted that housing more than 1,300 inmates would be a breaking point for the project and asked why there are contrary inmate numbers proposed.

5. Transfer of land: Counselor Fitch asked about the transfer of land and Tamamoto noted that the City and County of Honolulu could release land for the public use if the OCCC and NASED projects come to Aiea.

6. Community Benefits: Tamamoto noted a need to game the system to get community benefits. Membe noted her attempts to have a facility that will nurture and heal their residents that need to enter their facility. Membe noted that they will have public meetings in the future to answer the community’s questions.

7. Cultural Significance: Lum stated the cultural importance of the valley and noted the heart of the community.

8. Opposition: Lum noted her opposition to having the facility within the community.

9. Inmates: Lum asked and Membe noted that many of their inmates are homeless or have mental issues. Membe noted that there is a disparity with the amount of Native Hawaiian in the system. Membe noted attempts to make their inmates healthier individuals and stated that the current facility is making the needed services. Lum asked if these services could be offered outside of the facility. Chair Membe noted that removing the female inmates from the facility was a step in the right direction for the project. Chair Membe stated that we should investigate the system New York utilizes in releasing lesser offenders. Chair Membe noted a need to have a give and take with accepting residents back into the community. Chair Membe noted poor conditions within OCCC and the need for residents to mull over the resolution. A resident noted that people make mistakes and stated that the penalty is them being removed from their families.

Fitch handed the gavel back to Chair Membe at 9:01 p.m.

Update of the Aloha Stadium Redevelopment Project—Act 288 appropriated $350 million for the Aloha Stadium Redevelopment Project. The Act will convert the stadium into a mixed-use sports and entertainment district, and hand jurisdiction of Aloha Stadium lands to the Stadium Authority, while authorizing the Hawaii Community Development Authority (HCDA) to facilitate the redevelopment. –C. Kimikawa Department of Accounting and General Services (DAGS) present, the following report was given:

- Community Meeting: Kimikawa noted that they had 50 community members attend their Wednesday, December 18th, 2019 meeting. Kimikawa noted that they recorded community input and detailed their interactive booths for the community.
- Department Cooperation: Kimikawa disseminated a summary of community comments from the meeting. Kimikawa noted that they have a significant amount of community, City and County of Honolulu, and state cooperation within the project for the community. Kimikawa noted that they have coupled with the OCCC project with their traffic plans for the region.
- Cultural Significance: Watson noted that all cultural and historical aspects are being included within the plans. Watson noted the need to remain diligent and on track during the project.

Questions and comments followed: Inmates: Lum noted that many inmates are incarcerated due to socioeconomic status or jobs. Lum stated the need to make a livable wage.

Board of Water Supply (BWS) briefing on the Red Hill Fuel Storage Facility, their findings and recommendations, –Kurota was present; the following report was given:

- Meeting Follow-up: Kurota reported that the Navy is currently working under the Administrative Order of Consent (AOC). The Navy is still completing a fuel study for the facility. The Red Hill Fuel Facility needs approximately 164 acres to operate and would need to be built over the cap rock of Oahu. There are currently 87,680 acres of cap rock within Oahu that could house the project. The BWS noted that they cannot speculate the security of the above ground fuel systems and stated that they cannot speculate on the potential of the Navy moving their facilities off island. BWS noted that previous leaks were attributed to contractor error and stated that these errors occurred during tests and repairs to the condition of the tank’s liner. There are holes in the wall that are caused by corrosion that is occurring in the backside of the tank that the Navy cannot see or fix. BWS noted that patching or coating the inside does not stop the corrosion occurring on the backside of the tank. BWS noted that groundwater and the aquifers are the same and stated that groundwater data being collected by the groundwater aquifer underneath the tanks to present day. BWS noted that as the fuel stored within the system is jet fuel and it is that has limited use for civilian fuel needs during a disaster. BWS does not have any emergency generators that operate on jet fuel. The BWS does not believe that the Navy has studied the impact of a seismic event but deferred comment to the Navy. The BWS noted that the system should have a double walled secondary containment if the fuel needs to be stored at the present Red Hill location.
- Red Hill Committee Report: Beekman, Chair of the Red Hill Fuel Tanks Committee, reported that this superior tanks are located 3.7 miles away from the fueling station and are gravity fed. Beekman noted that moving the system would greatly hinder the Navy’s ability to fuel vessels. Beekman noted that these tanks were designed to be single hulled tanks and stated that these tanks are the largest fuel suppliers in the Pacific, followed by systems in Japan, Guam, and the west coast. Beekman noted that the Navy may choose to move to a different region if the system needs to move. Beekman noted the loss of jobs with the closure of the pineapple plantations. Beekman noted that the same company that built the Hoover Dam built the Red Hill Fuel Storage System with the same materials. Beekman noted that the Hoover Dam has never leaked. Beekman noted that Morrison-Knudsen was an instrumental company in both the Hoover Dam and Red Hill Fuel Storage System projects. Beekman detailed the granulated activated, charcoal systems and noted that there are 13 of these systems island wide. Beekman noted that the Red Hill Fuel Storage System is located 100 feet below the ground.

Chair Membe handed the gavel to Fitch and exited the meeting at 9:30 p.m.; five (5) members present.

Chair Membe entered the meeting and Fitch handed the gavel at 9:31 p.m.; six (6) members present.

Questions or comments followed:

1. Groundwater: Beekman noted that fuel has not been found by the BWS in the drinking water and Kurota noted that there has been fuel found in the groundwater below the tanks. A resident asked how long it would take the groundwater to migrate to the aquifer and Kurota noted that they are awaiting a groundwater model for a better answer. A resident noted that a groundwater study was part of the Navy’s AOC for the project. A resident asked if a third party could complete the study instead of the BWS or the Navy. A resident noted that different models are an attempt to better state the data and noted he was concerned with the Navy completing the study. A resident asked and Kurota noted that their two (2) regional wells equate to 25 percent of the island’s water.

Chair Membe handed the gavel to Fitch at 9:53 p.m.

2. Cap Rock: Beekman asked and BWS noted that 23 percent of the island contains cap rock. Beekman noted that the cap rock assists in protecting the aquifers. Kurota noted that the cap rock varies in thickness and protects the aquifers. Kurota noted that Oahu’s aquifers can sustain long term use of water. A resident asked and Kurota noted that the tanks are not located on the cap rock. Tamamoto asked and Kurota noted that some of Kailua and Kaneohe are protected by cap rock. Beekman asked and BWS noted their recommendation to move the system to a region above the cap rock, similar to Campbell Industrial Park.

Fitch handed the gavel to Chair Membe at 9:57 p.m.

3. Navy Report: Flint noted that the Red Hill Fuel Storage System was a local project that had 400 local workers. Flint noted that the only failures with the project have occurred due to human error. Flint stated that the Navy has monitoring wells to inspect the ground water and fuel system. Flint noted that they are determining which of the six (6) different options with less than one (1) percent of difference in their protecting ability. Flint noted that the water is clean and safe; the Navy intends to keep it that way.

ADJOURNMENT: Due to time concerns, Chair Membe adjourned the meeting at 10:00 p.m.

Submitted By: Chris Naylon, Public Relations Assistant
Reviewed By: Lindon Valenciano, Public Relations Officer
Reviewed and Finalized By: Chair Bill Clark
DRAFT MEETING MINUTES
MONDAY, FEBRUARY 10, 2020
AIEA PUBLIC LIBRARY PROGRAM ROOM

CALL TO ORDER: Chair Clark called the meeting to order at 7:00 p.m.; quorum was established with 10 Board members present.

Note – This 15 member Board requires eight (8) members to establish quorum and to take official Board action.

Members Present: Bill Clark, Jane Sugimura, Tracy Arakaki, Stephen Wood, Ron Fitch, Pat Beekman, Francie Whitlefield, Mike Deyer, Richard Mizusawa, Jenna Moriwaki, Russell Tsuji (Arrived at 7:01 p.m.); May Imamura-Uruu (Arrived at 7:03 p.m.); and David Arakawa (Arrived at 7:23 p.m.).

Members Absent: Carolyn Kimball.

Guests: Department of Information Technology’s Deputy Director Keith Ho (Mayor Kirk Caldwell’s Representative), Shandra Delos Reyes (Representative Aaron Ling Johnson’s Office); Representative Rommy Cachola and Steven Pal (Representative Cachola’s Office); Representative Sam Kong; Councilmember Brandon Elefante and April Coloretti (Councilmember Elefante’s Office); Kim Ribella (Councilmember Carol Fukunaga’s Office); Radiant Cordero (Councilmember Joey Manahan’s Office); Lieutenant Nitta and Sergeant Siquig (Honolulu Police Department); Firefighter James Duggin (Honolulu Fire Department); Tracy Burgo (Board of Water Supply); Pat Lee (Hawaii Authority for Rapid Transit); Claire Tamamoto, Kehaulani Lum (Aiea Community Association - ACA); Chris Kihimata, Joseph Earling (Department of Accounting and General Services); Samantha Spain (Alaudo Stadium Authority); Victor Fier (NAVFAC); Rae Lou (AECHO); Sandie Abelaye (Department of Transportation Services); Vincent Shigekui (PBR Hawai’i); Josh Smead and Carley Riley (New Aloha Stadium Entertainment District); Mark Yamashita, Charlene Yamashiro, Larry Higa, Sandra Thompson (Residents); and Christopher Naylor (Neighborhood Commission Office).

Note: Name was not included if not legible or on the guest attendance sheet.

CITY MONTHLY REPORTS:
Honolulu Fire Department (HFD): No representative was present; no report was given.

Tsuji entered the meeting at 7:01 p.m.; 11 members present.

Honolulu Police Department (HPD): Sergeant Siquig was present; the following report was given:

- January 2020 Statistics: There were eight (8) motor vehicle thefts, 11 burglaries, 30 thefts, and 15 unauthorized entry of motor vehicles (UEMV).
- Safety Tip: Pedestrian Safety: When you are at a crosswalk, ensure that you obey all traffic control devices. Ensure you only cross when the control device at the crosswalk tells you to do so. Do not step into the crosswalk when the red blinking hand is illuminated or the DON’T WALK appears.

Imamura-Uruu entered the meeting at 7:03 p.m.; 12 members present.

Questions and comments followed:
1. Anson Beekman asked about an arson case in Waimalu where a squatter house was burnt down and which Department would be investigating the incident. HPD stated that the investigation is still open. Beekman asked why the house has been reported as an arson case and if this report will be changed.
2. Crime Against the Elderly: A resident asked about a recent decrease in crime against the elderly and HPD noted that they have not changed how they address these situations.

Board of Water Supply (BWS): Tracy Burgo reported the following:
- January 2020 Update: Burgo reported that there were two (2) main breaks during January 2020.
- Detect-A-Leak Week: Monday, March 16, 2020 through Sunday, March 22, 2020: Preserving and protecting our most essential resource – our water – is everyone’s responsibility. As part of our Detect-A-Leak Week (Monday, March 16, 2020 through Sunday, March 22, 2020) message, The Board of Water Supply (BWS) encourages residents to be smart water users by checking for leaks on their property as well as in fixtures and to repair them promptly. Checking and repairing leaks helps save water, lowers your water bill, and prevents potential damage to your home. During Detect-A-Leak Week, free toilet leak detection dye tablets will be available to the public during the BWS customer service counters at Pea Ridge Station between Monday, March 16, 2020 through Sunday, March 22, 2020.

Supply (BWS) encourages residents to be smart water users by checking for leaks on their property as well as in fixtures and to repair them promptly. Checking and repairing leaks helps save water, lowers your water bill, and prevents potential damage to your home. During Detect-A-Leak Week, free toilet leak detection dye tablets will be available to the public during the BWS customer service counters at Pea Ridge Station between Monday, March 16, 2020 through Sunday, March 22, 2020.

• Water Conservation Week Poster and Poetry Contest: The BWS is excited to launch its 42nd annual Water Conservation Week Poster Contest and 12th annual Poetry Contest. For 2020, the contest theme, “Creating a Sustainable Water Future,” invites Oahu students to creatively express the importance of conserving water now to preserve our water supply for the future. The poster contest is open to Oahu students in grades Kindergarten through Sixth, and the poetry contest is open to Oahu students in grades Seventh through Twelfth. The deadline to enter these contests is Wednesday, February 26, 2020 – winners will be announced in May 2020 and will receive prizes and be featured in our 2021 Water Conservation calendar.

• Follow Up: Notice of Violation: Burgo noted that the BWS did receive a Notice of Violation from the Department of Health (DOH) and stated that she cannot comment on an open investigation.

Questions and comments followed:
1. Notice of Violation: Beekman asked about the nature of the pollution and settlement in the waterway. Burgo will report back.
2. Rain Collection Barrels: Imamura-Uruu asked and Burgo noted that BWS offers rain collection barrel workshops and information on their website (https://www.boardofwatersupply.com/meets_events/workshops/rain-barrel-water-catchment-3). Imamura-Uruu asked and Burgo noted that they can receive a rain collection barrel at the workshop.

Wood exited the meeting at 7:12 p.m.; 11 members present.

Honolulu Rail Transit Project (HRT): Pat Lee of the Honolulu Authority for Rapid Transportation (HART), Jason Tagos (Nan Inc.) and Danny Rosario (Road and Highway Builders (RHB)) reported the following:

• Rail Update: The full 20-mile, 21 station rail system is over 53% complete. Most of this is on the west side. The Maintenance and Storage Facility in Waiapu is 100% completed. The Rail stations in your area, Waiau (Pearl Highlands) is 94% complete, Kaloalu (Pearlridge) is 91% complete and Halawa (Aloha Stadium) is 85% complete. Kamehameha Highway resurfacing is 90% completed. HART and the City are working together to prepare for an initial opening of passenger service of the Honolulu rail system prior to launching full service. Train and system testing continues, and HART is working with Department of Transportation Services (DTS) and the State Department of Transportation on the safety certification and service reliability requirements in preparation for passenger service. HART’s job is to design, build, test, and certify the rail system to get it ready for revenue passenger service. HART staff is preparing for operational readiness in system integration testing, pre-revenue operations, management capacity and capability, and safety certification, all to get the trains, stations and facilities “ready to ride.” The City’s DTS will be in charge of operating and maintaining the rail system along with the bus and the handivan. A smart card swiping system, the HOLO card will be utilized and needed to ride the train. No cash ticketing will be available so everyone will need a HOLO card to ride. Riders would get to the stations by bus or Handivan connections, walking, riding a bike, taxi or ride share, being dropped off at the stations, or utilizing one of the planned park and ride lots along the route. There will be four (4) new bus transit centers at the Koahele station (UH West Oahu), the Ho’o‘ae station (West Loch), Waiau station (Pearl Highlands), and Halawa station (Aloha Stadium).

• Poster Contest: The annual HART Poster Contest is underway, and it is open to all Oahu high school students in 9th to 12th grades attending public, charter, private or home school. Posters are due on Friday, March 13, 2020.

• NAN Update: The bus stop replacement activity by HomeWorld/Pearlridge (eastbound, Kamehameha Highway) is done.

- The canopy arms were raised to the platform level at Pearridge Station last week. There will be a new overhead highway sign structure installation activity by Aloha Stadium Station, possibly in mid or late February 2020.

• Road and Highway Builders (RHB) reports that Kamehameha Highway resurfacing work includes: one intersection islands by Kaohoki Street West Bound, which should be completed by end of the month.

Oahu’s Neighborhood Board system – Established 1973
2. Traffic signal power and street light meter work is contingent upon Hawaiian Electric Company’s (HECO) schedule. Traffic signal and street light work is ongoing at the Kaohele intersection. Permanent stripping and raising manholes and fencing installation at the median is also taking place.

Schimmick Taylor Granite (STG); STG reports that the left turn at Halawa Drive and Arizona Street will be closed weeknights from 8:00 p.m. to 5:00 a.m. and weekends as needed from Tuesday, February 18, 2020 through Monday, February 24, 2020. Kamemehaha Highway between Kalolua Street and Kohumua Street will be closed overnight from 8:00 p.m. to 5:00 a.m. from Monday, February 24, 2020 through Friday, February 28, 2020. Also, STG will hold their business and community meeting on Tuesday, February 18, 10:30 a.m. to 11:30 a.m. at the Hawaii Employers Council building, 2862 Wai'alei Loop.

Contact Information: For more information, please visit the HART website at www.honolulutransit.org, you can call the project hotline at 566-2299 or email a question to info@honolulutransit.org.

Questions and comments followed: System Jurisdiction: Dwyer asked whom would have jurisdiction over the completed and interim services. Lee noted the system in place to transfer management of the system to DTS. Dwyer asked and Lee noted that the system should be ready for transfer by October 2020.

ELECTED OFFICIALS

Congressional Representative Ed Case: Nestor Garcia was present; the following report was given:

- Congressional Hearing: Garcia reported that there will be a Congressional hearing on Friday, February 21, 2020 at Bishop Mauieau. Garcia noted that the hearing will be focused on the Federal Fishing Laws that could greatly affect the Western Pacific. The hearing will begin at 10:00 a.m. and end at 12:00 p.m.
- National Oceanic and Atmospheric Administration (NOAA): Garcia reported that the Hi'talakai will be decommissioned after 25 years of service and noted that NOAA will be having a new vessel homeported out of Hawaii by 2023.
- Talk Stories: Garcia reported that Representative Case will be hosting additional Talk Stories within District 1 and stated that he will report the meeting locations in the future.

Arakawa entered the meeting at 7:23 p.m.; 12 members present.

Questions and comments followed: Land Swap: Vice Chair Sugimura asked about a potential land swap for a new prison and noted House Bill (HB) 2392 will be heard on Tuesday, February 11, 2020 in the House Judiciary Committee. Garcia noted their attempts to garner the Federal detention center in the future if they can receive an exemption from Federal statute.

Governor David Ige’s Representative: No representative was present; no report was given.

Mayor Kirk Caldwell’s Representative: Department of Information Technology (DIT) Deputy Director Keith Ho was present, the following report was given:

- Off-Street Parking and Loading Regulations: After a year’s worth of outreach and research, the Department of Planning and Permitting (DPP) has forwarded an amendment to the off-street parking and loading regulations to the City Council. The current regulations were largely adopted over 30 years ago, and since then the City’s vision has changed substantially to reflect a better understanding of traffic generation, the environment, affordable housing, and the market for multi-modal development. The proposed amendments align with the vision contained in the Oahu General Plan and Oahu’s Resilience Strategy. The Staff Report, Draft Bill, and Technical Memorandums can be found on the City’s website.
- Pamo Ho Place: HPD reported that District 3 officers made checks on Pamo Ho Place on Tuesday, February 4, 2020 to Thursday, February 6, 2020 and issued five (5) citations for illegally parked vehicles. Officers will continue to monitor the area and take the appropriate enforcement action. The DTS reported that low away zones are generally established along high volume, major thoroughfares, where it is necessary to keep travel lanes open to facilitate vehicular traffic flow, which is not the case on Pamo Ho Place. As such, the existing no parking signs will be retained. Refer illegal parking to HPD.
- Aiea Interim Field: The Department of Parks and Recreation (DPR) reported that it’s been determined the irrigation control panel is functioning properly. There are a few leaky valves and sprinkler heads. A request has been submitted to Maintenance Support Services for repairs to be made as soon as possible.
District 7 Councilmember Joey Manahan: Radiant Cordeno was present; the following report was given:

- **Fiscal Year 2021 Budget:** Cordeno noted that the City Council will be receiving the Fiscal Year 2021 Budget on Monday, March 2, 2020 and stated that they will be notifying the community of the Budget Hearings.

District 8 Councilmember Brandon Elefante: Councilmember Elefante was present; the following report was given:

- **Oahu Metropolitan Planning Organization (OMPO) Chair:** Councilmember Elefante noted that his time as OMPO Chair has ended. Councilmember Elefante noted that he is now Vice Chair and stated that Senator Harimoto will be the Chair for OMPO.
- **Friendship City:** Councilmember Elefante noted that the City and County of Honolulu has become a Friendship City with Okinawa.
- **Follow Up:** Councilmember Elefante noted that the Waimalu arson case is still being investigated.
- **HB 1853:** Councilmember Elefante noted that he is attempting to draft a bill that would fine trustees in order to end homeowner action on foreclosed or abandoned homes.
- **Resolution 19-136 Council Draft (CD) 1:** Councilmember Elefante thanked Arakawa. Councilmember Elefante detailed his draft amendments and noted the potential effects on the community.

Questions and comments followed:

1. **Storm Water Utility:** Dwyer noted that the Storm Water Utility should not occur and stated that the community should comment on the utility.
2. **Budget Projections:** Beekman asked about a budget projection for moving OCCO to Halawa compared to the facility remaining in Kalihī. Councilmember Elefante noted that DAGS could better answer the question.

ATTENDANCE AT OTHER MEETINGS:

- **HB 2459 Public Hearing:** Beekman noted her attendance at the HB 2459 rally and public hearing. Beekman noted that the bill was in regards to conscientious objections to vaccines. Beekman noted that the bill passed and noted her interest in the topic due to personal health concerns. Beekman stated that the Pearl City Neighborhood Board No. 21 passed a resolution in regards to the bill.

COMMUNITY CONCERNS:

- **ALEA Bridge:** Acosta updated the community on ALEA Bridge process for building a tenant passed rental program. Acosta asked that the community call 379-2532 or email info@aleabridge.org for more details. Acosta noted that the bill was in regards to conscientious objections to vaccines. Beekman noted that the bill passed and noted her interest in the topic due to personal health concerns. Beekman stated that the Pearl City Neighborhood Board No. 21 passed a resolution in regards to the bill.

APPROVAL OF REGULAR MEETING MINUTES: Hearing no objections, the December 2019 Meeting Minutes were APPROVED AS WRITTEN by UNANIMOUS CONSENT, (13-0-0). (Aye: Clark, Sugimura, Arakaki, Wood, Fitch, Beekman, Whitfield, Dwyer, Mizusawa, Moriwaki, Tsuj, Imamura-Urui, and Arakawa; Nay: None; Abstain: None.)

Discussion followed: Minute Inaccuracies: Arakawa noted a discussion in regards to a conversation draft written by Councilmember Fukunaga at the January 2020 meeting and asked that the minutes reflect this. Arakawa noted additional changes to be made to the January 2020 Meeting minutes and stated that it should read, "Arakawa noted that some would argue that the PRU should not be approved until after the project is funded." Beekman noted her concerns with inaccurate meeting minutes being posted online. Chair Clark detailed the process for submitting minutes. Beekman stated that the minutes are inaccurate and asked that more accurate minutes are written. Arakawa noted the process for submitting minutes and detailed the process for amending meeting minutes. Beekman noted that this process is misleading for the community. Tamamoto noted the amendment process for Board Meeting Minutes. Chair Clark noted that the January 2020 Meeting Minutes Approval could be deferred until March 2020 in order for Beekman to make her corrections.
Meeting Demographic: Tamamoto asked for the demographic of the NASED meeting and Kiminaka stated that there were both business and community stakeholders present.

Wood exited the meeting at 8:59 p.m.; 12 members present.

Briefing of the House Concurrent Resolution 85 Task Force (December 2018) on prison reform – B. Merce, Vice-Chair of that Task force, was present; the following report was given:

Wood entered the meeting at 9:03 p.m.; 13 members present.

- Task Force Update: Merce noted the improper process followed for funding the new jail location. Merce stated that the project lacked community input, is using failed jailing techniques, spends 204 thousand dollars daily on short term or pre-trial inmates, fails to deal with the underlying community issues, 50 percent of the jail’s population is for non-violent crimes, and greatly affect the poor, homeless individuals. Merce noted the need to get these individuals proper care in order to get them out of the judicial system and back into the community. Merce noted that we should not attempt to purchase the Federal jail or OCCC locations until after a community conversation is held.
- Contact Information: Please contact 732-7430 for more information.

Chair Clark handed the gavel to Vice Chair Sugimura at 9:08 p.m.

Questions and comments followed:

1. Reason for Incarceration: Beekman asked what changes inmates are jailed for and Merce noted that 80 percent of the inmates are incarcerated for a Class-C felony or less. Beekman asked if current social programs are ineffective and Merce noted that these issues occur due to a lack of focused social programs. Merce noted the poor state of care for inmates with mental health concerns. Chair Clark noted that some inmates that committed Class-C felonies or less have still committed dangerous crimes. Chair Clark noted that programs for these inmates may assist with recurring issues. Chair Clark noted the need to invite these people back into the community after they have reconciled for their crimes.

Dwyer exited the meeting at 9:10 p.m.; 12 members present.

2. Cash Bail System: Chair Clark noted attempts to lower bail and stated attempts in New York for a no-bail system.

3. Commission: Arakawa detailed Merce’s report and noted the creation of an Implementation Commission for the prison. Merce noted the attempts to have an oversight commission for the prison in order to create a rehabilitation prison.

Dwyer entered the meeting at 9:14 p.m.; 13 members present.

Vice Chair Sugimura handed the gavel to Chair Clark at 9:14 p.m.

Proposed Aiea Community Association (ACA) Christmas Parade and Fun Fair for December 2020 for approval – C. Tamamoto was present; the following presentation was given:

- Parade Details: Tamamoto noted that the ACA Christmas Parade will be held on Saturday, December 12, 2020.

Vice Chair Sugimura MOVED and Arakawa SECONDED the MOTION to SUPPORT the Aiea Community Association Christmas Parade and Fun Fair in December 2020. Hearing no objections, the MOTION PASSED by UNANIMOUS CONSENT, (13-0-0). (Aye: Clark, Sugimura, Arakaki, Wood, Fitch, Beekman, Whiflet, Dwyer, Mizusawa, Moriwaki, Tsuji, Imanura-Ulu, and Arakawa; Nay: None; Abstain: None.)

Aiea Bus routes serving the rail stations during interim opening late next year – S. Abelaye-Department of Transportation Services (DTS). S. Abelaye was present; the following report was given:

- Route Changes: Abelaye noted that there will be few changes made to the existing bus routes during interim service and stated that the bus routes will be changed to have a stop near a rail station. Abelaye noted that there will be a new rail station created that will travel from Aiea Station to Ala Moana. Abelaye noted that she will be disseminating a handout about future changes made to the system and reported that there will be a transit station implemented in the region.
Questions and comments followed: Bus Routes: Vice Chair Sugimura asked about circulatory bus routes for the rail system and detailed the region’s lack of park and ride facilities. Abeleya noted that the existing bus routes will be redirected towards a regional rail station. Vice Chair Sugimura asked and Abeleya noted that they have not determined the route time for the region. Abeleya noted that they will need to know the level of service before they can make changes to the routes. Abeleya noted that the DTS will make changes to the bus routes once full rail service is completed. Vice Chair Sugimura noted that many riders will be using park and ride facilities and asked how often the regional buses will come through the region. Abeleya noted that DTS will know how often the bus will travel through the region once they determine the level of ridership. Dwyer asked about Route 71 having too few buses throughout the day and Abeleya noted that this was due to poor ridership. Tamamato noted that the bus routes that are meant to take residents to either rail stations or Ala Moana. Beekman asked about the potential elimination of Route 54 and Abeleya noted that this route will still be utilized.

Draft Environmental Impact Statement (EIS) for the Honolulu/Waipahu/Pearl City Wastewater Conveyance Facilities – R. Loui, AECOM, was present; the following report was given:
- **Project Details:** Loui announced that the programmatic Draft EIS for the Wastewater Conveyance Facilities can be found online ([https://www.libraryhawaii.org/wp-content/uploads/2020/01/Public_Review_2019-2020.pdf](https://www.libraryhawaii.org/wp-content/uploads/2020/01/Public_Review_2019-2020.pdf)) or at their public library. Loui noted that there is a public commenting period that ends on Monday, February 24, 2020.

Questions and comments followed: **Project Details:** Wood thanked Loui for their 30 year timeline for the project. Arabakawa asked how long the entire project would last and Loui noted that the project would take 30 years. Arabakawa asked how fast the project will proceed. Loui noted that the project will stretch towards Halawa and work its way back towards Sand Island.

TREASURER’S REPORT: Fitch reported an expenditure of $30.75 in December 2019 and $31.44 in January 2020. Fitch reported that there’s a remaining balance of $232.27.

COMMITTEE REPORTS:
- **Anea Community Association (ACA):** Tamamato noted that there will be an ACA meeting held on Monday, February 17, 2020 at the Anea Public Library. Tamamato noted that the meeting will begin at 7:30 a.m.
- **Executive Committee:** Chair Clark noted that there will be a public hearing on Thursday, February 27, 2020 for Teddy’s Bigger Burger and their desire to sell alcohol.
- **Red Hill Fuel Tanks:** Beekman noted that she attends most of the Red Hill Fuel Tanks public meetings and stated community conviction against the Red Hill Fuel Tanks. Beekman noted that there is a lack of documents with evidence pertaining to the leaks at Red Hill and stated that the Navy has not reported any leaks since the 1990s. Beekman noted that many of these documents are meant to explain the process for determining whether there is a leak and stated the importance of seeing the system in person. Beekman noted the importance of garnering community comment on the project and stated that the military leaving would be detrimental to the Hawai’i economy.

ANNOUNCEMENT: Chair Clark announced that the Anea Neighborhood Board No. 20 will be having their next regular meeting on Monday, March 9, 2020 at the Anea Public Library at 7:00 p.m.

ADJOURNMENT: Hearing no objections, Chair Clark adjourned the meeting at 9:39 p.m.

Submitted By: Chris Naylor, Public Relations Assistant
Reviewed By: Jackson Coley, Public Relations Assistant
Reviewed and Finalized By:
email address. Once you are logged in, you can: Access your water consumption data as it becomes available for each billing period, see how your water use compares to similar household sizes in your neighborhood, have access to customized recommendations on how you can save water and money and sign up for high usage and/or leak alerts.

Hilitchi Rail Transit Project (HART): Pat Lee of the Honolulu Authority for Rapid Transportation (HART) and Danny Rosario (Road and Highway Builders (RHB) reported the following:

HART March 2020 Report: The Honolulu rail system will operate the trains from 4:00 a.m. to Midnight each day. After the day’s run, trains go back to the Rail Operations Center (ROC) in Waipahu next to Leeward Community College (LCC) and Waipahu High School (WHS) for cleaning and servicing. The 43-acre Rail Operations Center and Maintenance and Storage facility is 100% completed and includes four major structures: The Operations Building containing building which contains the operations control center and the trains via a computer system, a vehicle maintenance section and inspection and repair facilities. The Maintenance of Way building contains specialized equipment that is used to inspect and repair the guideway, stations and tracks. The Train Wash facility cleans the exterior of the train vehicles. The Wheel Truing building houses specialized equipment to maintain the steel wheels of the trains. Hilitchi Rail Honolulu (HRR), the contractor that will operate the Core System which includes the ROC and MSF as well as the train vehicles, plans to hire about 200 people for their operations. HART has partnered with LCC which offers an Integrated Technology program to prepare students for future work in rail operations as part of the LCC workforce development program. Akea area projects include the Kamehameha Highway group is 91% completed, the Waiawa station is 96% completed, the Kailua station near Pearl Ridge Shopping Center is 93% completed and Wai’anae station near the Aiea High School is 87% completed.

Poster Contest: The annual HART Poster Contest is underway, and it is open to all Oahu high school students in 10th to 12th grades attending public, charter, private, or home school. Posters are due on Friday, March 13, 2020. Rate Commission Meeting: The next public meeting of the Rate Commission will be on Tuesday, March 10, 2020 at the Mission Memorial Auditorium from 6:30 p.m. to 8:30 p.m.

Road & Highway Builders (RHB): Danny Rosario reported RHB is working on repaving a third lane on Kamehameha Highway at Kaohokulani Street due to erosion, and wearing away. Once complete, it will allow cars to move better and safer.

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Falen Tree: There is a fallen tree across the drain from 2939 Maalmoa Drive. DFM: If this is Kolomoa Drive it’s tree branch fell across in the road.

Governor David Ige’s Representative – DBEDT Deputy Director Chung Chang reported:

- Corona Virus Update: Deputy Chang provided flyers and gave an update regarding the coronavirus in Hawaii. Deputy Chang noted that anyone can get the most recent information by visiting the Hawaii Department of Health (DOH) website.

- Census: Deputy Chang noted that DBEDT is helping with the 2020 Census and he has brought flyers and tote bags for the community.

Questions and comments followed: Preschool Concerns: Resident Claire Tamamoto noted that she runs a preschool which already teaches hand washing and other measures but asked if someone visits a “level 2” country such as Japan, will they need to go into quarantine. Deputy Chang noted that anyone who travels to a level two (2) or three (3) country will have to self-quarantine for 14 days. Deputy Chang noted that anyone can call 211 for more information.

Mayor Kirk Caldwell’s Representative – OIT Deputy Director Keith Ho reported:

- Census Day: Deputy Ho noted that Wednesday, April 1, 2020 has been declared “Census Day” and everyone will receive an information in the mail soon to participate in 2020 census.

- Concerning the installation of LED lights in Ala Moana Park, http://www.honolulu.gov/cnts-pd-sd-menusite/led-lighting/led-lighting-ali-moana-regional.html: The article states that “This project will upgrade approximately 570 of the existing light and “The Project will cost $1.2 Million”.

Road & Highway Builders (RHB): Danny Rosario reported RHB is working on repaving a third lane on Kamehameha Highway at Kaohokulani Street due to erosion, and wearing away. Once complete, it will allow cars to move better and safer.

Poster Contest: The annual HART Poster Contest is underway, and it is open to all Oahu high school students in 10th to 12th grades attending public, charter, private, or home school. Posters are due on Friday, March 13, 2020. Rate Commission Meeting: The next public meeting of the Rate Commission will be on Tuesday, March 10, 2020 at the Mission Memorial Auditorium from 6:30 p.m. to 8:30 p.m.

Questions and comments followed:

1. Hour: A board member asked the hours of operation for the rail. Lee noted that rail will operate from 4:00 a.m. to midnight every day.

2. Pillow Concerns: A board member noted his concerns about the accidents involving vehicles hitting rail pillars. Lee noted that there were any plans to add any safety measures onto the rail. Lee noted that he does not know of any plans to do so.

3. Volunteers: Board member Beekman asked if the HART Board members are volunteers. Lee noted that the board members are volunteers and the only members who get paid are Department heads for the Department of Transportation Services (DTS), Hawaii Department of Transportation (HDDT) and Department of Planning and Permitting (DPP) as part of their job.

4. Main Location: Beekman asked if the LCC station will be HART’s main station. Lee noted that LCC location will be the maintenance and storage yard.

5. State’s: Board member Beekman asked what kind of rates to ride the rail is being discussed. Lee noted that they have a rate commission that will determine the rates.

Filling of Vacancy in Sub-district two (2): Chair Clark asked if anyone was interested in filling this vacancy. There was no volunteer from the audience.

ELECTED OFFICIALS

Congressional Representative Ed Case - Nester Garcia was not present. No report.
Senator Breene Harimoto - Senator Harimoto’s representative distributed his report.

Representative Aaron Ligtin Johnson - Representative Johnson reported:
- Coronavirus Need to Know: Coronavirus is a respiratory illness that can spread from person to person, the symptoms include fever, cough, and shortness of breath. Symptoms may appear two (2) to 14 days after exposure. Preventative measures include avoiding close contact with the sick, washing your hands with soap and water for at least 20 seconds, clean and disinfect frequently touched surfaces and stay home when you are sick except to go to the doctor’s office.
- Senate Special Committee on Covid-19: This was formed like a committee formed after the September 11, 2001 attack on America. This committee will look at the long-term effects that this virus will have on the health, economy, and other sectors of Hawaii.
- House Bill (HBI 2217): This bill aims to increase resident involvement in the Stadium Authority decision making process by adding a resident of Asia or Halawa to the Stadium Authority Board. This bill has passed through the House and has been heard in the Senate’s Energy, Economic Development and Tourism (EET) committee.

Questions and comments followed: How Chosen: Board member Wood asked how this person would be chosen. Representative Johnson noted that someone needs to apply, and it is an appointed position by the Governor and the person would need to be confirmed by the Senate.

Representative Ronny Cachola - Representative Cachola reported:
- Corona Virus Impact: There is much concern about the Corona Virus and the potential to affect tourism in Hawaii. Hawaii needs to address this issue with the creation of a special fund that will assist business that rely heavily on tourist revenue. The latest report confirms a $1.17 billion shortage increase.
- HB1462 HDI: This bill has been carried over from last session which relates to Unfunded Liabilities and is currently pending in the Senate. The money could help fund budget shortfalls.
- HB 1977 Physician Shortage: This bill addresses the State’s physician shortage by establishing a Medical Student Sponsorship with the Department of Health (DOH) for residents of Hawaii.
- Haapai Stream and Makalapa Park Damage:
  - Haapai Stream Erosion: The City/County Department of Design and Construction (DDC) is waiting for a response from the Army Corps of Engineers (ACE) as to when they will approve a staging area and an estimated completion date for each stage of the project. Once approval is received the DDC anticipates that it may take at least two (2) years to prepare construction plans and specifications to obtain permits and clearances from other agencies.
  - Makalapa Park Damage: There is no updates from the City on this matter after my office reported that water coming from Makalapa Park caused the collapse of the drainage system and the area homeowners should not have to pay for the repairs.

Representative Sam Kong - Representative Kong reported:
- Storm Water Utility Briefing: Representative Kong noted the City and County of Honolulu held a briefing in Asia tonight and he found it highly informative. Representative Kong recommended everyone attend the meeting the next time it is held in the area.
- Town Hall with Governor David Ige: Please join Governor David Ige and other area legislators at the next Town Hall meeting at Pearlridge Elementary School cafeteria on Wednesday, March 11, 2020 from 7:00 p.m. to 8:30 p.m.

District 6 Councilmember Carol Fukunaga – Chair Clark noted that Councilmember Fukunaga and her staff was note able to attend tonight’s meeting due to attending another meeting regarding the Coronavirus, but her newsletter was distributed. Chair Clark highlighted:
- Bill 66: This bill relates to the DPP management of monster homes.
- Monster Home in Halawa: Councilmember Fukunaga is still working on a monster home in Halawa that looks like a small apartment building.
- Federal Detention Center (FDC): There is a bill that is considering acquiring the FDC.

District 7 Councilmember Joey Manahan - Divina Schwering reported:
- Bill 35: On March 6th, 2020, Councilmember Joey Manahan and Chair Ikala Anderson co-introduced Bill 35 (2020), a bill for an ordinance relating to funds. The purpose of this ordinance is to amend the provisions pertaining to the Reserve for Fiscal Stability Fund. The reserve for fiscal stability fund is designated for economic and revenue downturns and emergency situations, and fund monies be appropriated by ordinance only when one or more of the conditions of Economic Triggers. Revenue Triggers, and Emergencies are met. Specifically, this ordinance will include the Fiscal Stability Fund to be used during an occurrence or imminent threat thereof, which results or may likely result in significant injury or harm to the population in the City and County of Honolulu. In response to COVID 19, the passage of this ordinance will allow for the Fiscal Stability Fund to include epidemiology, which deals with the incidence, distribution, and possible control of diseases and other factors relating to health. Bill 35 is going to be heard on first reading during the March Council meeting.
- Budget: Councilmember Manahan is the Budget Committee Chair and is looking for suggestions for funding city projects, if you have a suggestion please contact their office. The Fiscal Year 2021 budget submitted by Mayor Kirk Caldwell is $2.96 Billion and the Capital Improvement Budget is $1.27 Billion.

Questions and comments followed: Makalapa Park Funds: Board member Wood asked for an update of the funds that were promised by Councilmember Manahan at a previous town hall meeting to repair the fence and do other improvements to the Park. Schwering noted that project is part of the amendments to the budget will be submitted soon and she will report back at the next board meeting.

District 8 Councilmember Brandon Elefante – April Coloretti reported:
- Real Property Tax Legislation: Councilmember Elefante introduced three (3) bills that were recommended by current and past Real Property Tax Commissions. Bill 11 would repeal the real property tax (RPT) exemption for credit unions, this bill was postponed in the budget committee. Bill 12 would increase the RPT for historic homes, this bill will be heard at the Wednesday, March 18, 2020 Full Council Meeting. Bill 16 would increase the minimum RPT for for-profit childcare facilities, this bill will also be on the Full Council Agenda.
- New Kiосk: The Department of Motor Vehicles (DMV) has just installed a kiosk in the Waipio Foodland where residents can renew their vehicle registrations with their debit or credit cards. The kiosks are also available at select Safeway Stores.
- Interest-free Home Down Payment Loans: The Department of Community Services (DCS) wants you to know that qualified low or moderate-income families may be eligible for the interest free down payment loans to assist in their home purchases. For more information, please call the DCS loan branch at 768-7076. The loan brochure is available at: http://www.honolulu.gov/prop/img/side/docs/Apr12015DownPayment.pdf

Questions and comments followed: Increase: Board member Beekman noted her concern with the large increase of the tax rate from $300.00 yearly to $1,000.00 yearly. Coloretti explained that the $300 is the minimum property owner could pay but this bill pertains to certain owners such as credit unions, historic homes owners whose homes may be worth millions of dollars and a few others. Coloretti noted that there are a lot of exemptions and she will email Board member Beekman further information.

BOARD MEMBER ATTENDANCE AT OTHER MEETINGS: Board member Beekman noted that she attended the second committee meeting of HB 2459 regarding the conscientious objections to vaccines. This bill was to be heard by several house committees and was originally planned to take effect in 2020 but the bill died in committee. Board member Beekman also noted that she attended a meeting at the Church of the Crossroads regarding a toxic chemical in Oahu’s drinking water.

COMMITTEE CONCERNS: There were none.

APPROVAL OF REGULAR MEETING MINUTES OF MONDAY JANUARY 13, 2020: Mizusawa moved and Wood seconded the motion to approve the Monday, January 13, 2020 minutes as presented. The motion passed by a vote of 9-1-0. (Aye: Clark, Sugimura, Arakaki, Wood, Whitfield, Mizusawa, Moriwaki, Fatelah, and Tsujii; Nay: Beekman; Abstain: None.)

APPROVAL OF REGULAR MEETING MINUTES OF MONDAY FEBRUARY 10, 2020: Sugimura moved, and Whitfield seconded the motion to approve the Monday, February 10, 2020 as presented. The motion failed to pass by a vote of 5-4-1. (Aye: Clark, Sugimura, Tsujii, Arakaki, Mizusawa, Nay: Wood, Moriwaki, Beekman, and Whitfield; Abstain: Fatelah.)
everything that was said and requested that her corrections be simplified. Board member Beeckman noted that she will send the Neighborhood Assistant (NA) a copy of her corrections. Board member Wood asked if a Board member has many corrections to the minutes, can they bring a copy for the other board members to read so it does not take a long time to approve the minutes. Board member Beeckman asked if all Board members could receive the draft minutes prior to posting the final on the website so they all could make their own corrections. Board member Wood noted his concern that it could violate Sunshine Laws. Neighborhood Commissioner Clare Tamamoto suggested that this issue be brought up to the Commission for clarity but also noted that it is the Chair’s prerogative to have the minutes presented as he prefers. Board member Sugimura noted that there is a note taken for the minutes and noted that Robert’s Rules does not allow for discussions and opinions like the Neighborhood Commission does but likes the suggestion to send this concern to the Commission. Chair Clark asked that this issue be brought to the Commission.

BOARD BUSINESS

Update of Resolution 19-136: Approving an Application for a Plan Review Use (PRU) Permit for the Relocation of Daly Correctional Center to Halfway: Rettilia Mehrtort gave an update of the project. Mehren wants to thank the City Council for the approval of the PRU on Wednesday, February 19, 2020 and believes this is a win-win for everyone involved. Mehren noted an adjustment to the Resolution that requires the Department of Accounting and General Services (DAGS) as well as Public Safety Department (PBD) to include in their written annual report to the Area Neighborhood Board No. 20 and the area Council/member an update of the feasibility of providing treatment to the homeless and mentally ill. Mehren noted that concern has been brought up many times by the public and it is “spectacular” that this language is now included in the Resolution.

Questions and comments followed:
1. Significance: Board member Beeckman asked what the significance of the PRU is and how does it help this project go further. Beeckman also asked if the Board will be asked for comments as the project goes forward. Mehren noted the PRU is a zoning document which typically states what type of structure that can be built on a lot and getting zoning for a jail is very unique. Mehren also noted that it is not a done deal and there are many other things that need to happen before the jail actually gets built and the Board will definitely be in the conversation as the project goes forward.
2. Why Location: Board member Beeckman noted a report that she read saying the size of the new facility will only allow for 100 additional beds for the jail. Mehren noted that parts of the current facility are over 100 years old and there are many challenges with keeping the old facility open. A new facility is needed to provide the many services that are needed for the inmates to return to the community and Mehren noted that she is deeply passionate about this project. Chair Clark noted the services will help the inmates to become a contributing member of the community after their release.

Update of the Aloha Stadium Redevelopment Project: Josh Smead of Crawford Architects gave an update of the project and noted: Crawford Architects is expecting to be releasing the Request for Qualifications (RFQ) process in March 2020 which they will be asking for resumes from firms that want to submit a design proposal and the company will reduce the resumes down to a list of the top three (3) or four (4) respondents and contact the those firms for a Request for Proposal (RFP) where they will be submitting specific designs.

Questions and comments followed:
1. Significance: Board member Beeckman asked if the H-H-U be for the whole project or just a portion of the project. Smead noted that they are initially looking for proposals for “Phase 1” of the project which includes the Stadium and an ancillary development.
2. Timelines: Board member Wood noted that he asked for timeliness at the previous meeting. Smead noted they will be updating the website with the pertinent information, but the present timeline is the RFQ in March 2020, the RFP in mid-2020 and picking the design team by the end of 2020. The expected construction start for Phase 1 will be the first or second quarter of 2021 which sticks with the original timeline to coincide with the opening of the University of Manoa (UH) football team’s 2023 season. The rest will depend on market conditions, which is why the project is being phased. Smead noted that they are estimating the phases to have at least five (5) years in between.
3. Best value: Board member Beeckman asked if the company will be looking for low bids or will be considering the best value from bidders. Smead noted they will be looking for the best value for a quality product because it is a major investment for the State.

4. Website’s Timelines: Rettilia Tamamito asked if the website could show the timeline for the phases. Board member Sugimura asked if the website timelines will give a timeline of all the different phases for the project. Smead stated that the website will show the timeline for all phases of the project.
5. Ancillary Development: Board member Sugimura asked if there is a timeline for the ancillary development noting that businesses would be relying on the stadium to draw the customers. Smead stated that the new stadium is planned to be built then the ancillary development should be ready for bidders at the same time or a little bit after.
6. Why’s Playing: Board member Tsuya asked if there will be conditions to developers to provide their own demolition because he wants to know what the taxpayers are going to get for their money. Smead noted the State’s portion will be $350 million which could be used for several purposes such as design or demolition. The Stadium project is a P3 partnership and the State’s portion is $350 million the rest will come from private sources and the goal is to make the stadium self-supporting so the taxpayers would not be burdened. Income could come from different sources, not only ticket sales but also income from the ancillary development. Deals are continuing as far as what the $350 million will be used for specifically. Smead also noted that he is on the architectural side and has not been in the financial talks and could possibly bring someone to the future Board meeting to answer the question better. Smead also noted that there will be many conditions to interested bidders that will protect the State’s interest.

REPORTS:
- Treasurer’s Report: Chair Clark reported a remaining balance of $201.49
- Area Community Association (ACA): The next scheduled meeting is Monday, March 16, 2020 at 7:30 p.m. at the Aiea Public Library.
- Live, Work, Play Area: No report.

COMMITTEES:
- Executive Committee: No report.
- Transportation: No report.
- Community Relations and Publicity: No report.
- Parks and Recreation: No report.
- Planning and Zoning: No report.
- Restoration and Advisory Board: No report.
- Red Hill Fuel Tanks: Board member Beeckman submitted a written report as follows:

Rebuildable to BWS’s January 2020 report.

1. BWS: Data shows rusting occurring on the side of the tanks that cannot be really inspected or fixed. Rebuildable: Navy absolutely disagrees with that. It CAN be inspected & it CAN be fixed. Industry does this all the time. You just patch over the top of it. You just add more steel on the other side. You do not fix it from the outside wall. You just continue to reinforce the steel on the inside wall that you can access.

2. BWS: We have seen lots of data that show information that these tanks have leaked in the past. There are reports that show, or talk about, small levels of leaks that are beyond the ability to measure. Rebuildable: That is factually inaccurate. Navy says has never seen any reports of leaks that are beyond the ability of the Navy to measure. Could not fathom how would there be reports of this if the Navy was unable to measure.

3. BWS: The contractor error occurred on work to repair through-wall holes and test the condition of the liner’s integrity. Through-wall holes are caused by corrosion that is occurring on the backside of the tank that the Navy cannot see or fix. Rebuildable: Absolutely false. Navy says workers gas tests holes that are drilled through the steel & that are required to be filled back in. Those are not through-holes that have developed due to corrosion. There has been corrosion and the Navy is going to address it, but in no way does that corrosion create through holes. The 2014 27,000-gallon leak was improper procedure of the contractor of the maintenance company that drilled the holes through. Workers need to drill the holes (gas tests holes) through the tank whenever they weld to be sure there are not explosive gases behind the tank that could be set off by the heat of welding.

4. BWS: As the fuel stored at Red Hill is mostly jet fuel, it has limited use for civilian fuel needs during a disaster. For example, our generators do not run on jet fuel, they run on diesel. Rebuildable: Navy does not want to tell the Board of Water Supply what they could or could not burn in their generators, however the Navy does store diesel fuel at Red Hill, which is what BWS says they use. Navy was thinking mostly of Hawaiian Electric rather than BWS. In the case of a natural
disaster or emergency, The Navy has been told the Hawaiian Electric generators can run on the Red Hill fuel, as many other types' generators run on that fuel. 1) There is diesel fuel stored up at Red Hill, 2) In the case of a natural disaster or emergency, Hawaiian Electric has said that they are able to burn the fuel inside of Red Hill to power their generators.

March 9, 2020 Report

- Corporate & BWS: After I said a year or so ago in testimony that the Red Hill tanks are protected by several feet of concrete, the BWS said concrete is porous, cracks and leaks in several of their presentations. That is why I brought up the Hoover Dam and its concrete at the January 2020 meeting. Although the Hoover Dam concrete was painstakingly designed and mixed not to crack or leak, and they never have, it does not necessarily follow that the Red Hill tank concrete has not cracked or leaked. However, it is logical that the construction companies involved in both the Hoover Dam and Red Hill projects knew how to test and pour quality concrete to suit the purpose for which the tanks were built. The American Society of Civil Engineers (ASCE) says on their Red Hill website page that the Red Hill tanks were painstakingly tested for leaks when they were built.
- Joint Base Pearl Harbor Hickam (JBPHH): I do not expect JBPHH to close because I do not expect the Navy to move all their fuel off island if the Navy decides from public pressure that the Red Hill fuel tank fuel needs to be moved elsewhere, it does not necessarily mean the move will be to another location on Oahu. It could be elsewhere, such as the mainland. That would mean downsizing and relocation of jobs to where the fuel, ships and planes have been moved, but I have never suggested that JBPHH would be closed because of the fuel move.

ANNOUNCEMENT: Chair Clark announced that the Aiea Neighborhood Board No. 20 will be holding their next regular meeting on Monday, April 13, 2020 at the Aiea Public Library at 7:00 p.m.

ADJOURNMENT: Hearing no objections, Chair Clark adjourned the meeting at 9:02 p.m.

Submitted By: Naomi Hanohano, Neighborhood Assistant
Reviewed By: Christopher Naylor, Public Relations Assistant
Reviewed and Finalized By: Bill Clark – Chairperson, Aiea Neighborhood Board No. 20

‘Aiea Community Association
September 16, 2019
‘Aiea Library Program Room, 7:36pm


II. Secretary’s Report: Minutes for the August meeting accepted.

III. Treasurer’s Report: No Treasurer’s Report. We need another Treasurer

VII. New Aloha Stadium Entertainment District (NASED) Out of Order for presentation. The State along with consultants did a short presentation to the community explaining what is being proposed for the Aloha Stadium development. A meeting will be held at the Hospitality Room of the Aloha Stadium on September 25, 2019. The State under DAGS with consultants Wilson Okamoto is currently soliciting comments for the EIS pre-consultation notification.

Regarding this development, the ACA has requested that a representative from the NASED keep the ACA abreast of matters pertaining to the proposed development. The 3 proposed plans in the EISPN are flexible and the stadium is still able to operate as it goes through renovation. The area should continue to be an asset to the community and at this time, any and all comments regarding the development, the site and alternative uses for the site are welcomed.

The Stadium Authority will be partnering with the Honolulu Community Development Authority (HCDA) to develop the site. As we may recall, the HCDA developed Kaka’ako. The Stadium Board will guide policy for the development. HCDA is for zoning. Public Private Partnerships (P3) will be formed to develop the site. The Office of Planning will also be planning to connect the development to communities and for ancillary development. Currently looking for feedback on the initial proposed elements for the EISPN and no go’s.

Discussion regarding sea level as the field is 20 ft above sea level and there is a 6 ft rise predicted; a dome ceiling; traffic studies, and other matters took place. All comments are welcomed and will be reviewed at this stage.

IV. Mass Transit-There will be limited service to familiarize riders with the Rail. Volunteers may be needed to aid riders in a soft opening. The Airport station is proposed to open in 2023 and Ala Moana in 2025.

The canopies continue to be a challenge and is holding up matters. The Recovery Plan has been approved and includes the finance plan; funds are contingent on the award of the final leg of the project, the 4 miles from Middle St. to Ala Moana. The Park and Ride at Pearl Highlands will also be constructed in the final leg.
DTS is currently making improvements along the Rail corridor. Sidewalks are being widened, trees and landscaping are taking place at the Waipahu station and expected to take place for all stations upon completion. Other improvements road striping, street curbing, traffic lights will continue to Aloha Stadium to the end of the year.

12 train cars are on island. Hitachi to run the Rail with DTS as its client. No cash will be used for fares-all rides will be via the Holo card. Cards will be available in vending machines at the stations. The Rate Commission to decide fare rates. Next rate Commission meeting is September 17, at 2:30.

V. Loko Paaiau-Next work day is September 28 which is National Land Day. Appears a land grant was awarded. More details to follow.

VI. Gateway-still no water to the site. DOT looking into it. Kanani, Kehau’s daughter doing a graphic for the sign.

VIII. EAH Affordable Housing- Unclear if this is on the 9/26 City Zoning, Planning and Housing Committee agenda or the October 9th City Council agenda.

IX. OCCC Update and Plan Review Use Application- ACA sent in testimony saying that this approval is premature and the community has not been properly kept abreast of the OCCC plans. The Aiea Neighborhood Board wrote a similar letter.

X. Library Book Sale-Set for November 2. Volunteers needed for set up and take down.

XI. Membership-No report

XII. Aiea Neighborhood Board- Helicopter nuisance and the removal of a crosswalk was discussed along with the Stadium proposal.

XIII. Aiea Parade and Fun Fair-Permit has been submitted. Applications are available. We need a Chairperson and a Grand Marshall for the Parade. Ideas? Email to AieaParade.com

IXV. Misc: On July 31, the City Dept. of Consumer Affairs was made aware of the feral chicken problem. Nothing done yet.

XV. Info made available/Handouts: See Agenda Announcements; NASED FAQ’s; Plan Review Use; Kamehameha Hwy roadwork Notice; Honolulu Rate Commission Meetings; Senator Donna Mercado Kim; Capitol Connection, September 2019; and Neighbor to Neighbor by Carol Fukunaga, September 2019.

‘Aiea Library Program Room, 7:40pm

‘Aiea Community Association
October 21, 2019

I. Introductions/Attendance: Attendance sheet sent around: Julie Au, Scott Chan, Laurie Chang, Loren Chang, kennard Chong, David DePonte, Karen Higa, May Imamura-Uruu, Randi Jueng, Chris Kimmaka, Pat Lee, Aaron Ling-Johanson, Kimberly Mills, Susan Mortshige, Danny Rosario, Jane Sugimura, Wayne Suzuki, Tina Takamoto, Claire Tanamoto, Roelle Torres, Trisha Kehaulani Watson, Mark Yamanaka

II. Secretary's Report: Minutes for the September meeting accepted.

III. Treasurer's Report: We need a Treasurer. The 990 form has been filed; Expenses for insurance and Fun Fair covered. Funds from the Library Book Sale will be collected.

IV. Mass Transit-Danny Rosario from Roadway Builders gave the latest news regarding the RAIL project and effects on Kamehameha Hwy. Stay away from Ka'ano'i St where the new RAIL station is being constructed. Beginning mid-December, there will be no driving between columns; U turns will be at signalized intersections. Some column areas will be grassed and fenced.

There will be no construction November 28-December 1 and December 21-25th. Striping work will be done at night. For matters pertaining to this work along Kamehameha Hwy, individuals may call 285-2540 until 930pm. There will be temporary lane closures with detours both east and west bound from November -March for the pulling of utilities for the stations.

Use work along Dillingham, there is an accelerated construction effort of 18 months from Middle St. to Costa. Currently communication and other utilities lines are being located and moved. October 24, there will be a Town Meeting at Kapalama Elementary at 6pm. For the final 4.1 mile stretch from Middle St. to Ala Moana, 8 stations are proposed.

Regarding the Kaluaau station, it is currently 85% complete. Lisa Yoshihara and Kawika Farm from HART are working on interpretive displays of our natural and cultural assets for the station.

V. ‘Aiea Public Library-Tina Takamoto of the ‘Aiea Library reported acts of vandalism at the Library during off hours. The breezeway gates and windows were targeted. Lights, potential cameras and notifying the schools were proposed to deter these kinds of actions.

The Book Sale is November 2, at 10am-3pm. Need volunteers to set up the previous day and take down upon completion of the Book Sale.

VI. New Aloha Stadium Entertainment District (NASED) Trisha Watson and Julie Au of Honua Consulting will be conducting interviews to collect information about the area. Maps of prehistoric and historic sites were shared. Chris Kimmaka of DADS stated that the comment period had been extended to November 7 for the ISPN. Meetings have taken place with the vendors of swap meet. Swap Meet is seen as vital to the Stadium and will be available during and after construction. Over 100 representatives of architecture and engineering firms showed an interest in the NASED project.
Halawa neighborhood has generated complaints regarding events at the Stadium. Windows rattling and late night noise complaints. Regarding the nearby development by Kuratani, the project has reduced its density.

VII. OCCC Update and PRU Application-An extension to the application was submitted in January and the application was deferred by the City Council as more community outreach was needed. A talk story session is proposed. The project needs to respond to questions that were not addressed. Rep. Takayama is pushing for the Federal Detention Center. However, the Feds are not offering it for sale. Congressman Case is looking to see if Feds would sell it. However, Feds are not known to sell land; may need a trade-off.

Our community should direct and guide development and not let outsiders dictate to us.

VIII. Loko Pa’ia’iau-May need to conduct an event by November 30. A DoD legacy grant of $9.267 for National Public Lands Day was awarded. A hale for a Learning Center is proposed. Lots of children have been to the pond thru school and summer programs.

IX. ‘Aiea Parade and Fun Fair-Set for December 14, 2019. More participants are needed. Laurie has volunteered to be the Fair coordinator. Water access for the sink is needed. Meetings regarding the Parade and Fun Fair to take place.

X. ‘Aiea Gateway-Clean up took place October 12 with the Lions Club. The nearby ‘islands’ were also cleared of rocks and grass. Water was repaired but still leaks and the sign still needs to be addressed. Ken Chong to follow through regarding the renewal of the Adopt A Hwy for the next 2 years.

XI. ‘Aiea Recreational Baseball Field-Would like a MOA or MOU between the City and High School. Claire would like to coordinate to work with the ADs and Principal so that AHS would not lose the use of the field. On a historic note, the City actually developed schools in the past. Also, would like to know if the flag pole at the bleachers would be returned.

XII. ‘Aiea Affordable Senior Development -EAH- Passed through City Council; there was a Press Conference on site; There will be a 65-75 year lease for the property that will have 140 units.

XIII Feral Chicken and Abandon Cars-70 chickens were caught by exterminators contracted by the City.

XIV. Membership-No report

XV. Aiea Neighborhood Board- Recess in November.

XVI. Info made available/Handouts: See Agenda Announcements, NASED FAQs and Update; Kamehameh Hwy Roadwork Notice; Do You Know About REAL ID?; Raising a Peaceful Child November 2; Claire Tamamoto testimony for NASED; Capitol Connection, October 2019; and Council District 6 Report for October 2019 and Neighbor to Neighbor by Carol Fukunaga, October 2019.

‘Aiea Community Association
November 18, 2019

‘Aiea Library Program Room, 7:35 pm


II. Secretary's Report: No minutes presented.

III. Treasurer’s Report: We need a Treasurer. The Treasurer will be responsible for keeping track of the ACA Funds and Friends of the ‘Aiea Library Funds and disbursement. ACA funds collected include membership, donations, and book sales. Friends of the Library funds collected include collection of funds from the black can, membership, book sales, and donations. The 990 form has been filed; Expenses for insurance and Fun Fair covered. Funds from the Library Book Sale will be collected.

IV. Mass Transit: Pat Lee gave us an update on construction of the RAIL. The 3 western most stations are about 95% complete; the Farrington Hwy Group is about 82% complete and is being done by Hawaiian dredging; the Kam. Hwy group that includes the Kalua’au Station is about 85% complete with a completion date of December 2020. The paving of Kamehameha Hwy is about 84% complete; and the stretch to the Airport is about 57% complete. The 4.1 miles from Middle St. to Ala Moana will be on an accelerated schedule with the goal of completion within 2 years. Work is scheduled day and night for 10-hour shifts.

No work is proposed November 28- December 1; and December 21-January 2. There will be a joint HART and NAN Informational Meeting on December 3 at 6pm at Pearlridge Elementary. The canopy challenge has been resolved thru a redesign. There will be no west bound U-Turns along Kam. Hwy.

Regarding the cultural resource component for the station, Kim Moa, Kehau Lum and Kawika Farm have been in consultation and will follow the proper protocol for consulting parties. An idea for a coloring book or a DOE 4th grade Hawaiian program activity may be proposed.

V. ‘Aiea Library: the November 2nd Book Sale went well. $400 was collected and donated to the Friends of the Library. Children’s books and DVDs sell well. We may want to advertise earlier or place the Book Sale sign in a different location.

VI. New Aloha Stadium Entertainment District (NASED): Many comments were received for the EISP. The draft EIS may come out in January 2020. NASED will be at the Fun Fair A question regarding safety of the facility was posed due to a News story in which an engineer questioned the safety of the Stadium. According to DAGs, the Stadium is safe. There is an annual inspection and an Engineer walks the facility almost daily. Users also inspect areas prior to opening. It is expected that the Stadium will be decommissioned in 3-4 years. Regarding funding, general funds will be used.
There will be a Master Planning Community Workshop on Wed., December 18, 2019 at the Aloha Stadium Hospitality Room. Julie Au of Honua Consulting has contacted community members to gather information regarding cultural practices, oral or ethnographic histories of the area. Please kokua and if you know of individuals who can share their experiences of Halawa? Aiea let Julie or Kehau know.

VII. Loko Pa’aiau- No report

VIII. OCCC Update and Application for PRU zoning application: Katie Stephens of Architect Hawai’i and Nolan Espinda, Director of Public Safety, discussed the proposed prison relocation. The federal prison option and bail reform is not under DPS’s purview. Incarceration of law breakers and re-entry (end of prison term, work furlough) comes under DPS’s purview. The proposal to move to Halawa is “years away” and DPW is in the “early design phase.”

The population in Halawa would be only men. Regarding the use of the Federal Prison, DPS rents space there. The prison proposal may be back at the Legislature in the Public Safety Committee.

IX. ‘Aiea Parade and Fun Fair: December 14, 2019; The Lions Club will marshal the Parade. Parking for volunteers and guest would be at the Church. There will be no parking on the grass or the slab. December 5, meeting proposed at 630pm at the Public Library or McDonalds.

X. ‘Aiea Gateway- Grass has been cut. Need a design for the gateway. Still no water, wall/sign needs to be repaired.

XI. ‘Aiea Recreational Baseball Field- No update.

XII. Membership- No report

XV. Aiea Neighborhood Board- Recess in November.

XVI. Misc.: Red Hill Fuel Tanks: Meeting on November 19, 2019 at Moanalua Middle School at 6pm.

XVII. Info made available/Handouts: See Agenda Announcements; NASED Programmatic Environmental Impact Statement Scoping Meeting and Public Comment Period; NASED Notice of the Master Planning Community Workshop; Claire Tanamoto testimony for NASED; Response to the Aiea Neighborhood Board About Items of Concern Related to the Preferred Location for the O‘ahu Community Correctional Center, dated November 4, 2019.
Appendix F:
Noise Study
ACOUSTIC STUDY FOR THE
ALOHA STADIUM REDEVELOPMENT PROJECT
AIEA, OAHU, HAWAII

Prepared for:
WILSON OKAMOTO CORPORATION

Prepared by:
Y. EBISU & ASSOCIATES
1126 12th Avenue, Room 305
Honolulu, Hawaii 96816

MAY 2020

TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>CHAPTER TITLE</th>
<th>PAGE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Figures</td>
<td>ii</td>
<td></td>
</tr>
<tr>
<td>List of Tables</td>
<td>iv</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>SUMMARY</td>
<td>1</td>
</tr>
<tr>
<td>II</td>
<td>PURPOSE</td>
<td>4</td>
</tr>
<tr>
<td>III</td>
<td>NOISE DESCRIPTORS AND THEIR RELATIONSHIP TO LAND USE COMPATIBILITY</td>
<td>5</td>
</tr>
<tr>
<td>IV</td>
<td>GENERAL STUDY METHODOLOGY</td>
<td>9</td>
</tr>
<tr>
<td>V</td>
<td>EXISTING ACOUSTICAL ENVIRONMENT</td>
<td>18</td>
</tr>
<tr>
<td>VI</td>
<td>FUTURE NOISE ENVIRONMENT</td>
<td>21</td>
</tr>
<tr>
<td>VII</td>
<td>DISCUSSION OF PROJECT-RELATED NOISE IMPACTS AND POSSIBLE MITIGATION MEASURES</td>
<td>25</td>
</tr>
</tbody>
</table>

Traffic Noise                                | 25       |
Sound Levels During Spectator Events         | 25       |
General Construction Noise                   | 40       |

APPENDICES

A  REFERENCES                                      | 45       |
B  EXCERPTS FROM EPA'S ACOUSTICAL TERMINOLOGY GUIDE | 46       |
C  SUMMARY OF BASE YEAR AND YEAR 2026 TRAFFIC VOLUMES DURING AM AND PM PEAK HOURS | 49       |
<table>
<thead>
<tr>
<th>NUMBER</th>
<th>FIGURE TITLE</th>
<th>PAGE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PROJECT LOCATION MAP AND NOISE MEASUREMENT LOCATIONS</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>LAND USE COMPATIBILITY WITH YEARLY AVERAGE DAY-NIGHT AVERAGE SOUND LEVEL (DNL) AT A SITE FOR BUILDINGS AS COMMONLY CONSTRUCTED</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>TRAFFIC NOISE MEASUREMENT LOCATION A</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>TRAFFIC NOISE MEASUREMENT LOCATION B</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>TRAFFIC NOISE MEASUREMENT LOCATION C</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>HOURLY VARIATIONS OF TRAFFIC NOISE AT 78 FT SETBACK DISTANCE FROM THE CENTERLINE OF KAMEHAMEHA HIGHWAY, BETWEEN SALT LAKE BLVD. &amp; FORD IS. BLVD.; (STAs B7200002154; 4/24/18)</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>HOURLY VARIATIONS OF TRAFFIC NOISE AT 33 FT SETBACK DISTANCE FROM THE CENTERLINE OF KAHUAPAANI STREET, BETWEEN MAMAMAII PL./ ALA ALII ST. RAMPS (STAs B72724100027; 6/5/18)</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>LOCATIONS OF 3 OPTIONS FOR ALOHA STADIUM</td>
<td>16</td>
</tr>
<tr>
<td>9</td>
<td>1 HOUR DB VS. TIME RECORD AT LOCATION S1 (BRUNO MARS CONCERT, 1900 TO 2000 HOURS; NOVEMBER 8, 2018)</td>
<td>26</td>
</tr>
<tr>
<td>10</td>
<td>1 HOUR DB VS. TIME RECORD AT LOCATION S1 (BRUNO MARS CONCERT, 2200 TO 2300 HOURS; NOVEMBER 8, 2018)</td>
<td>27</td>
</tr>
<tr>
<td>11</td>
<td>1 HOUR DB VS. TIME RECORD AT LOCATION S1 (MONSTER TRUCK TOUR EVENT, 1900 TO 2000 HOURS; MAY 6, 2019)</td>
<td>28</td>
</tr>
<tr>
<td>12</td>
<td>1 HOUR DB VS. TIME RECORD AT LOCATION S1 (NFL GAME TRAFFIC AND HELICOPTERS, 1500 TO 1600 HOURS; AUGUST 17, 2019)</td>
<td>32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>FIGURE TITLE</th>
<th>PAGE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>1 HOUR DB VS. TIME RECORD AT LOCATION S1 (NFL GAME, 1600 TO 1700 HOURS; AUGUST 17, 2019)</td>
<td>33</td>
</tr>
<tr>
<td>14</td>
<td>2 MINUTE DB VS. TIME RECORD AT LOCATION S1 (NFL GAME FIGHTER JET FLYOVER &amp; FIREWORKS; 1602:45 TO 1604:45 HOURS; AUGUST 17, 2019)</td>
<td>34</td>
</tr>
<tr>
<td>15</td>
<td>2 MINUTE DB VS. TIME RECORD AT LOCATION S1 (NFL GAME FIREWORKS; 1919 TO 1921 HOURS; AUGUST 17, 2019)</td>
<td>35</td>
</tr>
<tr>
<td>16</td>
<td>3 MINUTE DB VS. TIME RECORD AT LOCATION S1 (NFL GAME SHORT DURATION CROWD NOISE; 1743 TO 1746 HOURS; AUGUST 17, 2019)</td>
<td>36</td>
</tr>
<tr>
<td>17</td>
<td>1 MINUTE DB VS. TIME RECORD AT LOCATION S1 (NFL GAME LONG DURATION CROWD NOISE; 1821 TO 1822 HOURS; AUGUST 17, 2019)</td>
<td>37</td>
</tr>
<tr>
<td>18</td>
<td>RANGES OF CONSTRUCTION EQUIPMENT NOISE LEVELS</td>
<td>41</td>
</tr>
<tr>
<td>19</td>
<td>ANTICIPATED RANGE OF CONSTRUCTION NOISE LEVELS VS. DISTANCE</td>
<td>42</td>
</tr>
<tr>
<td>20</td>
<td>AVAILABLE WORK HOURS UNDER DOH PERMIT PROCEDURES FOR CONSTRUCTION NOISE</td>
<td>44</td>
</tr>
</tbody>
</table>
CHAPTER I. SUMMARY

The existing and future traffic noise levels in the vicinity of the proposed Aloha Stadium Redevelopment project in Aiea were evaluated for their potential impacts and their relationship to current Federal Housing Administration (FHA) / Housing and Urban Development (HUD) noise standards for residences. The traffic noise level increases along the roadways which provide access to and from the project site (see Figure 1) were calculated. Significant increases in traffic noise levels are not expected to occur as a result of project traffic following completion of the new stadium and Phase 1 by CY 2026.

Along Salt Lake Boulevard, traffic noise levels are expected to increase from a range of 62 to 72 DNL in 2019 at 100 foot distance from the roadway’s centerline to a range of 67 to 69 DNL in CY 2026. Along Kamehameha Highway, traffic noise levels are expected to remain within a range of 70 to 72 DNL at 100 feet from the centerline between 2019 and 2026. Along Kaaawa Street, traffic noise levels are expected to increase from a range of 71 to 73 DNL in 2019 at 100 foot distance from the roadway’s centerline to a range of 72 to 74 DNL in CY 2026. Project traffic will add less than 0.8 additional DNL units of noise along Salt Lake Boulevard, Kamehameha Highway, and Kaaawa Street during the AM or PM peak commuting periods. These traffic noise level increases resulting from project-generated traffic during the peak commuting periods are not considered to be significant. The predicted increases in non-project traffic noise levels are expected to be similar or slightly higher than those from project traffic by CY 2026.

Spectator events at Aloha Stadium (football games, concerts, motor vehicle events, etc.) may raise traffic noise levels prior to and following each event. The much higher traffic volumes associated with these spectator events will tend to reduce average vehicle speeds along the roadways used to access and depart from the stadium, and therefore, moderate the peak traffic noise levels along these roadways, but also extend the duration of the moderate peak traffic noise levels.

The noise emissions from the stadium during special events will exceed normal background noise levels at the closest residential communities. The louder emissions may be associated with amplified voice and music, crowd noise, motor vehicle and motorcycle engine and exhaust noise, fireworks, and fighter aircraft flyovers. The sound levels associated with these special event emissions will vary with the final siting of the stadium within the existing project area. Calculations of the anticipated sound levels associated with these emissions were performed for the three candidate locations identified for the stadium.

For existing noise sensitive receptors which are adjacent to the Aloha Stadium project site, if approximately three spectator events per week occur at the preferred new site of the stadium, the annually averaged noise level associated with these spectator events should not exceed the FHA/HUD 65 DNL standard for noise sensitive land uses.
However, at planned new residences which are located within 200 to 500 feet distance from the stadium, the annually averaged noise level associated with these spectator events may exceed the 65 DNL standard, and require noise mitigation measures at these locations.

Unavoidable, but temporary, noise impacts may occur during construction of the proposed project, particularly during the excavation and potential pile driving activities on the project site. Because construction activities are predicted to be audible within the project site and at adjoining properties, the quality of the acoustic environment may be degraded to levels exceeding 60 dBA during periods of construction. Mitigation measures to reduce construction noise to inaudible levels will not be practical in all cases, but the use of quiet equipment is recommended as a standard mitigation measure.
CHAPTER II. PURPOSE

The primary objective of this study was to describe the existing and future traffic noise environment in the environs of the proposed Aloha Stadium Redevelopment Project located within the existing stadium property on the island of Oahu. Traffic forecasts from the project traffic study for 2028 were used. Traffic noise level increases and impacts associated with the proposed development were to be determined along the public roadways which are expected to service the project traffic. A specific objective was to determine future traffic noise level increases both with and without the project, and the potential noise impacts associated with these increases.

Predicted changes in noise levels associated with spectator events at the closest residential communities to the Aloha Stadium were examined for three candidate siting options for the stadium. These predictions were made to quantify the anticipated changes in noise levels at the residential communities during spectator events for each of the three candidate stadium siting options.

Impacts from short term construction noise at the project site were also included as noise study objectives. Recommendations for minimizing construction noise impacts are also provided.

CHAPTER III. NOISE DESCRIPTORS AND THEIR RELATIONSHIP TO LAND USE COMPATIBILITY

The noise descriptor currently used by federal agencies (such as FHA/HUD) to assess environmental noise is the Day-Night Average Sound Level (DNL or DNL). This descriptor incorporates a 24-hour average of instantaneous A-Weighted Sound Levels as read on a standard Sound Level Meter. By definition, the minimum averaging period for the DNL descriptor is 24 hours. Additionally, sound levels which occur during the nighttime hours of 10:00 PM to 7:00 AM are increased by 10 decibels (dB) prior to computing the 24-hour average by the DNL descriptor. A more complete list of noise descriptors is provided in Appendix B to this report.

Table 1, derived from Reference 1, presents current federal noise standards and acceptability criteria for residential land uses. Land use compatibility guidelines for various levels of environmental noise as measured by the DNL descriptor system are shown in Figure 2. As a general rule, noise levels of 65 DNL or less occur in rural areas, or in areas which are removed from high volume roadways. In urbanized areas which are shielded from high volume streets, DNL levels generally range from 55 to 65 DNL, and are usually controlled by motor vehicle traffic noise. Residences which front major roadways are generally exposed to levels of 65 DNL, and as high as 75 DNL when the roadway is a high speed freeway. In the project area, traffic noise levels associated with Kamehameha Highway, Salt Lake Boulevard, and Kahua Kai Street are typically greater than 65 DNL along their Rights-of-Way due to the large volumes of traffic on those major thoroughfares.

For purposes of determining noise acceptability for funding assistance from federal agencies (FHA/HUD and VA), an exterior noise level of 65 DNL or less is considered acceptable for residences. This standard is applied nationally (Reference 2), including Hawaii. Because of our open living conditions, the predominant use of naturally ventilated dwellings, and the relatively low exterior-to-interior sound attenuation afforded by these naturally ventilated structures, an exterior noise level of 65 DNL does not eliminate all risks of noise impacts. Because of these factors, and as recommended in Reference 3, a lower level of 55 DNL is considered as the "Unconditionally Acceptable" (or "Near-Zero Risk") level of exterior noise. However, after considering the cost and feasibility of applying the lower level of 55 DNL, government agencies such as FHA/HUD and VA have selected 65 DNL as a more appropriate regulatory standard.

For commercial, industrial, and other non-noise sensitive land uses, exterior noise levels as high as 75 DNL are generally considered acceptable. Exceptions to this occur when naturally ventilated office and other commercial establishments are exposed to exterior levels which exceed 65 DNL.

On the island of Oahu, the State Department of Health (DOH) regulates noise from construction activities, through the issuance of permits for allowing excessive
# Table 1

**Exterior Noise Exposure Classification**

<table>
<thead>
<tr>
<th>Noise Exposure Class</th>
<th>Day-Night Sound Level</th>
<th>Equivalent Sound Level</th>
<th>Federal (1) Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal Exposure</td>
<td>Not Exceeding 55 DNL</td>
<td>Not Exceeding 55 Leq</td>
<td>Unconditionally Acceptable</td>
</tr>
<tr>
<td>Moderate Exposure</td>
<td>Above 55 DNL</td>
<td>Above 55 Leq</td>
<td>Acceptable(2)</td>
</tr>
<tr>
<td>Significant Exposure</td>
<td>Above 65 DNL</td>
<td>Above 65 Leq</td>
<td>Normally Unacceptable</td>
</tr>
<tr>
<td>Severe Exposure</td>
<td>Above 75 DNL</td>
<td>Above 75 Leq</td>
<td>Unacceptable</td>
</tr>
</tbody>
</table>

Notes: (1) Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

(2) FHWA uses the Leq instead of the Ldn descriptor. For planning purposes, both are equivalent if: (a) heavy trucks do not exceed 10 percent of total traffic flow in vehicles per 24 hours, and (b) traffic between 10:00 PM and 7:00 AM does not exceed 15 percent of average daily traffic flow in vehicles per 24 hours. The noise mitigation threshold used by FHWA for residences is 67 Leq.

---

# Figure 2

**Land Use Compatibility with Yearly Average Day-Night Average Sound Level (DNL) at a Site for Buildings as Commonly Constructed.**

(Source: American National Standards Institute 512.9-1998/Part 8)
noise during limited time periods. State DOH noise regulations are expressed in maximum allowable property line noise limits rather than DNL. Although they are not directly comparable to noise criteria expressed in DNL, State DOH noise limits for residential, commercial, and industrial lands equate to approximately 55, 60, and 76 DNL, respectively. State DOH noise limits apply primarily to fixed mechanical equipment, and are not applied to amplified music, crowd noise, motor vehicles, etc.

It should be noted that the noise compatibility guidelines and relationships to the DNL noise descriptor may not be applicable to impulsive noise sources such as pile drivers. The use of penalty factors (such as adding 10 dB to measured sound levels or the use of C-Weighting filters) have been proposed. However, the relationships between levels of impulsive noise sources and land use compatibility have not been as firmly established as have the relationships for non-impulsive sources. The State DOH limits for impulsive sounds which exceed 120 impulses in any 20 minute period are 10 dB above the limits for non-impulsive sounds. If impulsive sounds do not exceed 120 impulses in any 20 minute time period, there are no regulatory limits on their sound levels under the State DOH regulations.

CHAPTER IV. GENERAL STUDY METHODOLOGY

Existing traffic noise levels were measured at three locations (A, B, and C) in the project environs to provide a basis for developing the project’s traffic noise contributions along the roadways which will service the proposed development. The locations of the traffic measurement sites are shown in Figures 1, 3, 4, and 5. Traffic noise measurements were performed during the months of April and May 2018. The results of the traffic noise measurements were compared with calculations of existing traffic noise levels to validate the computer model used. The traffic noise measurement results, and their comparisons with computer model predictions of existing traffic noise levels are summarized in Table 2.

Traffic noise calculations for the existing conditions as well as noise predictions for 2026 were performed using the Federal Highway Administration (FHWA) Traffic Noise Model (Reference 5). Traffic data entered into the noise prediction model were: roadway and receiver locations; hourly traffic volumes, average vehicle speeds; estimates of traffic mix; and "Pavement" propagation loss factor. The traffic data and forecasts for the project (Reference 6), plus the spot traffic counts obtained during the noise measurement periods were the primary sources of data inputs to the model. Appendix C summarizes the AM and PM peak hour traffic volumes for CY 2019 and 2026, which were used to model existing and future traffic noise along the streets servicing the project site. Year 2019 and 2026 traffic data from Reference 6 were used to model existing and future traffic noise levels in the project environs. For existing and future traffic along the streets surrounding the project site, it was assumed that the average noise levels, or Leq(h), during the PM and AM peak traffic hours were approximately 1.0 and 1.7 dB less, respectively, than their 24-hour DNL’s. These Leq(h) to DNL conversion factors were obtained from calculations of traffic noise levels along Kamahameha Highway and Kahuaapana Street (see Figures 6 and 7) based on 24-hour traffic counts provided in References 7 and 8.

Traffic noise calculations for both the existing and future conditions in the project environs were developed for ground level receptors. Traffic noise levels were also calculated for future conditions with and without the proposed project. The forecasted changes in traffic noise levels over existing levels were calculated with and without the project, and noise impact risks evaluated. The relative contributions of non-project and project traffic to the total noise levels were also calculated, and an evaluation of possible traffic noise impacts was made.

Measurements of noise levels associated with spectator events at Aloha Stadium were obtained during a Bruno Mars concert on November 8, 2018, during a Monster Truck Tour event on May 5, 2019, and during an NFL football exhibition game on August 17, 2019. Sound level measurements were obtained inside the stadium as well as outside the stadium at Location S1 where shown in Figures 1 and 8. Location S1 was approximately 1,100 feet from the center of the stadium, and was used to measure the A-Weighted sound level and frequency spectrum of amplified public address announcements, concert music and vocals, trucks and motorcycles, crowd noise, and
### TABLE 2

**TRAFFIC AND BACKGROUND NOISE MEASUREMENT RESULTS**

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>Time of Day</th>
<th>Ave. Speed</th>
<th>Hourly Traffic Volume</th>
<th>Measured</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 93 FT from the centerline of Kahuapaani Street (4/30/19)</td>
<td>0700 TO 0800</td>
<td>45</td>
<td>1,775</td>
<td>49</td>
<td>58</td>
</tr>
<tr>
<td>A. 93 FT from the centerline of Kahuapaani Street (4/30/19)</td>
<td>1500 TO 1600</td>
<td>45</td>
<td>1,939</td>
<td>40</td>
<td>36</td>
</tr>
<tr>
<td>B. 60 FT from the centerline of Salt Lake Boulevard (5/16/19)</td>
<td>0700 TO 0800</td>
<td>35</td>
<td>1,238</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>B. 60 FT from the centerline of Salt Lake Boulevard (5/16/19)</td>
<td>1500 TO 1600</td>
<td>35</td>
<td>1,265</td>
<td>20</td>
<td>26</td>
</tr>
<tr>
<td>C. 78 FT from the centerline of Kamohanahe Highway (5/21/19)</td>
<td>0700 TO 0800</td>
<td>45</td>
<td>2,027</td>
<td>32</td>
<td>83</td>
</tr>
<tr>
<td>C. 78 FT from the centerline of Kamohanahe Highway (5/21/19)</td>
<td>1500 TO 1600</td>
<td>45</td>
<td>2,994</td>
<td>26</td>
<td>48</td>
</tr>
</tbody>
</table>
fireworks. The results from these measurements were used to predict the potential
oise levels during similar spectator events at the possible future stadium locations
under Options A, B, and C where shown in Figure 8. Predicted noise levels associated
with spectator events were calculated at residential areas closest to the Aloha Stadium
site for the purpose of evaluating and comparing the potential noise levels during
spectator events at the three stadium location options.

Calculations of average exterior and interior noise levels from construction
activities were performed for typical naturally ventilated and air conditioned dwellings.
Predicted noise levels were compared with existing background ambient noise levels,
and the potential for noise impacts was assessed. Potential noise impacts from pile
driving operations were also discussed, and mitigation measures recommended.
V. EXISTING ACOUSTICAL ENVIRONMENT

The existing background ambient noise levels within the project area are controlled by traffic along Kamehameha Highway, Salt Lake Boulevard, H-1 Freeway, and Kahuaapuni Street. The results of the traffic noise measurements are summarized in Table 2. The "Predicted Leq" column results shown in Table 2 are the results from the traffic noise model (FHWA THM Version 2.5) using the traffic volume and speed assumptions shown in Table 2. As shown in Table 2, correlation between measured and predicted traffic noise levels was good, but only model outputs were increased by 1.3 to 2.2 Leq. The traffic noise model's "Pavement" propagation loss factor was used to obtain the predicted values shown in Table 2.

The existing traffic noise levels in the project environs along Kamehameha Highway, Salt Lake Boulevard, H-1 Freeway, and Kahuaapuni Street are in the "Significant Exposure, Normal Unacceptable" category by current federal standards for residences on the roadway frontage lots, and greater than 65 DNL at frontage lots within 59 to 200+ feet of the roadways' centerlines. Behind the frontage lots, the first row of buildings typically attenuate traffic noise levels due to shielding effects of 4 to 9 dB per row of buildings. Distance effects between the residences and the roadways add additional 2 to 4 dB of attenuation at the second and third row of lots from the roadway.

Using the existing traffic volumes shown in Appendix C, Table 3 presents the results of calculations of existing traffic noise levels along roadways that would be used for access to Aloha Stadium at 50, 100, and 200 feet from the roadways' centerlines. Existing DNL values are approximately 0.8 to 1.7 dB higher than the peak hour Leq's shown in Table 2. Table 4 presents the existing setback distances to the 65, 70, and 75 DNL contours from the various sections of Kamehameha Highway, Salt Lake Boulevard, and Kahuaapuni Street when visual line-of-sight conditions exist between the roadway vehicles and the receptor. The results shown in Tables 3 and 4 are worst case conditions, since they do not include the beneficial effects of noise shielding from terrain features or existing buildings.

Prior to and following spectator events at Aloha Stadium, traffic volumes on the streets servicing the stadium are expected to be higher than those during the weekday peak traffic hour. Although these traffic volumes are probably higher during spectator events than during the peak commuting hour on weekdays, the average vehicle speeds are lower due to the increased traffic congestion which occurs prior to and following the spectator events. Reductions in average vehicle speeds by 10 to 15 miles per hour are predicted to result in traffic noise level reductions of 3 to 4 dB. For these reasons, and due to the greater number of weekday commuting days than the total number of spectator event days during each year, the traffic volumes shown in Appendix C and Table 3 should control the annually averaged DNL values of existing traffic noise levels along the roadways which service Aloha Stadium.
## Table 4

**EXISTING AND CY 2026 DISTANCES TO 65, 70, AND 75 DNL CONTOURS**

<table>
<thead>
<tr>
<th>STREET SECTION</th>
<th>65 DNL SETBACK (FT)</th>
<th>70 DNL SETBACK (FT)</th>
<th>75 DNL SETBACK (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EXISTING CY 2026</td>
<td>EXISTING CY 2026</td>
<td>EXISTING CY 2026</td>
</tr>
<tr>
<td>Salt Lake Blvd. S. of Kahuapaani St, PM</td>
<td>214</td>
<td>227</td>
<td>82</td>
</tr>
<tr>
<td>Salt Lake Blvd. Between Kahuapaani &amp; Kalakaua, PH</td>
<td>74</td>
<td>166</td>
<td>59</td>
</tr>
<tr>
<td>Salt Lake Blvd. Between Kalakaua &amp; Stadium, PM</td>
<td>126</td>
<td>153</td>
<td>50</td>
</tr>
<tr>
<td>Kahuapaani St. Between Ulune &amp; Ala Alii (S), AM</td>
<td>423</td>
<td>501</td>
<td>166</td>
</tr>
<tr>
<td>Kahuapaani St. Between Alaka Alii &amp; Salt Lake (N), A</td>
<td>426</td>
<td>490</td>
<td>149</td>
</tr>
<tr>
<td>Kahuapaani St. Between Ulune &amp; Ala Alii (S), AM</td>
<td>372</td>
<td>430</td>
<td>149</td>
</tr>
<tr>
<td>Kahuapaani St. Between Alaka Alii &amp; Salt Lake (S), A</td>
<td>389</td>
<td>434</td>
<td>133</td>
</tr>
<tr>
<td>Kamehameha Hwy. S. of Ford Island Bridge, PM</td>
<td>327</td>
<td>364</td>
<td>131</td>
</tr>
<tr>
<td>Kamehameha Hwy. E. of Hooomau St., PM</td>
<td>275</td>
<td>302</td>
<td>108</td>
</tr>
</tbody>
</table>

**Notes:**
(1) All setback distances are from the roadways' centerlines or medians.
(2) See Tables 3 and 5 for traffic volume, speed, and mix assumptions.
(3) Setback distances are for unobstructed line-of-sight conditions.
(4) "Pavement" conditions assumed along all roadways.

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**Future Noise Environment**

Predictions of future traffic noise levels were made using the traffic volume assignments of Reference 6 for CY 2006 and CY 2026 with and without the project (in parentheses). The project includes noise reductions from a combination of noise barriers, sound walls, and other mitigation measures. The CY 2026 projections were developed using the latest data and methodology. The reductions in traffic noise levels under the project were determined through the mitigation methods described in Table 6. The project was designed to meet the requirements of the FHWA’s noise guidelines. The noise levels associated with the project and non-project traffic were calculated using the FHWA’s noise exposure model. The noise levels were then compared to the Federal Highway Administration’s noise exposure guidelines. The project is expected to achieve the noise level targets set by the FHWA, with reductions observed along all sections of Salt Lake Boulevard, Kahuapaani Street, and Kamehameha Highway under the project. The noise levels associated with the project are also expected to be lower than those under the non-project conditions. The future noise environment is expected to be improved due to the project’s noise mitigation measures.
### Table 5

**Future (CY 2026) Traffic Volumes and Noise Levels Along Roadways in Project Area**

<table>
<thead>
<tr>
<th>Location</th>
<th>Speed (MPH)</th>
<th>Total VPH</th>
<th>Autos</th>
<th>M Trucks</th>
<th>H Trucks</th>
<th>50' Leq</th>
<th>100' Leq</th>
<th>200' Leq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt Lake Blvd. S. of Kehuapaani St., PM</td>
<td>35</td>
<td>2,531</td>
<td>43</td>
<td>54</td>
<td>72.1</td>
<td>68.2</td>
<td>64.7</td>
<td></td>
</tr>
<tr>
<td>Salt Lake Blvd. Between Kehuapaani &amp; Kalalau, PM</td>
<td>35</td>
<td>1,735</td>
<td>29</td>
<td>37</td>
<td>70.5</td>
<td>66.0</td>
<td>63.1</td>
<td></td>
</tr>
<tr>
<td>Salt Lake Blvd. Between Kalalau &amp; Stadium, PM</td>
<td>35</td>
<td>1,506</td>
<td>27</td>
<td>34</td>
<td>70.1</td>
<td>66.2</td>
<td>62.7</td>
<td></td>
</tr>
<tr>
<td>Kehuapaani St. Between Uluru &amp; Ala Alii (N), AM</td>
<td>45</td>
<td>2,323</td>
<td>53</td>
<td>58</td>
<td>76.6</td>
<td>71.9</td>
<td>68.2</td>
<td></td>
</tr>
<tr>
<td>Kehuapaani St. Between Uluru &amp; Ala Alii (S), AM</td>
<td>45</td>
<td>2,323</td>
<td>53</td>
<td>58</td>
<td>74.8</td>
<td>71.1</td>
<td>67.7</td>
<td></td>
</tr>
<tr>
<td>Kehuapaani St. Between Ala Alii &amp; Salt Lake (N), AM</td>
<td>45</td>
<td>2,017</td>
<td>46</td>
<td>50</td>
<td>76.0</td>
<td>71.3</td>
<td>67.5</td>
<td></td>
</tr>
<tr>
<td>Kehuapaani St. Between Ala Alii &amp; Salt Lake (S), AM</td>
<td>45</td>
<td>2,017</td>
<td>46</td>
<td>50</td>
<td>74.2</td>
<td>70.5</td>
<td>67.1</td>
<td></td>
</tr>
<tr>
<td>Kanehamieha Hwy. S. of Ford Island Bridge, PM</td>
<td>45</td>
<td>2,589</td>
<td>28</td>
<td>70</td>
<td>76.1</td>
<td>71.1</td>
<td>67.4</td>
<td></td>
</tr>
<tr>
<td>Kanehamieha Hwy. E. of Hoohoonu St., PM</td>
<td>35</td>
<td>4,237</td>
<td>61</td>
<td>59</td>
<td>74.9</td>
<td>69.8</td>
<td>66.2</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

- For Kehuapaani Street, "(N)" indicates that Leq results apply on north side of roadway.
- For Kehuapaani Street, "(S)" indicates that Leq results apply on south side of roadway.

### Table 6

**Calculations of Project and Non-Project Traffic Noise Contributions (CY 2026)**

<table>
<thead>
<tr>
<th>Street Section</th>
<th>Noise Level Increase Due to Project Traffic</th>
<th>Noise Level Increase Due to Non-Project Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>0.2</td>
<td>0.3</td>
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<tr>
<td></td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>0.6</td>
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<td></td>
<td>0.6</td>
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<td></td>
<td>0.8</td>
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<td></td>
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</tbody>
</table>

Page 23
CHAPTER VII. DISCUSSION OF PROJECT-RELATED NOISE IMPACTS AND POSSIBLE MITIGATION MEASURES

Traffic Noise. Noise impacts at existing noise sensitive receptors resulting from project related traffic along the surrounding roadways which are expected to service the project are not expected since traffic noise increases associated with project traffic are not significant. Existing and future traffic noise levels in the project area are relatively high due to the number of high volume roadways in the project area, with some roadways being high speed freeways. Future residential and hotel uses on the project site may unavoidably occur in the high noise zones, particularly if they involve high rise buildings with direct lines of sight to the roadways. Exceedance of the 65 DNL FHWA/HUD standard and the 66 Leq FHWA/HDOT noise abatement threshold are to be expected. Traffic noise mitigation measures in the form of closure and air conditioning will probably be the most common noise mitigation measure used at these future residential and hotel developments.

Sound Levels During Spectator Events. Sound level measurements of spectator events (Bruno Mars Concert, Monster Truck Tour, and NFL Football Game) at Aloha Stadium were obtained at Location S1 and used to develop predictions of their associated sound levels during similar spectator events at the residential communities closest to the Aloha Stadium. These sound level predictions were also made for the three possible stadium sites (Options A, B, and C) shown in Figure 8.

Figures 9 and 10 depict the increases in background noise levels at measurement Location S1 during the Bruno Mars Concert at Aloha Stadium on November 8, 2018. The strip charts depict the changes in the A-Weighted (LAEQ) and Un-Weighted (LZEO) sound levels at the start of the concert at 7:30 pm and during pauses in the music between 10:12 and 10:27 pm. The A-Weighted sound levels were controlled by the amplified middle and high frequency music and voices, as well as by crowd noise. The Un-Weighted sound levels were controlled by the low frequency, amplified, music. Measured sound levels at Location S1 increased by approximately 10 dBA (LAEQ) and by approximately 20 dBL (LZEO) during the Bruno Mars Concert.

Figure 11 depicts the increases in background noise levels at measurement Location S1 during a Monster Truck Tour Event at Aloha Stadium on May 5, 2019. The noise from the trucks were intermittent and associated with the engine casing and exhaust noise from the various trucks. Sound level records were obtained simultaneously inside the Stadium at Section F, Row 31, Seat 5 as well as outside at measurement Location S1. Table 7 presents a tabulation of the intermittent noise events from the Monster Trucks, fireworks, and crowd noise during the Monster Truck Tour Event. During these events, amplified voice announcements and the noise from motorcycles also occurred. As indicated in Figure 11, amplified low frequency sounds, similar to those present during the Bruno Mars Concert, were not present during the Monster Truck Tour Event.
### TABLE 7 (CONTINUED)
**COMPARISON OF SOUND LEVELS INSIDE AND OUTSIDE ALOHA STADIUM DURING MONSTER TRUCK TOUR EVENT; MAY 5, 2019**

<table>
<thead>
<tr>
<th>EVENT</th>
<th>START</th>
<th>END</th>
<th>STADIUM L_max (dBA)</th>
<th>LOC S1 L_max (dBA)</th>
<th>DELTA (dBA)</th>
<th>NOISE SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>21:59:56</td>
<td>21:59:59</td>
<td>103.4</td>
<td>76.6</td>
<td>26.8</td>
<td>Monster Trucks</td>
</tr>
<tr>
<td>33</td>
<td>22:08:00</td>
<td>22:06:12</td>
<td>105</td>
<td>76.9</td>
<td>28.1</td>
<td>Monster Trucks</td>
</tr>
<tr>
<td>34</td>
<td>22:09:27</td>
<td>22:09:34</td>
<td>106.1</td>
<td>75.9</td>
<td>30.2</td>
<td>Monster Trucks</td>
</tr>
<tr>
<td>35</td>
<td>22:11:46</td>
<td>22:12:02</td>
<td>107.3</td>
<td>79.7</td>
<td>27.6</td>
<td>Monster Trucks</td>
</tr>
<tr>
<td>36</td>
<td>22:19:35</td>
<td>22:19:46</td>
<td>106.2</td>
<td>77</td>
<td>23.2</td>
<td>Monster Trucks</td>
</tr>
</tbody>
</table>

**Addition, Crowd Noise**

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19:40:39</td>
<td>19:40:47</td>
<td>99.3</td>
<td>78.6</td>
<td>20.7</td>
<td>Crowd</td>
</tr>
<tr>
<td>2</td>
<td>20:01:17</td>
<td>20:01:27</td>
<td>104.5</td>
<td>73.6</td>
<td>30.9</td>
<td>Crowd</td>
</tr>
<tr>
<td>3</td>
<td>20:25:12</td>
<td>20:25:19</td>
<td>100.8</td>
<td>74.1</td>
<td>26.7</td>
<td>Crowd</td>
</tr>
<tr>
<td>4</td>
<td>21:20:05</td>
<td>21:23:12</td>
<td>107.5</td>
<td>74.9</td>
<td>32.6</td>
<td>Crowd</td>
</tr>
<tr>
<td>5</td>
<td>22:12:10</td>
<td>22:12:31</td>
<td>106.5</td>
<td>73.8</td>
<td>32.7</td>
<td>Crowd</td>
</tr>
</tbody>
</table>

| Ave. for Monster Trucks: | 105.8 | 78.1 | 27.7 |
| Ave. for Fireworks: | 99.75 | 75.15 | 24.6 |
| Ave. for Crowds: | 103.68 | 75 | 28.7 |

Figures 12 and 13 depict the increases in background noise levels at measurement Location S1 during a NFL football exhibition at Aloha Stadium on August 17, 2019. The loudest noise events were associated with a lighter jet flyover and a few fireworks prior to the start of the football game (see Figure 14), fireworks following the game (see Figure 15), and crowds during the game (see Figures 16 and 17). Crowd noise occurrences were relatively short in duration and less than 15 seconds (see Figure 15), as well as very long and approximately 33 seconds in duration (see Figure 17). Low frequency noise was present during the jet flyover and fireworks events, and absent during the crowd noise events.

Table 8 presents the predicted noise levels which could be anticipated during a rock concert, Monster Truck Tour, and NFL football game at Aloha Stadium, at noise sensitive receptors located north, south, northeast, and southeast of the three potential locations for the new stadium shown in Figure 8. Under Option A, future noise levels at the surrounding noise sensitive receptors should be identical to existing noise levels. Under Option B, noise levels during spectator events would increase slightly (less than 1 dBA) at residences to the north and increase by slightly over 1 to 2 dBA at residences to the south; and decrease by 2 to 4 dBA at residences to the northeast and southeast. Under Option C, the noise levels would experience the greatest reductions of 5 to 7 dBA, and residences to the northeast should experience a reduction of approximately 2 dBA, and residences to the south should experience an increase of 2 to 3 dBA. Overall, the predicted changes in sound levels from Aloha Stadium at the surrounding noise sensitive receptors under the three potential locations for the new stadium correlate with the changes (increases or decreases) in buffer distances between the noise sensitive receptors and the stadium.

Estimates were made of the annually averaged DNL associated with spectator events at Aloha Stadium for comparison with the FHA/HUD 65 DNL noise standard for noise sensitive receptors. The DNL value of each of the three events (Bruno Mars Concert, Monster Truck Tour, and NFL Football) were calculated at Location S1, with the average DNL of each event calculated from the background noise corrected sound levels measured during each event, and with nighttime (after 10:00 pm) sound levels penalized with the 10 dB increase associated with the DNL metric.

Estimates of the number of similar spectator events (including local high school and college football games) at Aloha Stadium were obtained and used to calculate the annually averaged DNL associated with spectator noise events at Location S1. Location S1 was approximately 1,025 feet from center of Aloha Stadium, while the buffer distances between the stadium and noise sensitive residences range from 1,050 to 2,175 feet. So, the DNL value calculated at Location S1 should be representative of the DNL value of spectator events at the residences closest to Aloha Stadium to the south along Salt Lake Boulevard. Under Options B and C, the residences to the south along Salt Lake Boulevard will have the smallest buffer distances to the stadium at 900 feet.
### TABLE 8
COMPARISONS OF AVERAGE SOUND LEVELS FROM VARIOUS SOURCES DURING SPECTATOR EVENTS

#### A. Predicted Sound Levels at Closest Residences to North:

<table>
<thead>
<tr>
<th>STADIUM EVENT</th>
<th>OPTION A</th>
<th>OPTION B</th>
<th>OPTION C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock Concert</td>
<td>68.4</td>
<td>69.0</td>
<td>62.8</td>
</tr>
<tr>
<td>Monster Truck</td>
<td>72.9</td>
<td>73.5</td>
<td>66.3</td>
</tr>
<tr>
<td>NFL Football Game Fireworks</td>
<td>82.6</td>
<td>83.2</td>
<td>78.2</td>
</tr>
<tr>
<td>Crowd Noise (Bruno Mars)</td>
<td>63.7</td>
<td>64.3</td>
<td>57.3</td>
</tr>
<tr>
<td>Crowd Noise (Monster Truck)</td>
<td>68.4</td>
<td>69.0</td>
<td>61.5</td>
</tr>
<tr>
<td>Crowd Noise (NFL Game)</td>
<td>70.1</td>
<td>70.7</td>
<td>63.2</td>
</tr>
</tbody>
</table>

#### B. Predicted Sound Levels at Closest Residences to South:

<table>
<thead>
<tr>
<th>STADIUM EVENT</th>
<th>OPTION A</th>
<th>OPTION B</th>
<th>OPTION C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock Concert</td>
<td>71.6</td>
<td>73.3</td>
<td>74.2</td>
</tr>
<tr>
<td>Monster Truck</td>
<td>75.6</td>
<td>78.3</td>
<td>79.4</td>
</tr>
<tr>
<td>NFL Football Game Fireworks</td>
<td>85.9</td>
<td>87.5</td>
<td>88.4</td>
</tr>
<tr>
<td>Crowd Noise (Bruno Mars)</td>
<td>67.5</td>
<td>69.6</td>
<td>70.8</td>
</tr>
<tr>
<td>Crowd Noise (Monster Truck)</td>
<td>72.1</td>
<td>73.9</td>
<td>74.9</td>
</tr>
<tr>
<td>Crowd Noise (NFL Game)</td>
<td>73.6</td>
<td>75.6</td>
<td>76.6</td>
</tr>
</tbody>
</table>

#### C. Predicted Sound Levels at Closest Residences to Northeast:

<table>
<thead>
<tr>
<th>STADIUM EVENT</th>
<th>OPTION A</th>
<th>OPTION B</th>
<th>OPTION C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock Concert</td>
<td>63.1</td>
<td>60.5</td>
<td>61.4</td>
</tr>
<tr>
<td>Monster Truck</td>
<td>66.6</td>
<td>63.4</td>
<td>64.5</td>
</tr>
<tr>
<td>NFL Football Game Fireworks</td>
<td>76.5</td>
<td>73.4</td>
<td>74.4</td>
</tr>
<tr>
<td>Crowd Noise (Bruno Mars)</td>
<td>57.6</td>
<td>54.6</td>
<td>55.6</td>
</tr>
<tr>
<td>Crowd Noise (Monster Truck)</td>
<td>61.8</td>
<td>58.3</td>
<td>59.5</td>
</tr>
<tr>
<td>Crowd Noise (NFL Game)</td>
<td>65.5</td>
<td>60.2</td>
<td>61.3</td>
</tr>
</tbody>
</table>

#### D. Predicted Sound Levels at Closest Residences to Southeast:

<table>
<thead>
<tr>
<th>STADIUM EVENT</th>
<th>OPTION A</th>
<th>OPTION B</th>
<th>OPTION C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock Concert</td>
<td>65.4</td>
<td>62.7</td>
<td>70.1</td>
</tr>
<tr>
<td>Monster Truck</td>
<td>69.3</td>
<td>66.1</td>
<td>74.8</td>
</tr>
<tr>
<td>NFL Football Game Fireworks</td>
<td>79.3</td>
<td>75.0</td>
<td>84.4</td>
</tr>
<tr>
<td>Crowd Noise (Bruno Mars)</td>
<td>60.2</td>
<td>57.1</td>
<td>65.7</td>
</tr>
<tr>
<td>Crowd Noise (Monster Truck)</td>
<td>64.7</td>
<td>61.3</td>
<td>70.3</td>
</tr>
<tr>
<td>Crowd Noise (NFL Game)</td>
<td>66.4</td>
<td>63.0</td>
<td>72.0</td>
</tr>
</tbody>
</table>
and 823 feet, respectively. Under Option A, predicted DNL at Location S1 and at the closest Salt Lake Boulevard residences was 57 DNL with approximately 3 events per week. Predicted DNL values under Options B and C should be 1 and 2 DNL units greater than the predicted DNL value at Location S1 or at the closest Salt Lake Boulevard residences under Option A. These levels are well below the 65 DNL FHA/HUD standard for noise sensitive receptors, and from this result, it was concluded that stadium noise emissions from spectator events should not cause adverse noise impacts at existing noise sensitive receptors.

At the closest planned residences under Phase 1 of Option B, where buffer distances to the preferred Aloha Stadium location are in the order of 200 to 500 feet, spectator event noise levels may be 6 to 10 DNL units greater than the reference level of 57 DNL at Location S1. These levels may exceed the 65 DNL FHA/HUD threshold at the closest residences, and special sound attenuation measures may be required at the closest planned residences. Under Phase 2 and 3 of Option B, spectator event noise levels at the closest planned residences are predicted to range from 58 to 64 DNL and would not require special sound attenuation measures due to spectator events.

General Construction Noise. Audible construction noise will probably be unavoidable during the entire project construction period. The total time period for construction is unknown, but it is anticipated that the actual work will be moving from one location on the project site to another during that period. Actual length of exposure to construction noise at any receptor location will probably be less than the total construction period for the entire project. Figure 18 depicts the range of noise levels of various types of construction equipment when measured at 50 ft distance from the equipment. Typical levels of exterior noise from construction activity (excluding pile driving activity) at various distances from the job site are shown in Figure 19. The impulsive noise levels of impact pile drivers are approximately 15 dBA higher than the levels shown in Figure 19, while the intermittent noise levels of vibratory pile drivers are at the upper end of the noise level ranges depicted in the figure.

Figure 19 is useful for predicting exterior noise levels at short distances (within 100 FT) from the work when visual line of sight exists between the construction equipment and the receptor. Direct line-of-sight distances from the construction equipment to existing residential, church, and school buildings could range from 150 FT to 2,000 FT, with corresponding average noise levels of 76 to 52 dBA (plus or minus 5 dBA). For receptors along a cross-street, the construction noise level vs. distance curve of Figure 19 should be reduced by approximately 8 dBA when the work is occurring at the intersection with the cross street, and should be reduced by 15 dBA when work is occurring at least 100 FT from the intersection (and the visual line-of-sight is blocked by intervening buildings). Typical levels of construction noise inside naturally ventilated and air conditioned structures are approximately 10 and 20 dB less, respectively, than the levels shown in Figure 19.
The existing residences along Salt Lake Boulevard are predicted to experience the highest noise levels during construction activities due to their closest proximity to the possible construction sites under the three phases of Option B. Noise from construction is not expected to adversely affect public health and welfare due to the temporary nature of the work, the relatively high background noise levels at the closest residences which front major roadways, and due to the administrative controls available for regulation of construction noise. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the project site. Mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise sources (70 to 80+ dB at 150 FT distance), and due to the exterior nature of the work (grading and earth moving, trenching, concrete pouring, hammering, etc.). The use of properly muffled construction equipment should be required on the job site.

The incorporation of State Department of Health construction noise limits and curfew times, which are applicable throughout the State of Hawaii (Reference 4), is another noise mitigation measure which is normally applied to construction activities. Figure 20 depicts the normally permitted hours of construction. Noisy construction activities are not allowed on Sundays and holidays, during the early morning, and during the late evening and nighttime periods under the DOH permit procedures.
APPENDIX A. REFERENCES

(1) "Guidelines for Considering Noise in Land Use Planning and Control;" Federal Interagency Committee on Urban Noise; June 1980.


(3) "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety;" Environmental Protection Agency (EPA 550/9-74-004); March 1974.

(4) "Title 11, Administrative Rules, Chapter 46, Community Noise Control;" Hawaii State Department of Health; September 23, 1996.


(7) 24-Hour Traffic Counts At Station B720009902154, Kamehameha Highway Between Salt Lake Boulevard and Ford Island Boulevard; Hawaii State Department of Transportation, Highways Division; April 24, 2018.

(8) 24-Hour Traffic Counts At Station B727241000027, Kahuapaani Street Between Mamami Place and Ali Street Ramps; Hawaii State Department of Transportation, Highways Division; June 5, 2018.
APPENDIX B

EXCERPTS FROM EPA'S ACOUSTIC TERMINOLOGY GUIDE

Descriptor Symbol Usage

The recommended symbols for the commonly used acoustic descriptors based on A-weighting are contained in Table I. As most acoustic criteria and standards used by EPA are derived from the A-weighted sound level, almost all descriptor symbol usage guidance is contained in Table I.

Since acoustic nomenclature includes weighting networks other than "A" and measurements other than pressure, an expansion of Table I was developed (Table II). The group adopted the ANSI descriptor-symbol scheme which is structured into three stages. The first stage indicates that the descriptor is a level (i.e., based upon the logarithm of a ratio). The second stage indicates the type of quantity (power, pressure, or sound exposure), and the third stage indicates the weighting network (A, B, C, D, E, etc.).

If no weighting network is specified, "A" weighting is understood. Exceptions are the A-weighted sound level and the A-weighted peak sound level which require that the "A" be specified. For convenience in those situations in which an A-weighted descriptor is being compared to that of another weighting, the alternative columns in Table II parallel the inclusion of the "A". For example, a report on blast noise might wish to contrast the LdnL with the Ldn.

Although not included in the notes, it is also recommended that "L" and "d" be used as symbols for perceived noise levels and effective perceived noise levels, respectively.

It is recommended that in their initial use within a report, such terms be written in full, rather than abbreviated. An example of preferred usage is as follows:

The A-weighted sound level (Ldn) was measured before and after the installation of a new treatment.

The measured Ldn values were 65 and 75 dB, respectively.

Descriptor Nomenclature

With regard to energy averaging over time, the term "average" should be discouraged in favor of the term "equivalent." Hence, Leq is designated the "equivalent sound level." For Ld, Ln, and Ldn, "equivalent" need not be stated since the concept of day, night, or day-night averaging is by definition understood. Therefore, the designations are "day sound level," "night sound level," and "day-night sound level," respectively.

The peak sound level is the logarithmic ratio of peak sound pressure to a reference pressure and not the maximum root mean square pressure. While the latter is the maximum sound pressure level, it is often incorrectly labelled peak. In that sound level meters have "peak" settings, this distinction is most important.

"Background ambient" should be used in lieu of "background," "ambient," "residual," or "indigenous" to describe the levels characteristic of the general background noise due to the contribution of many unidentified noise sources near and far.

With regard to units, it is recommended that the unit decibel (abbreviated dB) be used without modification. Hence, dBA, dPN, and dPNd are not to be used. Examples of this preferred usage are: the Perceived Noise Level (Ldn found to be 75 dB, Ldn = 75 dB). This decision was based upon the recommendation of the National Bureau of Standards, and the policies of ANSI and the Acoustical Society of America, all of which disallow any modification of dB except for prefixes indicating its multiples or subdivisions (e.g., dBA).

Noise Impact

In discussing noise impact, it is recommended that "level weighted Population" (LWP) replace "Equivalent Noise Level Impact" (ENLI). The term "Relative Change of Impact" (RCI) shall be used for comparing the relative differences in LWP between the alternatives.

Further, when appropriate, "Noise Impact Index" (NII) and "Population Weighted Loss of Hearing" (PWL) shall be used consistent with DMA Working Group 69 Report Guidelines for Preparing Air/Environmental Impact Statements (1977).

APPENDIX B (CONTINUED)

TABLE I

A-WEIGHTED RECOMMENDED DESCRIPTOR LIST

<table>
<thead>
<tr>
<th>TERM</th>
<th>SYMBOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A-Weighted Sound Level</td>
<td>L_A</td>
</tr>
<tr>
<td>2. A-Weighted Sound Power Level</td>
<td>L_WA</td>
</tr>
<tr>
<td>3. Maximum A-Weighted Sound Level</td>
<td>L_max</td>
</tr>
<tr>
<td>4. Peak A-Weighted Sound Level</td>
<td>L_Apk</td>
</tr>
<tr>
<td>5. Level Exceeded x% of the Time</td>
<td>L_eq</td>
</tr>
<tr>
<td>6. Equivalent Sound Level</td>
<td>L_eq(T)</td>
</tr>
<tr>
<td>7. Equivalent Sound Level over Time (T) (1)</td>
<td>L_eq(T)</td>
</tr>
<tr>
<td>8. Day Sound Level</td>
<td>L_d</td>
</tr>
<tr>
<td>9. Night Sound Level</td>
<td>L_n</td>
</tr>
<tr>
<td>10. Day-Night Sound Level</td>
<td>L_dn</td>
</tr>
<tr>
<td>11. Yearly Day-Night Sound Level</td>
<td>L_dn(Y)</td>
</tr>
<tr>
<td>12. Sound Exposure Level</td>
<td>L_SE</td>
</tr>
</tbody>
</table>

(1) Unless otherwise specified, time is in hours (e.g., the hourly equivalent level is Leq[1]). Time may be specified in non-quantitative terms (e.g., could be specified a Leq(VASH) to mean the washing cycle noise for a washing machine).

SOURCE: EPA ACOUSTIC TERMINOLOGY GUIDE, BNA A-14-75.
### APPENDIX B (CONTINUED)

#### TABLE II

**RECOMMENDED DESCRIPTOR LIST**

<table>
<thead>
<tr>
<th>TERM</th>
<th>A-WEIGHTING</th>
<th>OTHER(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sound (Pressure) Level</td>
<td>$L_A$</td>
<td>$L_pA$</td>
</tr>
<tr>
<td>2. Sound Power Level</td>
<td>$L_{WA}$</td>
<td>$L_{W}$</td>
</tr>
<tr>
<td>3. Max. Sound Level</td>
<td>$L_{max}$</td>
<td>$L_{V_{max}}$</td>
</tr>
<tr>
<td>4. Peak Sound (Pressure) Level</td>
<td>$L_{Apk}$</td>
<td>$L_{Bpk}$</td>
</tr>
<tr>
<td>5. Level Exceeded x% of the Time</td>
<td>$L_x$</td>
<td>$L_{Ax}$</td>
</tr>
<tr>
<td>6. Equivalent Sound Level</td>
<td>$L_{eq}$</td>
<td>$L_{Aeq}$</td>
</tr>
<tr>
<td>7. Equivalent Sound Level Over Time(T)</td>
<td>$L_{eq(T)}$</td>
<td>$L_{Aeq(T)}$</td>
</tr>
<tr>
<td>8. Day Sound Level</td>
<td>$L_d$</td>
<td>$L_{Ad}$</td>
</tr>
<tr>
<td>9. Night Sound Level</td>
<td>$L_n$</td>
<td>$L_{An}$</td>
</tr>
<tr>
<td>10. Day-Night Sound Level</td>
<td>$L_{dn}$</td>
<td>$L_{Adn}$</td>
</tr>
<tr>
<td>11. Yearly Day-Night Sound Level</td>
<td>$L_{dn(Y)}$</td>
<td>$L_{Adn(Y)}$</td>
</tr>
<tr>
<td>12. Sound Exposure Level</td>
<td>$L_s$</td>
<td>$L_{SA}$</td>
</tr>
<tr>
<td>13. Energy Average Value Over (Non-Time Domain) Observations</td>
<td>$L_{eq(e)}$</td>
<td>$L_{Aeq(e)}$</td>
</tr>
<tr>
<td>14. Level Exceeded x% of the Total Set of (Non-Time Domain) Observations</td>
<td>$L_{x(e)}$</td>
<td>$L_{Ax(e)}$</td>
</tr>
<tr>
<td>15. Average $L_x$ Value</td>
<td>$L_x$</td>
<td>$L_{Ax}$</td>
</tr>
</tbody>
</table>

(1) "Alternative" symbols may be used to assure clarity or consistency.

(2) Only B-weighting shown. Applies also to C,D,E,F-G weighting.

(3) The term "pressure" is used only for the unweighted level.

(4) Unless otherwise specified, time is in hours (e.g., the hourly equivalent level is $L_{eq(1)}$). Time may be specified in non-quantitative terms (e.g., could be specified as $L_{eq(WASH)}$) to mean the washing cycle noise for a washing machine.

---

### APPENDIX C

**SUMMARY OF BASE YEAR AND YEAR 2025 TRAFFIC VOLUMES DURING AM AND PM PEAK HOURS**

<table>
<thead>
<tr>
<th>ROADWAY LAKES</th>
<th>AM PM</th>
<th>AM PM</th>
</tr>
</thead>
<tbody>
<tr>
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<td>750 760</td>
</tr>
<tr>
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<td>750 760</td>
</tr>
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<td>Done</td>
</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>Salt Lake Blvd, Between Kalakaua &amp; Stadium Dr. (NB)</td>
<td>750 760</td>
<td>750 760</td>
</tr>
<tr>
<td>Salt Lake Blvd, Between Kalakaua &amp; Stadium Dr. (SB)</td>
<td>750 760</td>
<td>750 760</td>
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</tr>
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<td>750 760</td>
<td>750 760</td>
</tr>
<tr>
<td>Salt Lake Blvd, Between Stadium Dr. &amp; Kamehameha (EB)</td>
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<td>Salt Lake Blvd, Between Stadium Dr. &amp; Ford Island (EB)</td>
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<td>750 760</td>
</tr>
<tr>
<td>Kamehameha Hwy. S. of Ford Island (SB)</td>
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<td>750 760</td>
</tr>
<tr>
<td>Two-Way</td>
<td>Done</td>
<td>Done</td>
</tr>
</tbody>
</table>

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**Page 48**

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**Page 49**
Appendix G:
Hazardous Material Survey
Limited Hazardous Materials Survey

New Aloha Stadium Entertainment District
99-500 Salt Lake Boulevard
Honolulu, Hawaii

Prepared by:
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ENPRO Project Number: 2001-00019-CSL
Date of Report: March 4, 2020
On-Site Investigation: January 15, 16, 17, 20, 21, & 23

Draft Report

Table of Contents

Section                                                                 Page
1.0 BACKGROUND .................................................................................1
  1.1 REGULATORY REQUIREMENTS FOR DEMOLITION/RENOVATION ..........1
  1.2 TASKS ..........................................................................................4
  1.3 LIMITATIONS ..............................................................................4
  1.4 RESULTS OF PREVIOUS INVESTIGATIONS .....................................5
2.0 PROPERTY DESCRIPTION ......................................................................9
  2.1 GENERAL ...................................................................................9
  2.2 BUILDING MATERIALS ...............................................................9
3.0 OBSERVATIONS AND MATERIALS INVENTORY ................................11
  3.1 PCB ..........................................................................................11
  3.2 MERCURY ................................................................................12
  3.3 STORED HAZARDOUS MATERIALS ............................................12
  3.4 CANEC .....................................................................................13
  3.5 ASBESTOS-CONTAINING MATERIALS .........................................13
  3.6 LEAD IN PAINT ..........................................................................16
4.0 CONCLUSIONS AND RECOMMENDATIONS ...................................17
  4.1 ASBESTOS-CONTAINING MATERIALS .........................................17
  4.2 LEAD IN PAINT ..........................................................................17
  4.3 PCB / LIGHT BALLASTS ............................................................18
  4.4 MERCURY ................................................................................18
  4.5 HAZARDOUS MATERIALS .......................................................19
5.0 CERTIFICATIONS .............................................................................20
6.0 APPENDICES ................................................................................21
1.0 BACKGROUND

ENPRO Environmental (ENPRO) was retained by Crawford Architects to perform an inventory assessment of hazardous materials at the New Aloha Stadium Entertainment District, located at 99-500 Salt Lake Boulevard, Honolulu Hawaii. The purpose of this project was to:

- visually assess the presence of readily accessible and identifiable hazardous materials;
- review regulatory files, historical documentation of the property, and environmental reports as made available to ENPRO; and
- provide a hazardous materials survey report to be included in the Environmental Impact Statement (EIS) for the project.

Hazardous materials included:
- Polychlorinated biphenyls (PCBs) containing ballasts/transformers,
- mercury-containing lamps,
- stored chemicals,
- asbestos-containing material (ACM), and
- lead-containing paints

1.1 REGULATORY REQUIREMENTS FOR DEMOLITION/RENOVATION

Mercury

All fluorescent light tubes are considered to be mercury-containing lamps. When mercury-containing lamps are taken out of service and intended to be discarded, they become regulated Universal Waste.

A small quantity handler of universal waste must manage lamps in a way that prevents releases of any universal waste or component of a universal waste to the environment, as follows:

1. A small quantity handler of universal waste must contain any lamp in containers or packages that are structurally sound, adequate to prevent breakage, and compatible with the contents of the lamps. Such containers and packages must remain closed and must lack evidence of leakage, spillage or damage that could cause leakage under reasonably foreseeable conditions.

(2) A small quantity handler of universal waste must immediately clean up and place in a container any lamp that is broken and must place in a container any lamp that shows evidence of breakage, leakage, or damage that could cause the release of mercury or other hazardous constituents to the environment. Containers must be closed, structurally sound, compatible with the contents of the lamps and must lack evidence of leakage, spillage or damage that could cause leakage or releases of mercury or other hazardous constituents to the environment under reasonably foreseeable conditions.

Fluorescent Light Ballasts (FLB)

PCBs were commonly used in the small capacitor within fluorescent light ballasts. Ballasts manufactured through 1979 may contain PCBs.

PCB-containing ballasts become a concern if they are leaking or they will be removed and disposed of as hazardous waste. According to the Environmental Protection Agency (EPA) Toxic Substances Control Act (TSCA) regulations, the material must be incinerated. The entire lighting fixture does not need special handling and disposal as long as the ballast (electrical box) is not leaking. The non-leaking ballasts can be removed and recycled or disposed of properly.

Leaking PCB ballasts require special handling and disposal. All other ballasts meet the definition of a non-regulated Small Capacitor and therefore do not have specialized disposal requirements.

PCB ballasts are found in the housing of fluorescent, mercury vapor, and high intensity discharge lighting that were manufactured prior to 1980. Over the years, old fixtures have been decommissioned during demolition, renovation, general maintenance projects, and energy-saving lighting installations. When ballasts are put out of service, they become subject to Federal and State waste regulations. The primary law regulating PCBs is the Toxic Substances Control Act (TSCA).

TSCA regulates the manufacture, sale, use, and disposal of certain chemical substances, and requires testing, tracking, pre-screening, and record keeping of chemical products. TSCA also regulates the disposal of PCBs. In specific situations, ballasts are exempt from TSCA requirements. For instance, TSCA does not regulate the disposal of non-leaking, Small Capacitors. A fluorescent lamp ballast is classified as a Small Capacitor if it contains less than 3 pounds of dielectric fluid and/or has a total volume of less than 100 cubic inches. A lighting ballast is also considered a Small Capacitor if it has a volume between 100 and 200 cubic inches and has a total weight of less than nine pounds. Small Capacitors are subject to TSCA under two conditions:

- If the Small Capacitor is leaking PCBs, it is regulated as a PCB Article, as defined in 40 CFR 761.3 of the federal PCB regulations. PCB Articles with concentrations at 500 parts per million (ppm) or greater must be disposed of in an incinerator complying with 40 CFR 761.70, or in a chemical waste landfill complying with 40 CFR 761.75. PCB
Articles disposed at a chemical waste landfill must be drained of all free-flowing PCBs and the drained PCBs greater than 500 ppm must be disposed of by incineration meeting the specifications in 40 CFR 761.70.

- In the second condition, Small Capacitors (intact or leaking) owned by any person who manufactures or at any time manufactured PCB-containing capacitors or PCB-containing equipment defined in 40 CFR 761.60(b)(2)(iv), must ensure delivery of the PCB-containing capacitor to a TSCA-permitted incinerator for disposal. PCB-containing ballasts also may be subject to regulation under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLA has many features including establishing reportable levels for certain substances and a notification requirement for release of these substances. PCBs are a hazardous substance under CERCLA reportable quantity requirements and releases exceeding one pound during a 24-hour period must be reported to the National Response Center (NRC), as specified in Section 102 (a) of CERCLA. For information on reporting requirements, contact NRC at 1-800-424-8802.

Asbestos

The removal of regulated asbestos containing material (RACM) is required prior to demolition for all RACM that exceeds the threshold limits as defined in the regulations, National Emission Standards for Hazardous Air Pollutants (NESHAP).

Notification to the State of Hawaii, Department of Health is required for all demolition projects in Hawaii. Requirements for NESHAP RACM occur when a cumulative threshold limit of 160 square feet, 260 linear feet of pipe insulation and/or 35 cubic feet is exceeded.

Lead Containing Paints

During demolition, the Occupational Safety and Health Administration (OSHA) regulations apply to abatement workers. Additionally, demolition debris shall need to be sampled and tested (using toxicity characteristic leaching procedure [TCLP] analytical procedures) to determine if the waste is acceptable as municipal waste or regulated hazardous waste.

OSHA also requires lead awareness training for all workers who may be exposed to airborne lead concentrations above the OSHA Action Level (AL) of thirty micrograms per cubic meter (30 µg/m³) for an 8-hour time-weighted average (TWA).

Arsenic in Canec

OSHA regulations apply to worker protection during renovation and demolition activities. At a minimum OSHA requires arsenic awareness training for all workers who may be exposed to airborne arsenic concentrations above the OSHA AL of 5 µg/m³ for an 8-hour TWA.

The on-island landfill does not regulate the disposal of canec fiberboard materials which may contain arsenic. In accordance with 40 CFR 261 and HAR 11-261-4(b)(9), wood and wood products with arsenic are exempt from hazardous waste disposal regulations. Prior to canec removal, the contractor should contact a landfill licensed to accept construction and demolition material solid waste and inquire if a profile (Toxicity Characteristic Leaching Procedure) of the canec waste is required as a prerequisite for disposal.

Stored Hazardous Materials

All stored hazardous materials should be properly identified, labeled, containerized, transported, recycled or disposed. If stored without spill-prevention containment, the underlying substrate may need to be sampled and analyzed for contaminants of concern.

1.2 TASKS

The tasks of performing the hazardous materials investigation and assessment included:

1) Investigation of accessible areas of the project site for PCB-containing ballasts and mercury-containing lamps
2) Inventory and documentation of stored chemicals located on site
3) Inventory of canec building materials
4) Identification of suspect ACM
5) Evaluation of the different applications of paint
6) Review of previous hazardous materials reports
7) Preparation of a report presenting findings

1.3 LIMITATIONS

Only readily accessible areas were inspected. Excluded from detailed observation were the following areas:

- Roofs of all building structures
- Escalator
- Construction trailer on Tax Map Key (TMK) (1) 9-9-003: 055

ENPRO has relied upon the Client or the Client’s representative for access and assumes no liability for areas not identified by the Client or the Client’s representatives. ENPRO is not responsible for inspecting, assessing or otherwise consulting with respect to hidden or inaccessible materials. Areas that may not be sampled are behind walls, above ceilings, inside

Hazardous Materials Survey
Project Number 2001-00019-CSL
Aloha Stadium, 99-500 Salt Lake Boulevard
Honolulu, Hawaii
utility conduits, ventilation ducts, and exterior roofing. This investigation is limited to the structures and aboveground portions of the subject property only.

Suspect materials not sampled and analyzed due to limitations or inaccessibility which shall be disturbed during demolition/renovation activities must be sampled and analyzed for asbestos, or assumed to be ACM. Suspect ACM which may be encountered during demolition includes, but is not limited to:

- Thermal system insulation (TSI)
- Surfacing materials including skim coat, paint, texture
- Drywall, tape, and joint compound
- Floor coverings, mastic
- Roofing materials
- Patching materials
- Grout
- Window glaze
- Sealants
- Concrete fillers
- Transite-like materials
- Wallboard
- Ceiling panels

This report should be considered in conjunction with any previous hazardous materials investigation reports completed for the project site. This survey report is not a project specification. All quantities are estimates. ENPRO recommends that prior to demolition, responsible parties:

- confirm the types and quantities of hazardous materials on the site;
- retain a certified Project Designer to prepare project specifications and work plans to address the removal of hazardous materials

### 1.4 RESULTS OF PREVIOUS INVESTIGATIONS

ENPRO reviewed a previous hazardous materials survey prepared by Masa Fujioka & Associates dated January 18, 2010. The report revealed that no asbestos was found in the limited amounts of suspect ACM that were sampled during their investigation.

Lead-based paint was reported in the following areas:

- Red concrete floor, north stands upper Section UU
- Yellow concrete floor, north stands upper Section UU
- Red metal seats, north stands upper Section UU
- Orange concrete floor, north stands lower Section TT
- Orange metal seats, north stands lower Section TT
- Brown concrete block, north lower at girder base

Lead-containing paint was reported to be present on fourteen other surfaces in the Aloha Stadium Arena Area.

Soil samples collected and analyzed for Total Petroleum Hydrocarbon (TPH) as oil were reported to contain TPH at concentrations above the Department of Health (DOH) Tier 1 Environmental Action Levels (EALs). However, samples were collected directly from a stained patched area of approximately six to seven square feet within the mauka-north wedge area, and was not a representative sample of soils outside of the stained patch.

Masa Fujioka & Associates also reviewed four other hazardous materials surveys:

1. **Asbestos Containing Materials Survey Report for the Aloha Stadium**, prepared by EMET Services Inc. dated June 30, 1992. The report documented asbestos found in the form of transite wallboard in several areas within the Aloha Stadium Arena, including:
   - Sound/mechanical room, yellow Section AA (approximately 101 ft²)
   - Women’s restroom, yellow Section GG (approximately 568 ft²)
   - Men’s restroom, yellow Section GG (approximately 644 ft²)
   - Mechanical room 513, yellow Section FF (approximately 64 ft²)
   - Room 514, yellow Section DD (approximately 514 ft²)
   - Baseball Press Box, loge Section A & AA (approximately 4,953 ft²)
   - First Aid Room, blue Section AA (approximately 1,559 ft²)
   - Mechanical room, blue Section BB (approximately 336 ft²)
   - Electrical room 102, blue Section B (approximately 1,197 ft²)
   - Concessionaire, blue Section JJ (approximately 210 ft²)
   - Escalator, blue Section JJ (approximately 2,000 ft²)

   - Gypsum wallboard throughout the office areas (approximately 9,000 ft²)
   - White and brown floor tile and associated black mastic in the Main Office (approximately 170 ft²)
   - Brown floor tile and associated black mastic in the Ticket Box Office (approximately 780 ft²)
• Tan floor tile and associated black mastic in the Ticket Box Office (approximately 1,125 ft²)
• Black door sealant/caulking of the Main Office Storage Room (approximately 18 ft)


• Joint compound associated with gypsum wallboard throughout the office areas (approximately 1,125 ft²)
• Black mastic associated with white with brown streaks vinyl floor tile in the Main Office (approximately 170 ft²)
• Black mastic associated with brown vinyl floor tile in the Ticket Box Office (approximately 780 ft²)
• Black mastic associated with tan vinyl floor tile in the Ticket Box Office (approximately 1,125 ft²)
• White caulking associated with the door frame of the Main Office Storage Room (approximately 18 ft)

The following lead-based paints were identified:

• Orange paint over gray primer on concrete stairs on Section S
• Blue paint over brown paint on metal wall of Gate Q


• Black non-skid coating on the concrete walkway fronting the main concession (approximately 300 ft²)
• Cementitious paneling (transite) in the kitchen area of the main concession (approximately 1,800 ft²)
• Black tar sealant over fibrous cloth at electrical conduit penetrations through the concrete floor in the kitchen of the main concession (approximately 5 ft²)
• Gray sink undercoating located on two sinks with eyewash spouts in the kitchen area of the main concession (approximately 6 ft²)
• Black counter undercoating located on the dishwashing sink and the heating rack in the kitchen area of the main concession (approximately 16 ft²)
• Black filler/sealant surrounding floor sinks and plumbing penetrations through the concrete floor in the kitchen area of the main concession. (approximately 10 ft)
• White door caulking associated with the west doorway leading to the kitchen area of the main concession (approximately 25 ft²)

• Gray filler/sealant surrounding pipe penetrations through the concrete floor in the mechanical room, Room 325 (approximately 4 ft)
2.0 PROPERTY DESCRIPTION

2.1 GENERAL

The project site was located in Honolulu, on the south side of the island of Oahu.

The project site consisted of four parcels used for commercial/industrial use.

The property is operated by the State of Hawaii, Aloha Stadium Authority and Transit Rail Station.

The project site was a total of 99 acres, including the following TMKs:

- (1) 9-9-003: 061
- (1) 9-9-003: 071
- (1) 9-9-003: 070
- (1) 9-9-003: 055

On-site structures included the following:

- Aloha Stadium Arena
- Aloha Stadium Main Office Building
- North and South Main Concession Stand Areas
- Ticket Booth Sheds
- Outdoor Bathroom Structures
- General Services Warehouse
- Parking Lot Warehouse
- Rail Transit Station
- Construction trailer

2.2 BUILDING MATERIALS

The structures at the project site were generally composed of:

- concrete, concrete masonry unit (CMU), metal, and plaster exterior walls,
- concrete, CMU, metal, drywall, hard board, wood, and plaster interior walls, and
- flat, tar or corrugated metal roofing materials

On-site structures and their building material composition are listed below:

- Aloha Stadium Arena: concrete, CMU, metal, plaster, floor tile, wall tile, hard board, and drywall
- Aloha Stadium Main Office Building: concrete, CMU, metal, plaster, floor tile, wall tile, hard board, and drywall
- North and South Main Concession Stand Areas: concrete, CMU, metal, plaster, floor tile, wall tile, and drywall
- Ticket Booth Sheds: concrete, brick, floor tile, hardboards, drywall, and glass
- Outdoor Bathroom Structures: concrete, CMU, metal, floor tile, wall tile, hard board, and drywall
- General Services Warehouse: concrete, CMU, and metal
- Parking Lot Warehouse: concrete, CMU, and metal
- Rail Transit Station: concrete, CMU, metal, floor tile, wall tile, and drywall (under construction at the time of ENPRO’s site visit)
- Construction Trailer: concrete and metal (portable inaccessible trailer)
3.0 OBSERVATIONS AND MATERIALS INVENTORY

3.1 PCB

Fluorescent Light Ballasts

A total of approximately 3,000 fluorescent light fixtures were observed on the project site. All ballasts associated with these fixtures are assumed to contain PCBs unless there is a “No-PCB” label present.

All light ballasts observed on the project site meet the definition of a non-regulated Small Capacitor and therefore not regulated per disposal requirements, presuming they are not leaking.

Hydraulic Lift Equipment

Visual observation for hydraulic lift equipment or components containing hydraulic fluid that potentially contains PCBs was conducted. There was evidence of hydraulic lift equipment associated with the elevator on the north end of the Aloha Stadium.

Electrical Transformers

One pad-mounted/vaulted transformer (Vault Number 2666A, Transformer Number 86594), owned by Hawaiian Electric Company (HECO), was observed on the adjacent property southwest the Project Site located on 99-560 Salt Lake Boulevard. No evidence of leakage on the outside of the vaulted transformer was noted.

An inquiry was sent to HECO regarding the PCB content of the pad-mounted/vaulted transformer and any other pad-mounted/vaulted and/or pole-mounted transformers that were located on and/or in the near vicinity of the Aloha Stadium that may have been hidden from view during ENPRO’s site investigation. HECO responded to the inquiry and indicated the transformers were “non-PCB” or “PCB-free.”

Since the transformers are owned and operated by HECO, HECO is responsible for remediating any environmental impacts they might cause. Details regarding correspondence with HECO can be found in the appendix section of this report.

Seven vaulted electrical equipment (suspect electrical transformers), privately-owned by the Aloha Stadium Authority, were observed on the project site. Evidence of minimal leakage/corrosion was noted. Assessment for the presence of PCBs within the dielectric fluid (if any) inside the transformers is necessary.

3.2 MERCURY

Fluorescent Light Tubes

Approximately 3,000 fluorescent light fixtures were observed on the project site. All fluorescent light tubes (lamps) associated with these fixtures are considered to be mercury-containing.

3.3 STORED HAZARDOUS MATERIALS

The following stored hazardous materials were observed:

- Limited amounts of household cleaning products
- Approximately ten, 5-gallon buckets of White Lava Deck Coating
- Approximately fifteen, 5-gallon buckets of asphaltic patching materials
- Approximately four, 55-gallon buckets of waste oil/transmission fluid
- Approximately three, 55-gallon drums and two 5-gallon buckets of hydraulic fluid
- Approximately three, 55-gallon drums motor oil
- Approximately three-hundred, 55-gallon drums of various contents including:
  - automatic transmission fluid,
  - super duty diesel motor oil,
  - heavy duty coolant/antifreeze ethylene glycol base,
  - waste oil,
  - empty drums used for trash,
  - unlabeled drums with unknown contents, etc.
- Approximately one-hundred used tires
- Approximately one-hundred fifty, 5-gallon buckets of old paints/part B paint hardener mixture
- One, 500-gallon, diesel fuel above ground storage tank (AST) (vault construction)
- One, 500-gallon, gasoline AST (vault construction)
- Two, 250-gallon, propane ASTs
- Two, 120-gallon, propane ASTs
• Approximately twenty-five, 5-gallon propane tanks

Materials were identified by labels and escorts.

3.4 CANEC

No canec building material was identified.

3.5 ASBESTOS-CONTAINING MATERIALS

Table 1 presents the results of the suspect asbestos visual inventory. The table includes the location, the suspect asbestos containing material, and the estimated quantity of each material. Specific location identities were not part of the project scope. Generally, the materials were in damaged to significantly damaged condition.

Table 1: Asbestos Locations and Estimated Quantities

<table>
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<tr>
<th>LOCATION</th>
<th>MATERIAL</th>
<th>ESTIMATED QUANTITY</th>
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<tr>
<td>Aloha Stadium Arena</td>
<td>Ceiling Drywall</td>
<td>1,856 ft²</td>
</tr>
<tr>
<td></td>
<td>Ceiling Fire Proof Surfacing Material</td>
<td>1,522 ft²</td>
</tr>
<tr>
<td></td>
<td>Hard Board</td>
<td>5,915 ft²</td>
</tr>
<tr>
<td></td>
<td>Wall Drywall</td>
<td>4,841 ft²</td>
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<tr>
<td></td>
<td>Beige Vinyl Floor Tile</td>
<td>1,108 ft²</td>
</tr>
<tr>
<td></td>
<td>Gray Cove Base</td>
<td>340 ft²</td>
</tr>
<tr>
<td></td>
<td>Drop Ceiling Tiles</td>
<td>2,350 ft²</td>
</tr>
<tr>
<td></td>
<td>Acoustic Insulation Paneling</td>
<td>64 ft²</td>
</tr>
<tr>
<td></td>
<td>Sink Undercoat</td>
<td>18 ft²</td>
</tr>
<tr>
<td></td>
<td>CMU</td>
<td>42,795 ft²</td>
</tr>
<tr>
<td></td>
<td>Concrete</td>
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</tr>
<tr>
<td></td>
<td>Non-Skid Coating</td>
<td>502,838 ft²</td>
</tr>
<tr>
<td></td>
<td>AstroTurf Glue</td>
<td>3,146 ft²</td>
</tr>
<tr>
<td></td>
<td>Sink/Toilet Caulking</td>
<td>206 ft</td>
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<td>HVAC Insulation</td>
<td>600 ft²</td>
</tr>
<tr>
<td></td>
<td>Linoleum</td>
<td>660 ft²</td>
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Table 1 (continued): Asbestos Locations and Estimated Quantities

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<th>LOCATION</th>
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<tr>
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<td>2&quot; Pipe Wrap</td>
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</tr>
<tr>
<td></td>
<td>4&quot; Pipe Wrap</td>
<td>390 ft</td>
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<td></td>
<td>6&quot; Pipe Wrap</td>
<td>30 ft</td>
</tr>
<tr>
<td></td>
<td>8&quot; Pipe Wrap</td>
<td>40 ft</td>
</tr>
<tr>
<td></td>
<td>10&quot; Pipe Wrap</td>
<td>80 ft</td>
</tr>
<tr>
<td></td>
<td>Window Caulking</td>
<td>100 ft</td>
</tr>
<tr>
<td></td>
<td>Countertop with Mastic</td>
<td>686 ft²</td>
</tr>
<tr>
<td></td>
<td>HVAC Caulking</td>
<td>10 ft</td>
</tr>
<tr>
<td></td>
<td>Green/White Wall Paneling with Mastic</td>
<td>3,300 ft²</td>
</tr>
<tr>
<td></td>
<td>Red Ceramic Floor Tile (9&quot;x9&quot;)</td>
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</tr>
<tr>
<td></td>
<td>Gray/Red Non-Skid Floor</td>
<td>7,200 ft²</td>
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<td>White Ceramic Wall Tile</td>
<td>2,100 ft²</td>
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<td>Wooden Wall Board with Mastic</td>
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<td>Cream Vinyl Floor Tile with Mastic</td>
<td>779 ft²</td>
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<td>Gray Vinyl Floor Tile with Mastic</td>
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<td>Fiberglass Reinforced Panels</td>
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<td>Green Carpet with Mastic</td>
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<td>Dark Gray Cove Base with Mastic</td>
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<td>Red Brick with Grout</td>
<td>2,470 ft²</td>
</tr>
<tr>
<td></td>
<td>Freezer Caulking</td>
<td>20 ft</td>
</tr>
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<td></td>
<td>Wooden Paneling with Mastic</td>
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<td>Brown Cove Base with Mastic</td>
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<table>
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<tr>
<th>LOCATION</th>
<th>MATERIAL</th>
<th>ESTIMATED QUANTITY</th>
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<tbody>
<tr>
<td>Aloha Stadium Main Office/Box Office Areas</td>
<td>Cream Vinyl Floor Tile with Mastic</td>
<td>440 ft²</td>
</tr>
<tr>
<td></td>
<td>Mixed Brown Ceramic Floor Tile with Grout</td>
<td>162 ft²</td>
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<td>White Vinyl Floor Tile with Mastic</td>
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<td>Light Blue Carpet with Mastic</td>
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<td>Gray Carpet with Mastic</td>
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<td></td>
<td>Gray Cove Base with Mastic</td>
<td>1,430 ft²</td>
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<td>Drop Ceiling Tiles</td>
<td>5,100 ft²</td>
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<td></td>
<td>Beige Ceramic Wall Tile with Grout</td>
<td>576 ft²</td>
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<td></td>
<td>Ceramic Wall Tile (Box Office) with Grout</td>
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<td>White Ceramic Wall Tile with Grout</td>
<td>1,648 ft²</td>
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<td>White Cove Base</td>
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<td>Sink/Toilet Caulking</td>
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<td>Wall Drywall</td>
<td>11,440 ft²</td>
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Table 1 (continued)
Asbestos Locations and Estimated Quantities

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<td>Linear Feet</td>
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<td>Aloha Stadium Main</td>
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<td>Office/Box Office Areas)</td>
<td>Beige Ceramic Floor Tile (9” x 9”) with Grout</td>
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<td>Plaster Ceiling</td>
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<td>Dark Gray Cove Base with Mastic</td>
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<td>2&quot; Pipe Wrap</td>
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<td>4&quot; Pipe Wrap</td>
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<td>6&quot; Pipe Wrap</td>
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<td>CMU</td>
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<td>Asphalt</td>
<td>3,438,533 ft²</td>
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Table 1 (continued)
Asbestos Locations and Estimated Quantities

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<td>Square Feet or</td>
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<td></td>
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<td>Linear Feet</td>
</tr>
<tr>
<td>Rail Transit Station</td>
<td>Concrete*</td>
<td>12,450 ft²</td>
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<tr>
<td>(this site was under construction</td>
<td>Asphalt*</td>
<td>267,120 ft²</td>
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<tr>
<td>at the time of ENPRO’s site visit-</td>
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<tr>
<td>full inventory of suspect asbestos</td>
<td>containing materials was incomplete</td>
<td></td>
</tr>
<tr>
<td>(conclusive)</td>
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*Note: Receipt of confirmation was received from the City and County of Honolulu that the Rail Transit Station contains no asbestos (see documentation in Appendices Section 6.0).

3.6 LEAD IN PAINT

A wide variety of different colored paints were observed on the Property. Multiple layers of paint may be present beneath paint surfaces. During the site reconnaissance, ENPRO was informed by the Aloha Stadium Authority personnel that the green painted exterior surfaces of the Aloha Stadium Arena were recently painted within the past ten years.

Due to the date of construction (lead in paint was regulated in 1977), all painted surfaces on the project site are considered to be lead-containing, unless sampling and analysis proves otherwise.
4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 ASBESTOS-CONTAINING MATERIALS

Prior to demolition, all suspect ACM must be sampled and analyzed for asbestos to determine if the building materials contain asbestos.

**Recommendation**

The NESHAP states that if asbestos is identified in amounts less than 10%, the owner or operator of the building must elect to assume the amount to be greater than 1% and treat the material as asbestos-containing material or request verification of the amount by point counting.

Prior to and during demolition and renovation, any fibrous or suspected asbestos-containing materials uncovered that were not analyzed, should be sampled and analyzed at a NVLAP accredited microscopy laboratory. The removal of regulated asbestos containing building material is required for all RACM that exceeds the threshold limits as defined in the regulations promulgated as the NESHAP. All RACM must be removed prior to routine demolition and renovation activities that will disturb the material, by a specialty licensed contractor (C-19) adhering to contract specifications developed and based on the results of the inspection and assessment, and EPA, OSHA, and State of Hawaii DOH regulations. Each owner or operator of a demolition or renovation activity shall provide the Department of Health with a separate written notification of intention to demolish or renovate at least 10 working days before the work is to begin, and update the notice as necessary.

4.2 LEAD IN PAINT

Due to the date of construction (lead in paint was regulated in 1977), all painted surfaces on the project site are considered to be lead-containing.

**Recommendation**

If lead paint is present, OSHA regulations apply to abatement workers. Additionally, demolition debris should be sampled and tested (per TCLP) to meet municipal disposal acceptance criteria.

---

4.3 PCB / LIGHT BALLASTS

A total of approximately 3,000 fluorescent light fixtures were observed on the project site. All ballasts associated with the light fixtures are assumed to contain PCBs unless there is a “No-PCB” label attached.

There was evidence of hydraulic lift equipment associated with the elevator on the north end of the Aloha Stadium.

One pad-mounted/vaulted transformer (Vault Number 2666A, Transformer Number 86594), owned by Hawaiian Electric Company (HECO), was observed on the adjacent property southwest the Project Site located on 99-560 Salt Lake Boulevard. No evidence of leakage on the outside of the vaulted transformer was noted and it was confirmed by HECO that the transformer was “PCB-free”.

Seven vaulted electrical equipment (suspect electrical transformers), privately-owned by the Aloha Stadium Authority, were observed on the project site. Evidence of minimal leakage and corrosion was noted.

**Recommendation**

During removal, identify polychlorinated biphenyl (PCB) vs. non-PCB ballasts per label identification. Leaking PCB ballasts require special handling and disposal. All other ballasts meet the definition of a non-regulated Small Capacitor and therefore do not have specialized disposal requirements.

If there is no documentation of PCB content available for review, ENPRO recommends sampling and analysis for PCBs of the hydraulic lift equipment associated with the elevator located on the north end of the Aloha Stadium. Determine PCB content of all hydraulic lift equipment on site prior to demolition.

ENPRO recommends all unlabeled/undocumented transformers be determined whether or not they contain PCBs via sampling and analysis methods. Determine PCB content of all transformers on site prior to demolition.

4.4 MERCURY

A total of approximately 3,000 mercury-containing fluorescent light fixtures were observed on the project site. All fluorescent light lamps associated with these fixtures are considered to be mercury-containing. The amount of mercury in a low-mercury bulb can range from 3.5 to 4 milligrams compared to a standard fluorescent bulb which ranges from 8 to 14 milligrams of mercury. These lamps may be identified by green end caps (often referred to as green-tipped lamps), or green etchings on the lamps.
Recommendation

When lamps are taken out of service and intended to be discarded, they must be disposed of as regulated universal waste. The EPA encourages the recycling of all mercury-containing lamps, regardless of the mercury content.

4.5 HAZARDOUS MATERIALS

Stored hazardous materials are listed in Section 3.3.

Recommendation

Prior to demolition, all stored hazardous materials shall be properly identified, labeled, containerized, transported, recycled or disposed of. In the interim, provide secondary containment, protection from storm water, maintenance of safety data sheets on-site, and adherence to hazard communication requirements for all quantities of hazardous materials on site.

5.0 CERTIFICATIONS

ENPRO Environmental (ENPRO) has completed a Hazardous Materials Survey for the New Aloha Stadium Entertainment District, located at 99-500 Salt Lake Boulevard, Honolulu, Hawaii (project site). The survey followed the methods and procedures consistent with good commercial or customary practice designed to conform to acceptable industry standards. This report is exclusively for the use and benefit of the Client identified on the title page of the report and is not for the use or benefit of, nor may it be relied upon by, any other person or entity. The contents of this report may not be quoted in whole or in part or distributed to any person or entity other than the Client hereof without, in each case, the written consent of the undersigned or the Client.

Investigated and Prepared By:
HIASB Certification Number:
L-RRP Certification Number:

Shea Monohara, Environmental Professional
4288
R-I-8861-3-17-00051

Investigated By:
HIASB Certification Number:
LBP-INS Certification Number:

Galen Ciszek, Environmental Professional
4214
PB-0974

Reviewed By:
HIASB Certification Number:
LBP-RA Certification Number:

Roberta Bitzer, Senior Environmental Professional
2783
PB-0224

Reviewed By:

Randy Herold, President
6.0 APPENDICES

Photographs

Figures

Letter Regarding Rail Transit Station

PHOTOGRAPHS
Photo 1
Aloha Stadium Arena

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23

Photo 2
Aloha Stadium Press Box Area (Exterior)

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23
Photo 11
Aloha Stadium Main Office Building

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23

Photo 12
Locker Room Areas in Main Administration Building

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23
Photo 13
Ticket Booth Structure

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23

Photo 14
Ticket Booth Interior

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23
Photo 15
Parking Lot Warehouse Area

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23

Photo 16
Hazardous Materials Stored on Site in Maintenance Areas of the Aloha Stadium

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23
**Photo 17**
Hazardous Materials Stored Outdoors Near East Boundary of the Aloha Stadium

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23

**Photo 18**
Paint/Part B Paint Mixture Being Disposed into the Drain in the North Tunnel Maintenance

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23
Photo 19
Paint/Part B Paint Mixture Being Disposed into the Drain in the North Tunnel Maintenance Area

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23

Photo 20
Green Propane Above Ground Storage Tank- North Concession Stand-Location of Overflow of Cooking Oil

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23
Photo 21
White Propane Aboveground Storage Tank and Portable Propane Tanks Near North Concession Stand

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23

Photo 22
Aboveground Storage Tanks Near South Concession Area

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23
**Photo 23**
One, 500-gallon Diesel Fuel AST and One, 500-gallon Gasoline AST Located on the North Boundary of the Aloha Stadium

- Project Number: 2001-00019-HAZ
- Aloha Stadium
- 99-500 Salt Lake Boulevard, Honolulu
- Date of Photos: January 15, 16, 17, 20, 21, & 23

**Photo 24**
Vaulted Transformer (V4266A, Non-PCB Containing) on Pump Station, Property Adjacent to the Southwest of the Project Site

- Project Number: 2001-00019-HAZ
- Aloha Stadium
- 99-500 Salt Lake Boulevard, Honolulu
- Date of Photos: January 15, 16, 17, 20, 21, & 23
**Photo 25**
Close-up View of Vaulted Transformer (V4266A, Non-PCB Containing) on Pump Station Property Adjacent to the Southwest of the Project Site

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23

**Photo 26**
One of Seven Privately Owned Electrical Equipment-Possible Transformer Equipment (Unknown PCB Content)

Project Number: 2001-00019-HAZ
Aloha Stadium
99-500 Salt Lake Boulevard, Honolulu
Date of Photos: January 15, 16, 17, 20, 21, & 23
FIGURES

**Figure 1**
AERIAL PHOTOGRAPH/SITE MAP

Scale: 1 inch = Approximately 200 feet

Location of Inappropriately Stored Solid Waste/Hazardous Materials on the East Boundary
Location of Inappropriately Stored Solid Waste/Hazardous Materials on the South Boundary

Project Number 2001-00019-CSL
Aloha Stadium
99-508 Salt Lake Boulevard
Honolulu, Hawaii 96818
Letter Regarding Rail Transit Station

KHSGC ALS Phase I Environmental Site Assessment (Asbestos-free Building)

Letter from Anil Verma Associates (Architect of Record)
DATE: Feb 28, 2020

As the station designer of the Aloha Stadium Station project we have followed all applicable codes and all federal laws that since 1977 have banned the use of Asbestos in building materials.

AVA can attest the Aloha Stadium Station approved contract documents have no materials that contain asbestos and that the newly constructed station buildings are designed to be Asbestos-free.

It should also be noted that since the entire site was demolished there are no original building remaining on the Aloha Stadium Station site.

In the Aloha Stadium Station drawings and specifications, the primary building materials used in constructing the station buildings is concrete, steel and concrete masonry block which are all Asbestos-free.

As are:
- Electrical and plumbing and mechanical systems are all Asbestos-free.
- Building finishes of paint, ceramic tile and simulated stone veneers are all Asbestos-free.
- Miscellaneous building materials used in the station like VCT flooring, cement board, Gyp Board, calking, waterproofing, sealants, metal and TPO Roofing are also all Asbestos-free.

As the architect for Aloha Stadium Station we can attest that there is no asbestos in any of the building materials designed and specified to be used in the construction of the new ALS transit rail station.

Respectfully

Joe Arias  |  Project Architect
Anil Verma Associates, Inc.
Appendix H:
Traffic Impact Assessment Report
TABLE OF CONTENTS

I. Introduction ................................................................. 1
   A. Purpose of Study ....................................................... 1
   B. Scope of Study ........................................................ 1

II. Project Description ..................................................... 1
    A. Location ............................................................... 1
    B. Project Characteristics .......................................... 3

III. Existing Traffic Conditions ......................................... 7
     A. Area Roadway System ............................................. 7
     B. Traffic Volumes and Conditions ................................ 13
        1. General ............................................................ 13
        a. Field Investigation ............................................ 13
        b. Capacity Analysis Methodology .............................. 14
        2. Existing Peak Hour Traffic .................................... 14
           a. General ........................................................... 14
           b. Kamehameha Highway, Honomanu Street, and
              McGrew Loop ..................................................... 17
           c. Kamehameha Highway and Salt Lake Boulevard (North) ......... 19
           d. Kamehameha Highway, Ford Island Bridge, and Salt Lake
              Boulevard (South) ............................................. 20
           e. Salt Lake Boulevard and Stadium Driveway .................. 21
           f. Salt Lake Boulevard and Kalaloa Street .................... 21
           g. Salt Lake Boulevard and Kahuapaani Street .............. 22
           h. Kahuapaani Street, Ala Ali Street, and Manana Place .... 23
           i. Kahuapaani Street and Ulane Street ...................... 25
           j. Moanalua Road and Aiea Access Road ...................... 26

IV. Projected Traffic Conditions ........................................ 27
    A. Site-Generated Traffic ............................................. 27
       1. Trip Generation Methodology .................................. 27
       2. Trip Distribution ................................................. 32
    B. Through-Traffic Forecasting Methodology ...................... 34
    C. Other Considerations .............................................. 34
    D. Total Traffic Volumes Without Project ......................... 34
    E. Total Traffic Volumes With Project ............................ 37

V. Traffic Impact Analysis .............................................. 39

VI. Multimodal Facilities .............................................. 41
    A. Pedestrian Facilities ............................................. 41
       1. Existing Conditions ........................................... 41
       2. Projected Conditions .......................................... 41
    B. Bicycle Facilities ............................................... 42
       1. Existing ........................................................... 42
       2. Bicycle Level of Service ...................................... 42
       3. Projected Conditions .......................................... 44
    C. Transit Facilities ................................................ 46
       1. Existing Conditions ........................................... 46
       2. Transit Capacity and Quality of Service Manual .......... 46
       3. Transit Level of Service ...................................... 49
       4. Projected Conditions .......................................... 50

VII. Recommendations .................................................. 51

VIII. Conclusion .......................................................... 53
LIST OF FIGURES

<table>
<thead>
<tr>
<th>FIGURE</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIGURE 1</td>
<td>Location Map and Vicinity Map</td>
</tr>
<tr>
<td>FIGURE 2</td>
<td>Overall Project Site Plan</td>
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<tr>
<td>FIGURE 3</td>
<td>Circulation Plan for Daily Use</td>
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<tr>
<td>FIGURE 4A</td>
<td>Circulation Plan for Stadium Special Events (Ingress)</td>
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<td>FIGURE 4B</td>
<td>Circulation Plan for Stadium Special Events (Egress)</td>
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<td>FIGURE 4C</td>
<td>Circulation Plan for Swap Meet</td>
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<td>FIGURE 5</td>
<td>Existing Lane Configurations</td>
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<tr>
<td>FIGURE 6</td>
<td>Existing Peak Hours of Traffic</td>
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<td>FIGURE 7</td>
<td>Distribution of Site-Generated Vehicles With Project</td>
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<td>FIGURE 8</td>
<td>Year 2026 Peak Hours of Traffic Without Project</td>
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<td>FIGURE 9</td>
<td>Year 2026 Peak Hours of Traffic With Project</td>
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<td>FIGURE 10</td>
<td>Existing and Proposed Pedestrian Facilities</td>
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<tr>
<td>FIGURE 11</td>
<td>Existing Bicycle Level of Traffic Stress</td>
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<td>FIGURE 12</td>
<td>Existing and Proposed Bicycle Facilities</td>
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<td>FIGURE 13</td>
<td>Transit Facilities Level of Service</td>
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LIST OF APPENDICES

<table>
<thead>
<tr>
<th>APPENDIX</th>
<th>Description</th>
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<tr>
<td>APPENDIX A</td>
<td>Existing Traffic Count Data</td>
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<td>APPENDIX B</td>
<td>Level of Service Definitions</td>
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<td>APPENDIX C</td>
<td>Capacity Analysis Calculations</td>
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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 first phase of the proposed redevelopment of the existing Aloha Stadium in Halawa on the island of Oahu. The project entails the replacement of the existing stadium with a new development referred to as the “New Aloha Stadium Entertainment District” (NASED) which entails a new stadium facility as well as other mixed-use developments including residential, commercial, and office uses.

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 existing Aloha Stadium is located adjacent to Kamehameha Highway in Halawa on the island of Oahu (see Figure 1). The project site is bounded by Kamehameha Highway to the west, the Interstate H-1 Freeway to the east, the Moanalua Freeway to the north, and Salt Lake Boulevard to the south. The project site is further identified as Tax Map Keys (TMKs): [1] 9-9-003 parcels 055, 061, 070, and 071. Access to the project site will be provided via driveways off Kamehameha Highway, Salt Lake Boulevard, and Kahuapauni Street.
B. Project Characteristics

The existing project site is comprised of four parcels that encompass approximately 98 acres. The parcel north of Salt Lake Boulevard currently houses the existing Aloha Stadium and surface parking areas while another parcel south of that roadway includes the future site of the Halawa Transit Station, which is currently under construction. The two remaining parcels are currently undeveloped. One of the parcels is located adjacent to Kamehameha Highway south of the future Halawa Rail Station while the other parcel is located adjacent to Salt Lake Boulevard and is currently being used as a construction staging area for the nearby Halawa Rail Station. Both parcels are expected to remain undeveloped with the proposed project. The existing Aloha Stadium was built in 1975 and has since served as one of the State’s premier entertaining and gathering venue. However, corrosion of the facility’s steel structure and the increasingly high maintenance and repair costs to retain the structure’s integrity has prompted the State of Hawaii and the Stadium Authority to pursue replacement of the aging facility and the redevelopment of the entire property. The proposed project is expected to include a new stadium facility as well as mixed-use developments that will house residential, commercial uses, and office uses. Collectively, the developments are referred to as the New Aloha Stadium Entertainment District (NASED) with the project expected to be implemented in three general phases over the next 10+ years. At this time, the details for Phases 2 and 3 are still being developed and as such, the analysis contained herein encompasses only the developments associated with Phase 1. Separate traffic assessments will be prepared for the remaining phases at a later time when more information is available. Phase 1 of the NASED entails the construction of the new stadium facility, as well as six other mix-used developments that will include residential, retail, restaurant, hotel, and office uses with completion expected by the Year 2026. Table 1 below summarizes the developments associated with Phase 1.
Table 1: New Aloha Stadium Entertainment District-Phase 1

<table>
<thead>
<tr>
<th>Area</th>
<th>Proposed Land Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>• 214 multifamily residential units</td>
</tr>
<tr>
<td>1.2</td>
<td>• 257 multifamily residential units</td>
</tr>
<tr>
<td></td>
<td>• 39,685 square feet (sf) retail uses</td>
</tr>
<tr>
<td>1.3</td>
<td>• 168 multifamily residential units</td>
</tr>
<tr>
<td></td>
<td>• 8,000 sf restaurant uses</td>
</tr>
<tr>
<td></td>
<td>• 24,450 sf retail uses</td>
</tr>
<tr>
<td></td>
<td>• 244 hotel rooms</td>
</tr>
<tr>
<td>1.4</td>
<td>• 35,000-seat arena</td>
</tr>
<tr>
<td>1.5</td>
<td>• 65 multifamily residential units</td>
</tr>
<tr>
<td></td>
<td>• 39,071 retail uses</td>
</tr>
<tr>
<td></td>
<td>• 45,425 sf general office uses</td>
</tr>
<tr>
<td>1.6</td>
<td>• 32 multifamily residential units</td>
</tr>
<tr>
<td></td>
<td>• 19,439 square feet (sf) retail uses</td>
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<tr>
<td></td>
<td>• 18,939 sf general office uses</td>
</tr>
<tr>
<td>1.7</td>
<td>• 20 multifamily residential units</td>
</tr>
<tr>
<td></td>
<td>• 13,300 sf restaurant uses</td>
</tr>
<tr>
<td></td>
<td>• 12,575 sf general office uses</td>
</tr>
</tbody>
</table>

Figure 2 shows the proposed site plan. Access to the project site is expected to be provided via driveways off Kamehameha Highway, Salt Lake Boulevard, and Kahuapani Street with parking for the mixed-use developments to be provided via designated parking structures within their respective areas. A loading/service area will be provided near the northwest corner of the project site for deliveries and passenger loading with access provided via a driveway off Kamehameha Highway. In addition, an area has been designated for ride share drop-off/pick-up within the project site east of the new stadium arena. Figure 3 depicts the expected daily vehicular circulation.

During special events, VIP parking will be provided within the parking garage of the future Halawa Rail Station while general parking will be provided via surface parking areas located east of the new stadium. Access to these parking areas will be provided via designated ingress/egress points with the exception of the Halawa Rail Station parking garage. An additional access off Kamehameha Highway will be
Traffic Impact Report for the New Aloha Stadium Entertainment District

provided to facilitate egress with modifications to the daily use circulation to be implemented during special events (see Figure 4A and 4B).

In addition, the project site will also continue to serve as the site for the existing Swap Meet which operates during off-peak periods on Wednesdays and weekends. The surface parking areas located east of the new stadium are expected to be used for both staging and parking for this function with entering and exiting traffic expected to be managed similar to existing operations (see Figure 4C).

III. EXISTING TRAFFIC CONDITIONS

A. Area Roadway System

In the vicinity of the project site, Kamehameha Highway is a predominantly five-lane, two-way urban arterial generally oriented in the east-west direction but transitions as a north-south roadway east of Aiea Access Road. West of the project site, Kamehameha Highway intersects Honomanu Street. At this signalized intersection, the eastbound approach on Kamehameha Highway includes an exclusive left-turn lane, two through lanes, and a shared through and right-turn lane, while the westbound approach includes three through lanes and exclusive turning lanes. Honomanu Street is a predominantly two-lane, two-way roadway generally oriented in the north-south direction that serves as a connector roadway between Moanalua Road and Kamehameha Highway. At the intersection with Kamehameha Highway, the southbound approach on Honomanu Street includes a shared left-turn and through lane and an exclusive right-turn lane. The south leg of the intersection is comprised of McGrew Loop, a two-lane, two-way roadway that provides access to an adjacent residential subdivision. At the intersection with Kamehameha Highway and Honomanu Street, the northbound approach on McGrew Loop includes one lane that serves all traffic movements.

Southeast of the intersection with Honomanu Street, Kamehameha Highway transitions as a north-south roadway and intersects the northern segment of Salt Lake Boulevard (hereafter referred to as “north”). At this signalized intersection, the northbound and southbound approaches of Kamehameha Highway include 4 through lanes. Salt Lake Boulevard is a predominantly six-lane, two-way urban arterial generally oriented in the east-west direction between Kamehameha Highway and
PHASE 1A and 1B - INGRESS

- STADIUM GATE A and PARKING
- STADIUM GATE B and PARKING
- STADIUM GATE C and PARKING
- STADIUM GATE D and PARKING
- PEDESTRIAN PATHWAYS

NEW ALOHA STADIUM ENTERTAINMENT DISTRICT

CIRCULATION PLAN FOR STADIUM SPECIAL EVENTS - INGRESS

FIGURE 4A

NEW ALOHA STADIUM ENTERTAINMENT DISTRICT

CIRCULATION PLAN FOR STADIUM SPECIAL EVENTS - EGRESS

FIGURE 4B
Puuloa Road. In the vicinity of the project, Salt Lake Boulevard diverges resulting in a northern and southern segment and intersecting Kamehameha Highway twice. At the intersection with Kamehameha Highway, the westbound approach on Salt Lake Boulevard (north) includes two exclusive left-turn lanes and two exclusive right-turn lanes. It should be noted that there are signs on this approach prohibiting right-turn traffic movements on red.

South of the intersection with Salt Lake Boulevard (north), Kamehameha Highway intersects the Ford Island Bridge and the southern segment of Salt Lake Boulevard (hereafter referred to as “south”). At this signalized intersection, the northbound and southbound approaches on Kamehameha Highway include two exclusive left-turn lanes, three through lanes, and an exclusive right-turn lane. The west leg of the intersection is comprised of the Ford Island Bridge which provides access to the adjacent military uses on Ford Island. The eastbound approach on Ford Island Bridge includes an exclusive left-turn lane, a shared left-turn and through lane, and an exclusive right-turn lane. The east leg of the intersection is comprised of Salt Lake Boulevard (south) which includes two departure lanes.

Northeast of the intersection with Kamehameha Highway and Ford Island Bridge, Salt Lake Boulevard (south) intersects the northern segment of Salt Lake Boulevard and a driveway for the Aloha Stadium. At this signalized intersection, the westbound approach on Salt Lake Boulevard includes three through lanes and a shared through and right-turn lane. It should be noted that there is a sign provided on this approach prohibiting right-turn traffic movements on red. The northbound approach of Salt Lake Boulevard includes a shared left-turn and through lane, a through lane, and two channelized right-turn lanes. The north leg of the intersection is comprised of a driveway that provides access to the existing Aloha Stadium, which includes three right-turn lanes.

Further east, Salt Lake Boulevard intersects Kalaloa Street. At this signalized T-intersection, the eastbound approach on Salt Lake Boulevard includes two through lanes and a shared through and right-turn lane, while the westbound approach includes a shared left-turn and through lane and two through lanes. Kalaloa Street is a predominantly two-lane two-way roadway that serves as a connector roadway...
between Kamehameha Highway and Salt Lake Boulevard. The northbound approach on Kalaloa Street is comprised of one wide lane that serves left-turn and right-turn movements.

East of the intersection with Kalaloa Street, Salt Lake Boulevard intersects Kahuapaani Street. At this signalized intersection, the eastbound approach on Salt Lake Boulevard has an exclusive left-turn lane, two through lanes, and a shared through and right-turn lane, while the westbound approach includes an exclusive left-turn lane, two through lanes, and an exclusive right-turn lane. In the vicinity of the project, Kahuapaani Street is a predominantly six-lane, two-way urban arterial generally oriented in the north-south direction that provides access to the Moanalua Freeway. At the intersection with Salt Lake Boulevard, the southbound approach on Kahuapaani Street includes an exclusive left-turn lane, a shared left-turn and through lane, a through lane, and exclusive right-turn lane. The south leg of the intersection is comprised of a driveway that serves the adjacent Stadium Marketplace. That approach includes an exclusive left-turn lane, a through lane, and an exclusive right-turn lane.

North of the intersection with Salt Lake Boulevard, Kahuapaani Street intersects Ala Ali Street and Mananai Place. At this signalized intersection, the northbound approach on Kahuapaani Street includes two through lanes and two exclusive turning lanes while the southbound approach includes four through lanes and exclusive turning lanes. The east leg of the intersection is comprised of Ala Ali Street, a predominantly two-lane, two-way roadway. At the intersection with Kahuapaani Street and Mananai Place, the westbound approach of Ala Ali Street includes a shared left-turn and through lane and an exclusive right-turn lane. The west leg of the intersection is comprised of Mananai Place, a local roadway providing controlled access to an adjacent subdivision. The eastbound approach of Mananai Place includes a shared left-turn and through lane and an exclusive right-turn lane.

Further north, Kahuapaani Street intersects Ulune Street. At this signalized intersection, the northbound approach on Kahuapaani Street includes two through lanes and exclusive turning lanes while the southbound approach includes an exclusive left-turn lane, a through lane, and a shared through and right-turn lane.

Ulune Street is a predominantly four-lane collector roadway generally oriented in the east-west direction between Aiea Heights Drive and Halawa Valley Street. At the intersection with Kahuapaani Street, the eastbound approach on Ulune Street includes a shared left-turn and through lane and an exclusive right-turn lane while the westbound approach includes an exclusive left-turn lane, a shared left-turn and through lane, and a shared through and right-turn lane.

North of the project site, Moanalua Road intersects Aiea Access Road. Moanalua Road is a predominantly four-lane, two-way urban arterial generally oriented in the east-west direction. At the intersection with Aiea Access Road, the eastbound approach on Moanalua Road includes a through lane and two exclusive right-turn lanes, while the westbound approach includes an exclusive left-turn lane and two through lanes. It should be noted that a sign is provided on the eastbound approach prohibiting right-turn traffic movements on red. Aiea Access Road is a predominantly three-lane, two-way roadway that serves as a connector roadway between Moanalua Road, Kamehameha Highway, and the Moanalua Freeway. At the intersection with Moanalua Road, the northbound approach of Aiea Access Road includes a shared left-turn and right-turn lane.

B. Traffic Volumes and Conditions

1. General

   a. Field Investigation

   Field investigations were conducted in September 2019 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:
   - Kamehameha Highway, Honomanu Street, and McGrew Loop
   - Kamehameha Highway and Salt Lake Boulevard (North)
   - Kamehameha Highway, Salt Lake Boulevard (South), and Ford Island Bridge
   - Salt Lake Boulevard and Stadium Driveway
   - Salt Lake Boulevard and Kalaola Street
   - Salt Lake Boulevard and Kahuapaani Street
   - Kahuapaani Street, Ala Ali Street, and Mananai Place
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. It should be noted that the HCM 2010 methodology is available with the Synchro software; however, analysis conducted using that methodology is unable to accommodate all the exclusive and shared-lane use configurations in the study area. As such, for the purpose of this report, the HCM 2000 methodology output was used. The analysis is based on the concept of Level of Service (LOS) to identify the traffic impacts associated with traffic demands during the peak periods of traffic.

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

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

2. Existing Peak Hour Traffic
   a. General

Figures 5 and 6 show the existing lane uses and peak hour traffic volumes. The AM peak hour of traffic generally occurs between 7:00 AM and 8:00 AM while the PM peak hour of traffic...
Traffic Impact Report for the New Aloha Stadium Entertainment District

b. Kamehameha Highway, Honomanu Street, and McGrew Loop

At the intersection with Honomanu Street and McGrew Loop, Kamehameha Highway carries 2,484 vehicles eastbound and 844 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 1,070 vehicles traveling eastbound and 2,511 vehicles traveling westbound. The eastbound approach operates at LOS “E” and LOS “C” during the AM and PM peak periods, respectively, while the westbound approach operates at LOS “C” during both peak periods. Traffic queues periodically formed on the Kamehameha Highway approaches of the intersection with the most significant queues observed on the eastbound approach during the AM peak period and on the westbound approach during the PM peak period with queues extending beyond the line of sight during these peak periods. Field observation indicates that the high volume of traffic along Kamehameha Highway contribute to the delays and queueing at this intersection. Although most of these queues cleared the intersection after each traffic signal cycle change, vehicles occasionally had to wait for more than one traffic signal cycle.

Honomanu Street carries 407 vehicles southbound during the AM peak period and 343 vehicles during the PM peak period. The southbound approach on Honomanu Street operates at LOS “F” and LOS “E” during the AM and PM peak periods, respectively. Traffic
queues periodically formed on the southbound approach with average queue lengths of 12-14 vehicles were observed during both peak periods. As previously discussed, the high volume of traffic along the main highway influence traffic operations at this intersection. Field observation also indicates that the long traffic signal cycle and the high volume of southbound vehicles from Honomanu Street accessing the nearby ramp to the Moanalua Freeway contribute to the delays and queueing at this intersection. Although most of these queues cleared the intersection after each traffic signal cycle change, vehicles occasionally had to wait for more than one traffic signal cycle.

McGrew Loop carries 101 vehicles northbound during the AM peak period and 25 vehicles during the PM peak period. This approach operates at LOS “C” and LOS “D” during the AM and PM peak periods, respectively. Minimal queues were observed on the McGrew Loop approach of the intersection with average queue lengths of 1-2 vehicles observed during both peak periods. As previously discussed, the high volume of traffic along the main highway and long traffic signal cycle contribute to the low levels of service at this intersection. It should be noted that the traffic volumes along this approach is relative low throughout the day since the area is landlocked location with limited connectivity to other roadways.

Crosswalks are provided across Kamehameha Highway on the west side of the intersection, as well as across Honomanu Street on the north side of the intersection and across McGrew Loop on the south side of the intersection. During the AM peak period, 21 pedestrians were observed crossing Kamehameha Highway on the west side of the intersection while 8 pedestrians and 2 pedestrians were observed crossing Honomanu Street and McGrew Point on the north and south sides of the intersection, respectively. During the PM peak period, 8 pedestrians were observed crossing Kamehameha Highway on the west side of the intersection while 12 pedestrians and 6 pedestrians were observed crossing the north and south sides of the intersection, respectively.

c. Kamehameha Highway and Salt Lake Boulevard (North)

At the intersection with Salt Lake Boulevard (North), Kamehameha Highway carries 335 vehicles northbound and 1,476 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 1,958 vehicles traveling northbound and 548 vehicles traveling southbound. The northbound approach operates at LOS “B” during both peak periods while the southbound approach operates at LOS “A” during both peak periods. Traffic queues periodically formed on the Kamehameha Highway approaches of the intersection with the most significant queuing observed on the northbound approach during the PM peak period. Average queue lengths of 10-12 vehicles were observed on the northbound approach during this time period. Most of these queues were observed clearing the intersection after each traffic signal cycle change.

Salt Lake Boulevard (North) carries 682 vehicles westbound during the AM peak period and 830 vehicles during the PM peak period. This approach operates at LOS “B” and LOS “C” during the AM and PM peak periods, respectively. Traffic queues periodically formed on the Salt Lake Boulevard (North) approach with the most significant queuing occurring during the PM peak period. Average queue lengths of 8-10 vehicles were observed on the westbound approach during this time period. Most of these queues were observed clearing the intersection after each traffic signal cycle change.

Crosswalks are provided across Kamehameha Highway on the north side of the intersection, as well as across Salt Lake Boulevard on the east side of the intersection. During the AM peak period, 16 pedestrians were observed crossing the north side of the intersection, while 9 pedestrians were observed crossing the east side of the
intersection. During the PM peak period, 4 pedestrians were observed crossing the north side of the intersection, while 6 pedestrians were observed crossing the east side of the intersection.

d. Kamehameha Highway, Ford Island Bridge, and Salt Lake Boulevard (South)

At the intersection with Salt Lake Boulevard and Ford Island Bridge, Kamehameha Highway carries 623 vehicles northbound and 1,749 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 1,852 vehicles traveling northbound and 651 vehicles traveling southbound. The northbound approach operates at LOS “C” during both peak periods while the southbound approach operates at LOS “B” and LOS “C” during the AM and PM peak periods, respectively. Traffic queues periodically formed on the Kamehameha Highway approaches of the intersection with the most significant queueing observed during the PM peak period. Average queue lengths of 11-13 vehicles were observed on the northbound approach during this peak period while average queue lengths of 4-6 vehicles were observed on the southbound approach during the same peak period. Most of these queues were observed clearing the intersection after each traffic signal cycle change.

Ford Island Bridge carries 375 vehicles eastbound during the AM peak period and 627 vehicles during the PM peak period. The Ford Island Bridge approach operates at LOS “C” and LOS “D” the AM and PM peak periods, respectively. Traffic queues periodically formed on the eastbound approach with the most significant queueing observed during the PM peak period. Average queue lengths of 7-9 vehicles were observed on the Ford Island Bridge approach during this peak period.

Crosswalks are provided across Kamehameha Highway on the south side of the intersection, as well as across Salt Lake Boulevard on the east side of the intersection and across the Ford Island Bridge on the west side of the intersection. During the AM peak period, 17 pedestrians were observed crossing on the south side of the intersection, while 2 pedestrians and 12 pedestrians were observed crossing the east and west sides of the intersection, respectively. During the PM peak period, 9 pedestrians were observed crossing on the south side of the intersection, while 8 pedestrians and 5 pedestrians were observed crossing the east and west sides of the intersection, respectively.

e. Salt Lake Boulevard and Stadium Driveway

At the intersection with the Stadium Driveway, Salt Lake Boulevard carries 667 vehicles westbound and 534 vehicles northbound during the AM peak period. During the PM peak period, Salt Lake Boulevard carries 827 vehicles westbound and 430 vehicles northbound. The Salt Lake Boulevard approaches operate at LOS “A” during both peak periods. Minimal traffic queues were observed on the Salt Lake Boulevard approaches with 1-2 vehicles observed during both peak periods.

Crosswalks are provided across Salt Lake Boulevard on the east and north sides of the. During the AM peak period, 7 pedestrians and 9 pedestrians were observed crossing Salt Lake Boulevard on the east and south sides of the intersection. During the PM peak period, 4 pedestrians and 3 pedestrians were observed crossing Salt Lake Boulevard on the east and south sides of the intersection.

f. Salt Lake Boulevard and Kalanianaole Street

At the intersection with Kalanianaole Street, Salt Lake Boulevard carries 513 vehicles eastbound and 697 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 447 vehicles traveling eastbound and 949 vehicles traveling westbound. The eastbound and westbound approaches operate at LOS “A” during both peak periods. Traffic
queues occasionally formed on the Salt Lake Boulevard approaches of the intersection with the most significant queueing observed during the PM peak period. Average queue lengths of 1-3 vehicles were observed on the eastbound approach during this peak period while average queue lengths of 2-4 vehicles were observed on the westbound approach.

Kalaloa Street carries 196 vehicles during the AM peak period and 159 vehicles during the PM peak period. The northbound approach operates at LOS “B” during both peak periods. Traffic queues occasionally formed on the Kalaloa Street approach of the intersection with average queue lengths of 2-3 vehicles observed during both peak periods.

Crosswalks are provided across Salt Lake Boulevard on the west side of the intersection as well as across Kalaloa Street on the south side of the intersection. During the AM peak period, 2 pedestrians were observed crossing Salt Lake Boulevard on the west side of the intersection while 10 pedestrians were observed crossing Kalaloa Street on the south side of the intersection. During the PM peak period, 1 pedestrian was observed crossing Salt Lake Boulevard on the west side of the intersection while 6 pedestrians were observed crossing Kalaloa Street on the south side of the intersection.

**g. Salt Lake Boulevard and Kahuapaani Street**

At the intersection with Kahuapaani Street, Salt Lake Boulevard carries 660 vehicles eastbound and 846 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 539 vehicles traveling eastbound and 1,593 vehicles traveling westbound. The eastbound and westbound approaches operate at LOS “D” and LOS “C” during the AM and PM peak periods, respectively. Traffic queues periodically formed on the Salt Lake Boulevard approaches of the intersection. Average queue lengths of 5-7 vehicles were observed on the eastbound approach during both peak periods while average queue lengths of 7-9 vehicles were observed on the westbound approach during both periods.

Kahuapaani Street carries 1,294 vehicles southbound during the AM peak period and 673 vehicles during the PM peak period. The southbound approach operates at LOS “C” and LOS “D” during the AM and PM peak periods, respectively. Traffic queues were periodically observed on the southbound approach with the most significant queueing observed during the AM peak period. Average queues of 6-8 vehicles were observed on the southbound approach during that peak period. Most of these queues were observed clearing the intersection after each traffic signal cycle change.

The driveway that serves the adjacent Stadium Marketplace carries 142 vehicles northbound during the AM peak period and 166 vehicles during the PM peak period. The northbound approach operates at LOS “D” during both peak periods.

Crosswalks are provided across all the approaches of the intersection. During the AM peak period, 4 pedestrians and 2 pedestrians were observed crossing Salt Lake Boulevard on the east and west sides of the intersection, respectively, while 4 pedestrians and 3 pedestrians were observed crossing Kahuapaani Street on the north and south sides of the intersection, respectively. During the PM peak period, 3 pedestrians and 4 pedestrians were observed crossing Salt Lake Boulevard on the east and west sides of the intersection, respectively, while 4 pedestrians and 2 pedestrians were observed crossing Kahuapaani Street on the north and south sides of the intersection, respectively.

**h. Kahuapaani Street, Ala Alii Street, and Mananai Place**

At the intersection with Ala Alii Street and Mananai Place, Kahuapaani Street carries 645 vehicles northbound and 1,195 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is relatively similar with 1,030 vehicles
traveling northbound and 797 vehicles traveling southbound. The northbound approach operates at LOS “B” during both peak periods while the southbound approach operates at LOS “A” and LOS “B” during the AM and PM peak periods, respectively. Traffic queues occasionally formed on the Kahuapaani Street approaches of the intersection. Average queue lengths of 5-7 vehicles were observed on the northbound approach during both peak periods while average queues lengths of 3-5 vehicles were observed on the southbound approach.

The Ala Alii Street approach of the intersection carries 110 vehicles westbound during the AM peak period and 130 vehicles during the PM peak period. The westbound approach operates at LOS “C” during both peak periods. The Manana Place approach of the intersection carries 166 vehicles eastbound during the AM peak period and 56 vehicles during the PM peak period. The eastbound approach operates at LOS “C” during both peak periods. Traffic queues occasionally formed on the eastbound and westbound approaches of the intersection. Average queue lengths of 2-3 vehicles were observed on the eastbound and westbound approaches during both peak periods.

Crosswalks are provided across Kahuapaani Street on the south side of the intersection as well as across Ala Alii Street on the east side of the intersection and across Manana Place on the west side of the intersection. During the AM peak period, 13 pedestrians were observed crossing the south side of the intersection, while 2 pedestrians were observed crossing the east side of the intersection. During the PM peak period, 6 pedestrians were observed crossing the south side of the intersection, while 3 pedestrians and 2 pedestrians were observed crossing the east and west sides of the intersection, respectively.

i. Kahuapaani Street and Ulune Street

At the intersection with Ulune Street, Kahuapaani Street carries 937 vehicles northbound and 398 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 920 vehicles traveling northbound and 637 vehicles traveling southbound. The northbound and southbound approaches operate at LOS “D” during both peak periods. Traffic queues periodically formed on the Kahuapaani Street approaches of the intersection. Average queue lengths of 5-7 vehicles were observed on the northbound approach with average queue lengths of 9-11 vehicles observed on the southbound approach during both peak periods. Field observation indicates that queueing at this intersection are influenced by vehicles accessing the nearby freeway ramps.

Ulune Street carries 642 vehicles eastbound and 1,139 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are less with 421 vehicles traveling eastbound and 1,287 vehicles traveling westbound. The eastbound approach operates at LOS “B” and LOS “C” during the AM and PM peak periods, respectively, while the westbound approach operates at LOS “C” and LOS “D” during both peak periods, respectively. Traffic queues were periodically observed on the Ulune Street approaches of the intersection. Average queues of 5-7 vehicles were observed on the eastbound approach during both peak periods with average queue lengths of 14-16 vehicles observed on the westbound approach. As previously discussed, field observation indicates that queueing at this intersection is influenced by vehicles accessing the nearby freeway ramps.

Crosswalks are provided across Kahuapaani Street on the north side of the intersection as well as across Ulune Street on the east and west sides of the intersection. During the AM peak period, 5 pedestrians were observed crossing the north side of the intersection
while 2 pedestrians and 7 pedestrians were observed crossing the east and west sides of the intersection, respectively. During the PM peak period, 8 pedestrians were observed crossing the north side of the intersection while 5 pedestrians were observed crossing the west side of the intersection.

j. Moanalua Road and Aiea Access Road

At the intersection with Aiea Access Road, Moanalua Road carries 942 vehicles eastbound and 1,067 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is less with 536 vehicles traveling eastbound and 1,031 vehicles traveling westbound. The eastbound approach operates at LOS “C” during both peak periods while the westbound approach operates at LOS “C” and LOS “B” during the AM and PM peak periods, respectively. Traffic queues periodically formed along the Moanalua Road approaches of the intersection with the most significant queues observed during the AM peak period. Average queue lengths of 12-14 vehicles were observed on the eastbound approach during this peak period with average queue lengths of 10-12 vehicles observed on the westbound approach during the same peak period. Field observation indicates that queuing along Moanalua Road are influenced by vehicles accessing the nearby freeway ramps.

Aiea Access Road carries 201 vehicles northbound during the AM peak period and 412 vehicles during the PM peak period. The northbound approach operates at LOS “D” and LOS “C” during the AM and PM peak periods, respectively. Traffic queues periodically formed on the northbound approach with the most significant queuing observed during the PM peak period. Average queue lengths of 6-8 vehicles were observed on the Aiea Access Road approach during this peak period. Field observation indicates that the high volume of traffic along Moanalua Road contribute to the queuing and delays at this intersection.

A crosswalk is provided across Moanalua Road on the west side of the intersection; however, minimal pedestrians were observed utilizing this crosswalk 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, 10th Edition,” 2017. The ITE trip generation rates are developed empirically by correlating vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per dwelling unit, hotel room, or 1,000 square feet of development. It should be noted that the stadium facility in area 1.4 is not expected to generate external trips during the AM and PM commuter peak periods since special events associated with the stadium are generally expected to be held during evenings, weekends, and other off-peak periods.

Table 2 summarizes the trip generation characteristics related to Phase 1 of the NASED applied to the AM and PM peak hours of traffic.

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### Table 2: Peak Hour Trip Generation for NASED Phase 1 (Cont’d)

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<td></td>
<td>PROJECTED TRIP ENDS</td>
</tr>
<tr>
<td>AM PEAK</td>
<td>ENTER</td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
</tr>
<tr>
<td>PM PEAK</td>
<td>ENTER</td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
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<td>TOTAL</td>
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#### SHOPPING CENTER

<table>
<thead>
<tr>
<th>INDEPENDENT VARIABLE:</th>
<th>1,000 sf of development = 39.685</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PROJECTED TRIP ENDS</td>
</tr>
<tr>
<td>AM PEAK</td>
<td>ENTER</td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
</tr>
<tr>
<td>PM PEAK</td>
<td>ENTER</td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
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</table>

<table>
<thead>
<tr>
<th>AREA 1.3</th>
<th>MULTIFAMILY HOUSING (HIGH-RISE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDEPENDENT VARIABLE:</td>
<td>Dwelling Units = 168</td>
</tr>
<tr>
<td></td>
<td>PROJECTED TRIP ENDS</td>
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<td>AM PEAK</td>
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<td>EXIT</td>
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<td>TOTAL</td>
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<tr>
<td>PM PEAK</td>
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</tr>
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<td></td>
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#### SHOPPING CENTER

<table>
<thead>
<tr>
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<th>1,000 sf of development = 25.45</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td>EXIT</td>
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<table>
<thead>
<tr>
<th>AREA 1.3</th>
<th>HIGH-TURNOVER (SIT-DOWN) RESTAURANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDEPENDENT VARIABLE:</td>
<td>1,000 sf of development = 8</td>
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<tr>
<td></td>
<td>PROJECTED TRIP ENDS</td>
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</tr>
<tr>
<td></td>
<td>EXIT</td>
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<td></td>
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#### HOTEL

<table>
<thead>
<tr>
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<th>Number of Rooms = 244</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>PROJECTED TRIP ENDS</td>
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<td>AM PEAK</td>
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<td></td>
<td>EXIT</td>
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<tr>
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<td>TOTAL</td>
</tr>
<tr>
<td>PM PEAK</td>
<td>ENTER</td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AREA 1.5</th>
<th>MULTIFAMILY HOUSING (HIGH-RISE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDEPENDENT VARIABLE:</td>
<td>Dwelling Units = 65</td>
</tr>
<tr>
<td></td>
<td>PROJECTED TRIP ENDS</td>
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<td>AM PEAK</td>
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<tr>
<td></td>
<td>EXIT</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
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<tr>
<td>PM PEAK</td>
<td>ENTER</td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
</tr>
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</table>

#### SHOPPING CENTER

<table>
<thead>
<tr>
<th>INDEPENDENT VARIABLE:</th>
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</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td></td>
<td>EXIT</td>
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<td>TOTAL</td>
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<tr>
<td>PM PEAK</td>
<td>ENTER</td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
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</table>
Table 2: Peak Hour Trip Generation for NASED Phase 1 (Cont’d)

<table>
<thead>
<tr>
<th>AREA 1.5</th>
<th>GENERAL OFFICE BUILDING</th>
<th>INDEPENDENT VARIABLE:</th>
<th>1,000 sf of development = 45.425</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>PROJECTED TRIP ENDS</td>
</tr>
<tr>
<td>AM PEAK</td>
<td>ENTER</td>
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<tr>
<td></td>
<td>EXIT</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>PM PEAK</td>
<td>ENTER</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>52</td>
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</tr>
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<table>
<thead>
<tr>
<th>AREA 1.6</th>
<th>MULTIFAMILY HOUSING (HIGH-RISE)</th>
<th>INDEPENDENT VARIABLE:</th>
<th>Dwelling Units = 32</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>PROJECTED TRIP ENDS</td>
</tr>
<tr>
<td>AM PEAK</td>
<td>ENTER</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>PM PEAK</td>
<td>ENTER</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>14</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHOPPING CENTER</th>
<th>INDEPENDENT VARIABLE:</th>
<th>1,000 sf of development = 19.439</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>PROJECTED TRIP ENDS</td>
</tr>
<tr>
<td>AM PEAK</td>
<td>ENTER</td>
<td>11</td>
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<td></td>
<td>EXIT</td>
<td>7</td>
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<td>PM PEAK</td>
<td>ENTER</td>
<td>36</td>
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<td></td>
<td>EXIT</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>74</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AREA 1.7</th>
<th>GENERAL OFFICE BUILDING</th>
<th>INDEPENDENT VARIABLE:</th>
<th>1,000 sf of development = 12.575</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>PROJECTED TRIP ENDS</td>
</tr>
<tr>
<td>AM PEAK</td>
<td>ENTER</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>PM PEAK</td>
<td>ENTER</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>22</td>
<td></td>
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<table>
<thead>
<tr>
<th>SHOPPING CENTER</th>
<th>INDEPENDENT VARIABLE:</th>
<th>1,000 sf of development = 13.3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PROJECTED TRIP ENDS</td>
</tr>
<tr>
<td>AM PEAK</td>
<td>ENTER</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>13</td>
</tr>
<tr>
<td>PM PEAK</td>
<td>ENTER</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>48</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>TOTALS</th>
<th>PROJECTED TRIP ENDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM PEAK</td>
<td>ENTER</td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
</tr>
<tr>
<td>PM PEAK</td>
<td>ENTER</td>
</tr>
<tr>
<td></td>
<td>EXIT</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
</tr>
</tbody>
</table>

The trip generation methodology developed by ITE also includes provisions for the internal capture of trips and multi-modal trips. Internal capture of trips accounts for vehicles that visit more than one destination within the same area without adding external vehicular trips to the surrounding major roadways. Multi-modal trips are trips made utilizing non-
motorized modes of travel such as walking and biking, as well as trips made using transit. The project site is currently served by established, convenient transit routes that may reduce the number of vehicular trips added to the surrounding major roadways. In addition, the City and County of Honolulu is currently developing a fixed guideway transit system that will extend from Kapolei to the central Honolulu area. The first phase of the system from Kapolei to the Aloha Stadium is expected to begin operating by late 2020 with the remaining system fully operational from Kapolei to Ala Moana Center by Year 2025. As previously mentioned, the future Halawa Rail Station is expected to be located within the project site thereby providing convenient access to an alternate mode of travel.

<table>
<thead>
<tr>
<th>PHASE 1 TOTALS</th>
<th>PROJECTED TRIP ENDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM PEAK ENTER</td>
<td>229</td>
</tr>
<tr>
<td>AM PEAK EXIT</td>
<td>235</td>
</tr>
<tr>
<td>AM PEAK TOTAL</td>
<td>464</td>
</tr>
<tr>
<td>PM PEAK ENTER</td>
<td>334</td>
</tr>
<tr>
<td>PM PEAK EXIT</td>
<td>352</td>
</tr>
<tr>
<td>PM PEAK TOTAL</td>
<td>686</td>
</tr>
</tbody>
</table>

2. Trip Distribution

Figure 7 shows the distribution of site-generated traffic during the AM and PM peak periods. Access to the project site will be provided via driveways off Salt Lake Boulevard, Kamehameha Highway, and Kahuapaani Street. The directional distribution of all site-generated vehicles was based upon an assessment of the directional distribution of traffic along the roadways in the vicinity of the project. A comparison of the directional distribution along the roadways in the vicinity of the project indicates that the directionality of traffic is generally consistent given the fact that many of these roadways are regional roadways. This result was also validated by assessment of the relative distribution of traffic at key intersections in the project vicinity which also indicates similar directional distribution. As such, 60% were assumed to be traveling to/from the east while 40% were assumed...
to be traveling to/from the west. Site-generated trips were routed along Kamehameha Highway, Salt Lake Boulevard, and Kahuapai Street based upon their assumed origin/destination and the relative convenience of the available routes. The distribution of all site-generated vehicles at the study intersections was based on their assumed origin/destination, allowed turning movements, and the relative convenience of the available routes.

B. Through Traffic Forecasting Methodology

The travel forecast is based upon available traffic data and historical traffic count data obtained from State of Hawaii traffic count stations in the vicinity of the project site. These data sources indicate relationally stable or declining traffic volumes along the roadways in the project vicinity. As such, an annual traffic growth rate of approximately 1.0% was conservatively assumed in the project vicinity. Using 2019 as the Base Year, a growth rate factor of 1.07 was applied to the existing through traffic demands along the project roadways to achieve the projected Year 2026 traffic demands.

C. Other Considerations

There is another development planned in the vicinity of the project. The project referred to as the “Halawa View Apartments-Phases 2 and 3” entails the replacement of existing smaller buildings and construction of two new residential towers adding 524 new residential units to the existing apartment complex. As included in the “Traffic Impact Report for Halawa View Apartments-Phases 2 and 3” dated February 2019, the proposed project is expected to generate 162 trips during the AM peak period and 189 trips during the PM peak period. Access to the project is expected to continue being provided via an existing two-way driveway off Kalaloa Street with the project anticipated to be completed by Year 2023. As such, for the purpose of this study, the trips associated with the proposed Halawa View Apartments Phases 2 and 3 were incorporated into the Year 2026 without project conditions.

D. Total Traffic Volumes Without Project

The projected Year 2026 AM and PM peak period traffic volumes and operating conditions without the proposed New Aloha Stadium Entertainment District are shown in Figure 8 and summarized in Table 4. The existing levels of service are provided for comparison purposes. LOS calculations are included in Appendix D.

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Approach/ Critical Movement</th>
<th>AM</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kamehameha Hwy/ Honomanu St/ McGrew Lp</td>
<td>Eastbound</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Kamehameha Hwy/ Salt Lake Blvd (North)</td>
<td>Westbound</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Kamehameha Hwy/ Ford Island Bridge/ Salt Lake Blvd (South)</td>
<td>Eastbound</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Salt Lake Blvd/ Stadium Drwy</td>
<td>Westbound</td>
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<td>A</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Salt Lake Blvd/ Kalaloa St</td>
<td>Eastbound</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
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<td>B</td>
</tr>
<tr>
<td>Salt Lake Blvd/ Kahuapai St</td>
<td>Eastbound</td>
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<td>D</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Kahuapai St/ Ala Ali St/ Manana PI</td>
<td>Eastbound</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Kahuapai St/ Ulane St</td>
<td>Eastbound</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
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<td>Westbound</td>
<td>C</td>
<td>C</td>
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<tr>
<td></td>
<td>Northbound</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td>D</td>
<td>D</td>
</tr>
</tbody>
</table>


Table 4: Existing and Projected Year 2026 (Without Project) LOS Traffic Operating Conditions (Cont’d)

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Approach/Critical Movement</th>
<th>AM Exist</th>
<th>Year 2026 w/out Proj</th>
<th>PM Exist</th>
<th>Year 2026 w/out Proj</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moanalua Rd/Asea Access Rd</td>
<td>Eastbound</td>
<td>C</td>
<td>D</td>
<td>C</td>
<td>C</td>
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<tr>
<td></td>
<td>Westbound</td>
<td>C</td>
<td>C</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
<td>D</td>
<td>E</td>
<td>C</td>
<td>C</td>
</tr>
</tbody>
</table>

Under Year 2026 without project conditions, traffic operations are generally expected to remain similar to existing conditions. Along Kahuapaani Street, the approaches at the intersections with Salt Lake Boulevard and Ulune Street are expected to continue operating at LOS “D” or better during both peak periods, while those at the intersection with Ala Ali Street and Manawai Place are expected to continue operating at LOS “C” or better during both peak periods. Along Kamehameha Highway, traffic operations at the intersections with Honomanu Street and Ford Island Bridge are expected to continue operating similar to existing conditions during both peak periods, but traffic operations at the intersection with Salt Lake Boulevard (North) are anticipated to deteriorate slightly from LOS “C” or better to LOS “D” or better during the PM peak period. At the intersection of Moanalua Road and Asea Access Road, traffic operations are also expected to deteriorate from an LOS “D” or better to an LOS “E” or better during the AM Peak period. As previously discussed, the high volume of vehicles accessing the nearby freeway ramps contribute to the queuing and delays at this intersection. The remaining study intersections along Salt Lake Boulevard are expected to continue operating similar to existing conditions.

E. Total Traffic Volumes With Project

Figure 9 shows the Year 2026 cumulative AM and PM peak hour traffic conditions resulting from the projected external traffic and Phase 1 of the proposed NASED. The cumulative volumes consist of site-generated traffic superimposed over...
Year 2026 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.

V. TRAFFIC IMPACT ANALYSIS

The Year 2026 cumulative AM and PM peak hour traffic conditions with Phase 1 of the proposed NASED are summarized in Table 5. The existing and projected Year 2026 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix E.

Table 5: Existing and Projected Year 2026 (Without and With Project)

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Approach/Critical Movement</th>
<th>AM Exist w/out Proj</th>
<th>AM Exist w/ Proj</th>
<th>PM Exist w/out Proj</th>
<th>PM Exist w/ Proj</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kamehameha Hwy/Honomanu St/McGrew Lp</td>
<td>Eastbound</td>
<td>E</td>
<td>E</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
<td>C</td>
<td>C</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td>F</td>
<td>F</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Kamehameha Hwy/Salt Lake Blvd. (North)</td>
<td>Westbound</td>
<td>B</td>
<td>B</td>
<td>B</td>
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Table 5: Existing and Projected Year 2026 (Without and With Project) LOS Traffic Operating Conditions (Cont’d)

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Under Year 2026 with project conditions, traffic operations in the vicinity are generally expected to remain similar to without project conditions. Although Phase 1 of the proposed NASED is expected to add site-generated trips along the adjacent roadways, the project is located in the vicinity of regional roadways with higher capacities to accommodate additional traffic. In addition, project site is located in an area that is accessible via multiple connections to and from regional roadways, with designated ramps to and from the freeways. As such, site-generated trips are dispersed along the different routes to and from the project site, thereby diluting the increases along the individual roadways. Along Salt Lake Boulevard, traffic operations at the intersection with Kamehameha Highway are expected to continue operating at LOS “B” or better during the AM peak period and LOS “D” or better during the PM peak period, while those at the intersection with Kahuapaani Street are expected to continue operating at LOS “D” or better during both peak periods. Along Kahuapaani Street, the approaches at the intersection with Ala Ali Street and Mananai Place are expected to continue operating at LOS “C” or better during both peak periods, while those at the intersection with Ulune Street are expected to continue operating at LOS “D” or better during both peak periods. The remaining study intersections along Kamehameha Highway and Moanalua Road are also expected to continue operating similar to without project conditions. Although traffic operations during the AM and PM peak periods are generally expected to continue operating similar to without project conditions, special consideration should be given to the special events associated with the stadium as the increases in traffic volumes during those events are significantly higher and as such, should be managed separately.

VI. MULTIMODAL FACILITIES

A. Pedestrian Facilities

1. Existing Conditions

Pedestrian facilities in the vicinity of the project are generally comprised of improved sidewalks, crosswalks, pedestrian signal phases, and curb ramps. Along the project frontage on Kamehameha Highway, Salt Lake Boulevard, and Kahuapaani Street, improved sidewalks are provided along the roadway with crosswalks, curb ramps, and protected pedestrian signal phases at the study intersections to facilitate crossings. In addition, a pedestrian bridge spans over the Moanalua Freeway providing a connection between the project site and adjacent uses along Moanalua Road. However, existing gaps and obstacles along the connecting roadways impact connectivity and convenient access for pedestrians. Since the project is located in the vicinity of regional roadways that carry large volumes of vehicles, the intersections are widely-spaced with long blocks limiting crossing opportunities for pedestrians. In addition, although improved sidewalks are provided along Kamehameha Highway and Aiea Access Road west of the project site, pedestrians along these roadways must utilize unsignalized crossings at the connecting ramps to/from the freeways to continue walking on the sidewalks.

2. Projected Conditions

The New Aloha Stadium Entertainment District is expected to enhance existing facilities to improve pedestrian connectivity in the project vicinity. A network of pedestrian facilities within the project site is planned to facilitate access between the proposed residential, office, and commercial uses, as well as to provide connectivity to the new Halawa Rail Transit Station (see Figure
10. In conjunction with Phase 1 of the project, a pedestrian bridge that spans across Salt Lake Boulevard is proposed to provide a connection between the transit station and the uses within the northern parcel. In addition, additional pedestrian facilities are also planned to provide connectivity to the existing adjacent residential uses to the north and south, and the Pearl Harbor Bike Trail west of the project site.

B. Bicycle Facilities

1. Existing Facilities

Bicycle facilities generally consist of shared-use paths, bike lanes, protected bike lanes, or shared roadways with pavement markings called sharrows. West of the project site is the Pearl Harbor Bike Path, which stretches between the Aiea Bay State Recreation Area and Waipahu Depot Road. In addition, there are also bike lanes along Kamehameha Highway, but those are located further south of the project site between Halawa Drive and Radford Drive. As such, bicycle facilities along the roadways in the project vicinity are generally limited to shared roadways and bicyclists must share the roadway with other motorists.

2. Bicycle Level of Traffic Stress

Bicycle Level of Traffic Stress (LTS) is a metric developed by the Mineta Transportation Institute used to classify a roadway segment or intersection. The LTS ranking system is based on the amount of traffic stress imposed on cyclists based on variables such as street width, prevailing vehicle speed, and average daily traffic volumes. The Level of Traffic Stress ranges from 1 to 4 and can be assessed for a given segment or intersection via six tables provided by the Mineta Transportation Institute. The general descriptions of the LTS levels are as follows:

- LTS 1: Characterized by strong separation from all except low speed, low volume traffic. Simple crossings. Suitable for children.
Traffic Impact Report for the New Aloha Stadium Entertainment District

- LTS 2: Except in low speed/low volume traffic situations, cyclists have their own place to ride that keeps them from having to interact with traffic except at formal crossings. There is a physical separation from higher speed and multilane traffic. Crossings are easy for an adult to navigate. This refers to a level of traffic stress that most adults can tolerate, particularly those sometimes classified as interested but concerned.
- LTS 3: Involves interaction with moderate speed or multilane traffic, or close proximity to higher speed traffic. Refers to a level of traffic stress acceptable to those classified as enthused and confident.
- LTS 4: Involves interaction with higher speed traffic or close proximity to high speed traffic. Refers to a level of stress acceptable only to those classified as strong and fearless.

It should be noted that current LTS methodology assumes no traffic stress is imposed on cyclists at signalized intersections. Guidance provided by the Mineta Transportation Institute includes categorizing signalized intersections as LTS 2.

The LTS of the roadways in the vicinity of the proposed NASED are depicted in Figure 11. As previously discussed, the bicycle facilities in the project vicinity are generally limited to shared roadways where bicyclists must share the roadway with other motorists. In addition, the roadways in the project vicinity are generally comprised of multi-lane roadways with prevailing speeds greater than 25 miles per hour. As such, the roadways in the project vicinity are rated as LTS 4.

3. Projected Conditions

The proposed project is expected to provide bicycle parking on-site for residents, guests, and employees to encourage the use of alternate modes of transport (see Figure 10). In addition, the Oahu Bike Plan published by City and County of Honolulu Department Transportation Services (DTS) includes plans to improve connectivity to existing facilities and provide additional bicycle facilities in the project vicinity. These improvements include the following:

- Extension of the existing Pearl Harbor Bike Path further south to Arizona Memorial Place
- Bike lanes along Kamehameha Highway between Halawa Drive to Waihoa Street

Figure 11: Existing Bicycle Level of Traffic Stress
Traffic Impact Report for the New Aloha Stadium Entertainment District

- Bike lanes along Kalakaua Street between Kamehameha Highway and Salt Lake Boulevard
- Protected bike lanes along Salt Lake Boulevard between Kamehameha Highway and Puuola Road
- Buffered bike lanes between Salt Lake Boulevard and Uluane Street
- Bike lanes along Moanalua Road between Kaimakanai Street and Kahumanu Street

These improvements are depicted on Figure 12. The addition of bicycle facilities are expected to improve the level of traffic stress along the roadways in the project vicinity. However, details regarding the schedule of the aforementioned improvements are not known at this time.

C. Transit Facilities
   1. Existing Conditions
      Public transportation services in the vicinity of the project are provided by the City and County of Honolulu. These services currently consist of fixed route bus services, as well as door-to-door services for people who have difficulty accessing the fixed route services (HandiVan). The fixed route bus services in the project vicinity consist of regional routes along Kamehameha Highway and supplemented by local routes along Salt Lake Boulevard and Kahaapaani Street. There are approximately 8 existing transit stops that are served by 13 bus routes within a quarter mile radius of the proposed project (see Figure 13). In addition to fixed bus routes, the project vicinity is also currently served by the Waikiki Trolley on Wednesdays, Saturdays, and Sundays when the Swap Meet is in operation.

   2. Transit Capacity and Quality of Service Manual (TCQSM)
      Transit Capacity and Quality of Service is a metric used to measure transit availability, comfort, and convenience from both the passenger and transit service provider’s points of view. The framework for this metric is outlined in the Transit Cooperative Research Program (TCRP) Report 165: Transit Capacity and Quality of Service Manual, 3rd Edition (TCQSM) published in 2013 which provides research-based guidance on public transit capacity and quality of service. The quality of service concepts and methods
Traffic Impact Report for the New Aloha Stadium Entertainment District

3. **Transit Level of Service**

Figure 12 summarizes the existing transit LOS for the transit facilities within a quarter-mile radius of the project site. Transit LOS calculations are included in Appendix F. The assessment indicates that facilities along Kamehameha Highway are rated at LOS “C” or better, whereas those along Salt Lake Boulevard are rated at LOS “D” or better. The project vicinity is served by a number of transit facilities that provide connections to local and regional bus routes with headways of 1 hour or less. The environment within the project vicinity is moderately pedestrian-friendly with sidewalks and crosswalks that facilitate access to and from the bus stop locations. Table 6 below summarizes the facilities that are provided at the bus stop locations within a quarter-mile radius of the project.
4. Projected Conditions

Access to transit facilities in the project vicinity is expected to improve with the proposed project. As previously mentioned, the City and County of Honolulu is currently developing a fixed guideway transit system that will extend from Kapolei to the central Honolulu area to provide an alternate mode of travel and increase east-west mobility on Oahu’s most heavily congested corridor. The first phase of the system between Kapolei and the Aloha Stadium is expected to begin operations later this year with the entire system from Kapolei to the Ala Moana Center expected to be completed by Year 2025. The future Halawa Transit Station, which is currently under construction, is located within the project parcel south of Salt Lake Boulevard providing a convenient alternative mode of travel to and from the project site. A pedestrian bridge that spans across Salt Lake Boulevard is also proposed in conjunction with Phase 1 of the project to facilitate pedestrian access between the rail station and the other uses within the northern parcel. The rail station will include a Handi-van drop off, a kiss-and-ride, park-and-ride spaces, and a bus transfer station. In conjunction with the opening of the Halawa Rail Station, the existing bus routes in the project vicinity are expected to be modified to connect to the new rail station with a new route expected to be added to provide a connection between the Halawa Station and downtown Ala Moana.

VII. RECOMMENDATIONS

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

1. Maintain sufficient sight distance for motorists to safely enter and exit the project driveway.

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

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

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

5. If access at the entrances to the parking garages is controlled, provide sufficient storage for entering vehicles at the parking area access controls (i.e. automatic gate, etc.) to ensure queues do not extend onto the adjacent public roadways. The layout and dimensions shall be determined during the design phase.

6. Provide adequate turning and passing area within the proposed passenger loading off Kamehameha Highway to accommodate all anticipated vehicle types such as buses and other large vehicles and ensure queues do not extend onto the adjacent public roadways. The layout and dimensions shall be determined during the design phase.

7. Prepare an overall wayfinding plan for the development that addresses bicycle, pedestrian, transit, as well as passenger loading and delivery.

8. Provide adequate pedestrian connections between the vehicle parking and passenger loading areas and the destinations within the project site with clear wayfinding signs posted at key decision points to direct visitors/patrons to the various destinations on-site.

9. Coordinate with transit companies that serve visitor destinations like Waikiki to ensure that their passenger loading/unloading needs are accommodated on-site. In addition, provide clear wayfinding signs to direct these vehicles to their designated loading areas.

10. Provide additional on-site bicycle facilities including designated and secured bicycle parking, bike connections to adjacent facilities, and wayfinding signs on-site to destinations to encourage the use of alternate modes of travel.
11. Coordinate with Bikeshare Hawaii or other similar entities regarding the feasibility of implementing bike share docking stations in the project vicinity.

12. Incorporate Complete Streets principles, if possible, to enhance the pedestrian experience on-site and in the project vicinity including wider sidewalk widths, and the addition of sidewalk furniture and landscaping treatments.

13. Incorporate on-site pedestrian and bike improvements in the design of the project to increase pedestrian visibility and comfort while traversing the project site. These improvements include marked or protected crosswalks at the internal intersections, raised crosswalks, bulb outs to reduce pedestrian crossing distance, and street lighting. It should be noted that pedestrian and bike traffic may need to cross the large surface lots that ring the border of the project site to access destinations.

14. Provide wayfinding signs for transit users from the adjacent Halawa Rail Station to facilitate access and circulation within the project site. It should be noted that high interaction between the rail station and the uses north of Salt Lake Boulevard are expected during special events.

15. Provide adequate wayfinding signs to direct patrons of the Swap Meet to the designed access points and parking areas. It should be noted that the Swap Meet is currently expected to be housed within the surface parking lots on the north side of the project site some distance from the surrounding roadways.

16. Coordinate with the City and County of Honolulu Department of Transportation Services regarding their plans for additional bicycle facilities in the vicinity of the project.

17. Coordinate with the City and County of Honolulu Department of Planning and Permitting (DPP) on the Halawa Transit Oriented Plan (TOD) to determine the feasibility of incorporating the goals of the TOD Plan into the project site.

18. Prepare additional Traffic Impact Analysis Reports (TIARs) for each phase of development once more information is available to verify projected traffic operating conditions and identify additional potential mitigates measures, if necessary.

19. Coordinate with adjacent stakeholders including the residential neighborhoods and businesses in the project vicinity to facilitate connectivity and access between the project site and the adjacent uses.

20. Prepare a Construction Management Plan (CMP) for the development as a whole or in parts, depending on how construction is phased. These plans should include discussions regarding the anticipated construction schedule, phasing, coordination with other ongoing projects, as well as traffic circulation, traffic control, and parking during the construction period.

21. Coordinate with the Honolulu Authority for Rapid Transportation (HART) to ensure that the construction of the planned developments within the HART parcel does not impact access to the rail station.

22. Prepare a Transportation Management Plan which includes traffic circulation, parking, loading, and traffic demand management strategies to minimize the impact of the special events and other off-peak activities associated with the NASED on the surrounding roadways, as well as a clear public information plan to relay changes to the traffic circulation in the project vicinity to the public during special events. The TMP should incorporate multiple levels of management strategies depending on the size of events.

23. Update the TMP after each subsequent phase of the proposed project is completed to incorporate changes in the traffic circulation in the project vicinity as result of the completion of other developments.

VIII. CONCLUSION

The proposed project entails the redevelopment of the existing site for the Aloha Stadium into the New Aloha Stadium Entertainment District. The new development is expected to include a new stadium arena with other multi-use developments to support. The proposed NASED is expected to be implemented in 3 general phases over the next 10+ years with Phase 1 expected to be completed by Year 2026. As previously discussed, the details regarding the later phases are still being developed at this time and as such, the analysis contained herein incorporates the developments associated with Phase 1 only. Phase 1 of the NASED entails the construction of the new stadium arena with 6 additional developments that will include residential, commercial, office, and hotel uses. In addition, improvements are also proposed to provide pedestrian access to the future Halawa Rail Station and enhance connectivity to the adjacent uses. With the completion of Phase 1 of the NASED, traffic operations in the vicinity of the project are generally expected to remain similar to without project conditions during the AM and PM peak periods primarily due to the project’s proximity to regional roadways that are able to accommodate the addition of site-generated traffic. In addition, the project is located in an area with multiple connections to regional roadways and designated ramps to and from the freeways, thereby dispersing the project generated trips along multiple routes. Although traffic operations during the AM and PM peak periods are generally expected to remain similar to existing conditions, special events associated with the stadium can significantly increase traffic in the vicinity. As such, the
preparation of a Transportation Management Plan which includes traffic circulation, parking, loading, and traffic demand management strategies, as well as a clear public information plan to relay changes to the traffic circulation in the project vicinity is recommended to minimize the impact of the special events and other off-peak activities associated with the NASED on the surrounding roadways.

APPENDIX A
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### Wilson Okamoto Corporation

**1907 S. Beretania Street, Suite 400**  
Hawaii, HI 96826

**Counted by:** WL, SS  
**Counters:** TU-0654, TU-2606  
**Weather:** CLEAR  
**Start Date:** 9/10/2019  
**Page No.:** 1

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**Salt Lake Boulevard**

<table>
<thead>
<tr>
<th>Time</th>
<th>Southbound</th>
<th>Northbound</th>
<th>Eastbound</th>
<th>App Total</th>
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<td>136</td>
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<td>06:00 AM</td>
<td>77</td>
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<td>11</td>
<td>165</td>
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<tr>
<td>07:00 AM</td>
<td>102</td>
<td>98</td>
<td>12</td>
<td>212</td>
</tr>
<tr>
<td>08:00 AM</td>
<td>137</td>
<td>137</td>
<td>12</td>
<td>286</td>
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<tr>
<td>09:00 AM</td>
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**Grand Total**

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<td>119</td>
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**% App Total**

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<th>App Total</th>
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</thead>
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<td>8.3%</td>
<td>1.4%</td>
<td>19.8%</td>
</tr>
<tr>
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<td>11.0%</td>
<td>9.3%</td>
<td>1.3%</td>
<td>21.6%</td>
</tr>
<tr>
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<td>11.9%</td>
<td>1.2%</td>
<td>27.5%</td>
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### Wilson Okamoto Corporation

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Hawaii, HI 96826

**Counted by:** WL, SS  
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<th>Southbound</th>
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<th>Eastbound</th>
<th>App Total</th>
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<td>05:30 PM</td>
<td>84</td>
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<td>202</td>
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**Grand Total**

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<td>214</td>
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**% App Total**

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Location: Kamershehe Hvy & Ford Island Bridge/Salt Lake Blvd
City: Aiea
Cont.:
Project ID: 19-02069-00
Date: 10/10/2019

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| PM       |   |   |     |   |   |      |   |   |   |   |   |     |     |     |     |     |     |     |     |     |
|          |   |   |     |   |   |      |   |   |   |   |   |     |     |     |     |     |     |     |     |     |
| Total    |   |   |     |   |   |      |   |   |   |   |   |     |     |     |     |     |     |     |     |     |

Location: Salt Lake Blvd & Kapiolani St
City: Aiea
Cont.:
Project ID: 19-02069-00
Date: 10/10/2019
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### VOLUME

**Kamehameha Hwy N/O Salt Lake Blvd**

**Day:** Tuesday  
**Date:** 9/10/2010  
**City:** Hanalei  
**Project #:** H199_2070_002

#### DAILY TOTALS

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#### SPLITS %

- **SPL %:** 37.1%  
- **N/S:** 62.9%  
- **Total:** 100.0%

---

#### DAILY TOTALS

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#### AAM

- **Average AM Volume:** 5528  
- **Average PM Volume:** 15265  
- **Total Volume:** 20793  
- **Total Flow:** 30803  
- **Average PM Split:** 63.0%  
- **Average AM Split:** 37.0%  
- **Total Split:** 100.0%

---

#### 24 Hour

- **AM Flow:** 5528  
- **PM Flow:** 15265  
- **Total Flow:** 20793  
- **Average Flow:** 8656  
- **Average Flow Volume:** 13164  
- **Total Flow Volume:** 26328  
- **Total Flow Volume:** 26328  
- **Average Flow Volume:** 13164  
- **Total Flow Volume:** 26328  
- **Total Flow Volume:** 26328

---

#### Notes

- Prepared by National Data & Surveying Services
### Bikes

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**Peak HR Vol:**

- **AM:** 11
- **PM:** 11

**Peak HR Factor:**

- **AM:** 0.50
- **PM:** 0.50
### Bikes

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**TOTAL VOLUMES**

- **Peak Factor**: 1.0

---

### Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu HI 96816

Counted by: GH, AN
Counters: TU-2605, TU-0649
Weather: CLEAR

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#### Stadium Drive

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### Groups Printed-Unshifted

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### Peak Hour Analysis

- **Peak Hour From**: 08:00 AM to 08:45 AM
- **Peak of 1**: 08:45 AM

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#### Stadium Drive

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### Notes

- Location: Kalakaua Ave & Salt Lake Blvd
- City: Waikiki
- Counted By: GH, AN
- Site Code: 00000001
- Start Date: 9/10/2019
- Page No: 1

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### Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu HI 96816

Counted by: GH, AN
Counters: TU-2605, TU-0649
Weather: CLEAR
### Wilson Okamoto Corporation

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

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**Grand Total**

- **Right**: 48
- **Peds**: 14
- **App. Total**: 63
- **Thru**: 2,126
- **Total**: 1,217
- **Total %**: 77.8
- **Appro %**: 22.2
- **Total %**: 4.4

### Wilson Okamoto Corporation

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

**Groups Printed-Unfiled**

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**Grand Total**

- **Right**: 102
- **Peds**: 106
- **App. Total**: 112
- **Thru**: 28
- **Total %**: 28.9
- **Appro %**: 3.9
- **Total %**: 0.4

---

**Peak Hour Analysis**: From 08:00 AM to 08:45 AM - Peak 1 of 1

**Peak Hour for Entire Intersection Begins at 08:30 AM**

---

**Wilson Okamoto Corporation**

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

Counted by: GH, AN
Counters: TU-2605, TU-0649
Weather: CLEAR

File Name: SAL STA PM
Site Code: 00000001
Start Date: 9/10/2019
Page No: 1

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**Wilson Okamoto Corporation**

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

Counted by: WL, SS
Counters: TU-0654, TU-2606
Weather: CLEAR

File Name: SAL KAL AM
Site Code: 00000002
Start Date: 9/10/2019
Page No: 1

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### Project ID: 19-0209-004

**Date:** 9/10/2019

**Location:** Kamrhamtha Hwy & Salt Lake Blvd

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### Project ID: 19-0209-032

**Date:** 9/10/2019

**Location:** Area Access Rd & Mbanuku Rd

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### Notes:
- The tables show the volume of pedestrian traffic at different times of the day.
- The columns represent different directions and legs of the streets.
- The values indicate the number of pedestrians crossing at each time.
### Pedestrians (Crosswalks)

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### Pedestrians (Crosswalks)

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### Pedestrians (Crosswalks)

**Location:** Ala Ali St & Kahuaapi St  
**City:** Aiea  
**Project ID:** 19-0099-01  
**Date:** 9/10/2019

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<td><strong>WB</strong></td>
<td><strong>EB</strong></td>
<td><strong>WB</strong></td>
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## Pedestrians (Crosswalks)

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<th>N/O Salt Lake Blvd</th>
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<td>EAST LEG</td>
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</tr>
<tr>
<td></td>
<td>EB</td>
<td>WB</td>
<td>EB</td>
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<tr>
<td>8:45 AM</td>
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<td>0</td>
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<td>0</td>
</tr>
<tr>
<td><strong>TOTAL VOLUMES</strong>:</td>
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<td>WB</td>
<td>EB</td>
<td>WB</td>
</tr>
<tr>
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<td>1</td>
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<tr>
<td>50.00% 50.00%</td>
<td>0.00% 100.00%</td>
<td>0.00%</td>
<td>100.00%</td>
<td>0.00%</td>
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<td><strong>PEAK HR</strong>:</td>
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<td>06:15 AM - 07:45 AM</td>
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<td>0.290</td>
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<tr>
<td><strong>PEAK HR FACTOR</strong>:</td>
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<td>0.290</td>
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| **PM**        | NORTH LEG      | SOUTH LEG      | EAST LEG          | WEST LEG          |
|               | EB  | WB  | EB  | WB  | NB  | SB  | NB  | SB  | TOTAL |
| 6:00 PM       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 6:15 PM       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 6:30 PM       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 6:45 PM       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 7:00 PM       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 7:15 PM       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 7:30 PM       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 7:45 PM       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 8:00 PM       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 8:15 PM       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 8:30 PM       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 8:45 PM       | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| **TOTAL VOLUMES** | BB | WB | EB | WB | NB | SB | NB | SB | TOTAL |
|               | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     |
| 49.04% 49.04%| 0.00% 99.96% | 0.00% | 99.96% | 0.00% | 99.96% | 0.00% | 99.96% | 0.00% | 99.96% |
| **PEAK HR**: | 03:30 PM - 04:30 PM | 03:30 PM - 04:30 PM |
| **PEAK HR VOLS**: | 0.290 | 0.290 |
| **PEAK HR FACTOR**: | 0.290 | 0.290 |
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

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<th>Level of Service</th>
<th>Control Delay per Vehicle (sec/veh)</th>
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<tr>
<td>A</td>
<td>≤10.0</td>
</tr>
<tr>
<td>B</td>
<td>&gt;10.0 and ≤20.0</td>
</tr>
<tr>
<td>C</td>
<td>&gt;20.0 and ≤35.0</td>
</tr>
<tr>
<td>D</td>
<td>&gt;35.0 and ≤55.0</td>
</tr>
<tr>
<td>E</td>
<td>&gt;55.0 and ≤80.0</td>
</tr>
<tr>
<td>F</td>
<td>&gt;80.0</td>
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</table>

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.

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.

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**Intersection Summary**

- HCM 2000 Control Delay (s) | 9.9 |
- HCM 2000 Volume to Capacity | 0.48 |
- Actuated Cycle Length (s) | 55.3 |
- Sum of lost time (s) | 15.0 |
- Intersection Capacity Utilization | 46.6% |
- ICU Level of Service | A |
- Analysis Period (min) | 15 |

**APPENDIX C**

**CAPACITY ANALYSIS CALCULATIONS**

**EXISTING PEAK PERIOD TRAFFIC ANALYSIS**

AM Existing Synchro 11 Report

HCM Signalized Intersection Capacity Analysis

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### Intersection Summary

- **HCM 2000 Control Delay**: 3.0
- **HCM 2000 Level of Service**: A
- **HCM 2000 Volume to Capacity ratio**: 0.32
- **Actuated Cycle Length (s)**: 43.8
- **Sum of lost time (s)**: 15.0
- **Intersection Capacity Utilization**: 33.9%
- **ICU Level of Service**: A
- **Analysis Period (min)**: 15

**HCM Signalized Intersection Capacity Analysis Page 3**
**HCM Signalized Intersection Capacity Analysis**

**4: Kalalau St & Salt Lake Blvd**

**5: Kahuaapii St & Salt Lake Blvd**

**AM Existing**

**Synchro 11 Report**

**Page 4**

**Page 5**

**AM Existing**

**Synchro 11 Report**

**Page 4**

**Page 5**

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### Ideal Flow (vph)

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### Peak-hour factor, PHF

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### Traffic Signal Capacity

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### Traffic Signal Capacity

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### Lane Group Capacity (vph)

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### Intersection Summary

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### AM Existing

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### Movement

#### EB

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#### Future Volume (vph)

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#### Lane Util. Factor

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#### Frtr, ped/bikes

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#### Flt Protected

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#### Satd. Flow (perm)

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#### Peak-hour factor, PHF

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#### Adj. Flow (vph)

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## Intersection Summary

- **HCM 2000 Control Delay**: 23.1
- **HCM 2000 Volume to Capacity ratio**: 0.83
- **Actuated Cycle Length (s)**: 104.6
- **Sum of lost time (s)**: 15.0
- **Intersection Capacity Utilization**: 65.3%
- **Critical Lane Group**: C

---

**AM Existing**

**HMCSignaled Intersection Capacity Analysis**

**Synchro 11 Report**

**Page 8**
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**Intersection Summary**

| HCM 2000 Control Delay | 19.7 | B |
| HCM 2000 Volume to Capacity ratio | 0.70 | A |
| Actuated Cycle Length (s) | 104.4 | 15.0 |
| Intersection Capacity Utilization | 64.0% | B |
| Analysis Period (min) | 15 | c |
| Critical Lane Group | c |

**PM Existing**

**Synchro 11 Report**

---

**HCM Signalized Intersection Capacity Analysis**

1: Kamehameha Hwy & Salt Lake Blvd

---

**HCM Signalized Intersection Capacity Analysis**

2: Kamehameha Hwy & Ford Island Bridge/Salt Lake Blvd

---
### Movement: EBT EBR WBT WBR NBT NBR

#### Traffic Volume (vph)

- EBT: 350
- EBR: 97
- WBT: 147
- WBR: 822
- NBT: 30
- NBR: 129

#### Ideal Flow (vph)

- EBT: 350
- EBR: 97
- WBT: 147
- WBR: 822
- NBT: 30
- NBR: 129

#### Total Lost Time (s)

- EBT: 5.0
- EBR: 5.0
- WBT: 4.0
- WBR: 5.0

#### Lane Util. Factor

- EBT: 0.86
- EBR: 0.95
- WBT: 0.88
- WBR: 1.00

#### Frpb, ped/bikes

- EBT: 1.00
- EBR: 1.00
- WBT: 0.98
- WBR: 1.00

#### Flpb, ped/bikes

- EBT: 1.00
- EBR: 1.00
- WBT: 1.00
- WBR: 1.00

#### Frt

- EBT: 1.00
- EBR: 1.00

#### Flt Protected

- EBT: 1.00
- EBR: 0.98

#### Satd. Flow (prot)

- EBT: 4893
- EBR: 5045
- WBT: 1763
- WBR: 1559

#### Flt Permitted

- EBT: 1.00
- EBR: 0.95

#### Satd. Flow (perm)

- EBT: 4893
- EBR: 5045
- WBT: 1763
- WBR: 1559

#### Peak-hour factor, PHF

- EBT: 0.94
- EBR: 0.94
- WBT: 0.94
- WBR: 0.94

#### Adj. Flow (vph)

- EBT: 368
- EBR: 102
- WBT: 155
- WBR: 844

#### RTOR Reduction (vph)

- EBT: 0
- EBR: 1
- WBT: 1
- WBR: 5

#### Lane Group Flow (vph)

- EBT: 430
- EBR: 999
- WBT: 32
- WBR: 21

#### Confl. Peds. (#/hr)

- EBT: 5
- EBR: 4
- WBT: 5
- WBR: 4

#### Turn Type

- EBT: NA
- EBR: Split
- WBT: NA
- WBR: Free

#### Approach Delay (s)

- EBT: 3.6
- EBR: 4.4
- WBT: 15.3

#### Approach LOS

- EBT: A
- EBR: A
- WBT: B
- WBR: B

#### Intersection Summary

- HCM 2000 Control Delay: 2.9
- HCM 2000 Level of Service: A
- HCM 2000 Volume to Capacity ratio: 0.27
- HCM 2000 Cycle Length (s): 47.9
- HCM 2000 Level of Service: A

---

### Movement: EBT EBR WBT WBR NBT NBR

#### Traffic Volume (vph)

- EBT: 350
- EBR: 97
- WBT: 147
- WBR: 822
- NBT: 30
- NBR: 129

#### Ideal Flow (vph)

- EBT: 350
- EBR: 97
- WBT: 147
- WBR: 822
- NBT: 30
- NBR: 129

#### Total Lost Time (s)

- EBT: 5.0
- EBR: 5.0
- WBT: 4.0
- WBR: 5.0

#### Lane Util. Factor

- EBT: 0.86
- EBR: 0.95
- WBT: 0.88
- WBR: 1.00

#### Frpb, ped/bikes

- EBT: 1.00
- EBR: 1.00
- WBT: 0.98
- WBR: 1.00

#### Flpb, ped/bikes

- EBT: 1.00
- EBR: 1.00
- WBT: 1.00
- WBR: 1.00

#### Frt

- EBT: 1.00
- EBR: 1.00

#### Flt Protected

- EBT: 1.00
- EBR: 0.98

#### Satd. Flow (prot)

- EBT: 4893
- EBR: 5045
- WBT: 1763
- WBR: 1559

#### Flt Permitted

- EBT: 1.00
- EBR: 0.95

#### Satd. Flow (perm)

- EBT: 4893
- EBR: 5045
- WBT: 1763
- WBR: 1559

#### Peak-hour factor, PHF

- EBT: 0.94
- EBR: 0.94
- WBT: 0.94
- WBR: 0.94

#### Adj. Flow (vph)

- EBT: 368
- EBR: 102
- WBT: 155
- WBR: 844

#### RTOR Reduction (vph)

- EBT: 0
- EBR: 1
- WBT: 1
- WBR: 5

#### Lane Group Flow (vph)

- EBT: 430
- EBR: 999
- WBT: 32
- WBR: 21

#### Confl. Peds. (#/hr)

- EBT: 5
- EBR: 4
- WBT: 5
- WBR: 4

#### Turn Type

- EBT: NA
- EBR: Perm
- WBT: NA
- WBR: Perm

#### Protected Phases

- EBT: 6
- EBR: 2

#### Approach Delay (s)

- EBT: 3.6
- EBR: 4.4
- WBT: 15.3

#### Approach LOS

- EBT: A
- EBR: A
- WBT: B
- WBR: B

#### Intersection Summary

- HCM 2000 Control Delay: 5.3
- HCM 2000 Level of Service: A
- HCM 2000 Volume to Capacity ratio: 0.35
- HCM 2000 Cycle Length (s): 41.7
- HCM 2000 Level of Service: A
- Analysis Period (min): 15

---
Lane Configurations

Future Volume (vph) 160 345 34 90 660 843 71 69 26 394 62 217
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 5.0 5.0 5.0 5.0
Lane Util. Factor 1.00 0.91 1.00 0.95 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00
Frtrb, ped/bikes 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Flt Protected 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00
Satd. Flow (prot) 1770 5008 1770 5008 1594 1770 1833 1594 1546 1610 3206 1546
Flt Permitted 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00
Satd. Flow (perm) 1770 5008 1770 5008 1594 1770 1833 1594 1546 1610 3206 1546
Realtime 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) 167 359 35 94 668 878 74 72 27 410 65 236
RTOR Reduction (vph) 0 7 0 0 369 0 0 24 0 0 184
Lane Group Flow (vph) 167 387 0 94 668 479 74 72 2 325 270 42
Conf. Bias (lhr) 6 6 7 7 8 6 8 8 8 8 8 8

Turn Type Prot NA Prot NA Perm Split NA Perm Split NA Perm
Permitted Phases 1 6 2 4 4 8 8
Actuated Green, G (s) 17.8 55.3 12.6 50.1 50.1 12.6 12.8 12.8 22.9 22.9 22.9
Effective Green, G (s) 17.8 55.3 12.6 50.1 50.1 12.6 12.8 12.8 22.9 22.9 22.9
Actuated g/C Ratio 0.14 0.45 0.10 0.41 0.41 0.10 0.13 0.19 0.14 0.19 0.19 0.19
Clearance Time (s) 5.0 5.0 5.0 5.0 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 3.0 3.0 3.0 3.0
Lane Cap (vph) 254 2240 180 1543 626 183 192 160 298 606 286
v/s Ratio Prot 0.09 0.08 0.05 0.19 0.04 0.04 0.13 0.08
v/s Ratio Perm 0.31 0.31 0.31 0.31 0.31 0.31 0.31 0.31 0.31
v/s Ratio Prot 0.54 0.48 0.76 0.40 0.38 0.02 0.69 0.45 0.15
v/s Ratio Perm 0.54 0.48 0.76 0.40 0.38 0.02 0.69 0.45 0.15
Unlefty Delay, d1 50.0 20.5 52.6 27.1 31.6 51.8 51.7 49.8 47.0 44.7 42.2
Progression Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Unlefty Delay, d2 6.0 0.10 2.7 0.32 3.4 1.5 1.2 0.0 6.5 0.3 0.2
Delay (s) 56.0 20.5 55.4 27.4 37.0 53.3 52.9 49.8 53.5 45.2 42.4
Effective Green, g (s) 8.8 8.8 8.8 8.8 7.3 31.4 31.4 7.3 31.4 31.4 7.3 31.4
actuated g/C Ratio 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14
Clearance Time (s) 5.0 5.0 5.0 5.0 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 3.0 3.0 3.0 3.0
Lane Cap (vph) 187 217 202 217 204 171 79 221 324 79 1
v/s Ratio Prot 0.04 0.36 0.04 0.36 0.10 0.36 0.04 0.36 0.10 0.36 0.04 0.36
v/s Ratio Perm 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03
Unlefty Delay, d1 23.9 23.4 23.8 23.6 23.8 20.8 8.1 25.8 8.5 7.8
Progression Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Unlefty Delay, d2 0.4 0.0 0.3 0.1 1.2 0.3 0.0 0.4 0.0 0.4 0.0 0.4
Delay (s) 24.2 23.5 24.0 23.7 27.1 11.1 8.1 27.0 8.6 7.8
Effective Green, g (s) 8.8 8.8 8.8 8.8 7.3 31.4 31.4 7.3 31.4 31.4 7.3 31.4
actuated g/C Ratio 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14
Clearance Time (s) 5.0 5.0 5.0 5.0 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 3.0 3.0 3.0 3.0

PM Existing

HCM Signalized Intersection Capacity Analysis Page 5

PM Existing

HCM Signalized Intersection Capacity Analysis Page 6
### Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR

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#### Intersecion Summary

- **HCM 2000 Control Delay**: 39.3
- **HCM 2000 Volume to Capacity ratio**: 0.72
- **Actuated Cycle Length (s)**: 119.4
- **Intersection Capacity Utilization**: 74.0%
- **Analysis Period (min)**: 16

- Critical Lane Group
### Movement Configuration

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<td>102 961 7 48 2021 442 10 2 13 274 2 67</td>
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### Traffic Analysis

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| | Peak-hour factor, PHF | Adjusted Flow (vph) | RTOR Reduction (vph) | Lane Group Flow (vph) | Confl. Peds. (#/hr) | Confl. Bikes (#/hr) |
|----------------------|----------------------|---------------------|----------------------|---------------------|---------------------|
| | 0.98 0.98 0.98 0.98 0.98 0.98 |

### Intersection Summary

- Critical Lane Group: c

### APPENDIX D

**CAPACITY ANALYSIS CALCULATIONS**

**PROJECTED YEAR 2026 PEAK PERIOD TRAFFIC ANALYSIS WITHOUT PROJECT**

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**HCM Signalized Intersection Capacity Analysis**

- McGew Ln/Honomanu St & Kamehameha Hwy
- Synchro 11 Report
- Page 9
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**Intersection Summary**

- HCM Future 2035
- Synchro 11 Report
- Page 1

---

**HCM Signalized Intersection Capacity Analysis**

1: Kamehameha Hwy & Salt Lake Blvd

**Movement**

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**Intersection Summary**

- HCM Future 2035
- Synchro 11 Report
- Page 2
### Movement 3: Salt Lake Blvd

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#### Intersection Summary

- **HCM 2000 Control Delay**: 6.5
- **HCM 2000 Level of Service**: A
- **HCM 2000 Volume to Capacity ratio**: 0.28
- **Actuated Cycle Length (s)**: 37.2
- **Sum of lost time (s)**: 10.0
- **HCM 2000 Level of Service**: A


### Movement 4: Kalalau St & Salt Lake Blvd

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#### Intersection Summary

- **HCM 2000 Control Delay**: 6.5
- **HCM 2000 Level of Service**: A
- **HCM 2000 Volume to Capacity ratio**: 0.34
- **Actuated Cycle Length (s)**: 37.2
- **Sum of lost time (s)**: 10.0
- **HCM 2000 Level of Service**: A


---

**Legend**

- EBT: Eastbound through
- EBR: Eastbound right
- WBL: Westbound left
- WBT: Westbound through
- NBL: Northbound left
- NBR: Northbound right

**Note:**

- All times are in seconds (s)
- All ratios are as compared to the ideal flow (vphpl)
- Lane Util. Factor: Actual flow divided by ideal flow
- Frpb, ped/bikes: Free flow rate per bike
- Flpb, ped/bikes: Flow rate per bike
- Fruition: Flow rate per vehicle
- Satd. Flow: Saturated flow
- PHF: Peak-hour factor
- Adj. Flow: Adjusted flow
- RTOR: Reduction time on red
- Lane Grp Cap: Lane group capacity
- v/s Ratio: Vehicle-to-spacing ratio
- v/c Ratio: Vehicle-to-capacity ratio
- Uniform Delay: Uniform delay
- Approach Delay: Approach delay
- Level of Service: Level of service
+&06LJQDOL]HG,QWHUVHFWLRQ&DSDFLW\$QDO\VLV
.DKXDSDDQL6W 6DOW/DNH%OYG

Movement
Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor
Frpb, ped/bikes
Flpb, ped/bikes
Frt
Flt Protected
Satd. Flow (prot)
Flt Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph)
Lane Group Flow (vph)
Confl. Peds. (#/hr)
Confl. Bikes (#/hr)
Turn Type
Protected Phases
Permitted Phases
Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s)
Lane Grp Cap (vph)
v/s Ratio Prot
v/s Ratio Perm
v/c Ratio
Uniform Delay, d1
Progression Factor
Incremental Delay, d2
Delay (s)
Level of Service
Approach Delay (s)
Approach LOS

EBL

EBT

EBR

WBL

WBT

WBR

NBL

NBT

NBR

SBL

SBT

SBR

153
153
1900
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1.00
1.00
1.00
1.00
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1770
0.95
1770
0.89
172
0
172
5

530
530
1900
5.0
0.91
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596
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608

12
12
1900

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1770
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391
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5.0
0.95
1.00
1.00
1.00
1.00
3539
1.00
3539
0.89
439
0
439

51
51
1900
5.0
1.00
1.00
1.00
1.00
0.95
1770
0.95
1770
0.89
57
0
57
6

58
58
1900
5.0
1.00
1.00
1.00
1.00
1.00
1863
1.00
1863
0.89
65
0
65

33
33
1900
5.0
1.00
0.98
1.00
0.85
1.00
1547
1.00
1547
0.89
37
33
4
8

789
789
1900
5.0
0.91
1.00
1.00
1.00
0.95
1610
0.95
1610
0.89
887
0
443
7

71
71
1900
5.0
0.91
1.00
1.00
1.00
0.96
3252
0.96
3252
0.89
80
0
524

394
394
1900
5.0
1.00
0.98
1.00
0.85
1.00
1553
1.00
1553
0.89
443
277
166
5

Prot
1

NA
6

Prot
5

NA
2

438
438
1900
5.0
1.00
0.98
1.00
0.85
1.00
1549
1.00
1549
0.89
492
381
111
7
2
Perm

Split
4

NA
4

Perm

Split
8

NA
8

Perm

18.5
18.5
0.15
5.0
3.0
258
c0.10

40.2
40.2
0.32
5.0
3.0
1607
0.12

6.9
6.9
0.05
5.0
3.0
96
0.03

28.6
28.6
0.23
5.0
3.0
798
c0.12

12.2
12.2
0.10
5.0
3.0
170
0.03

12.2
12.2
0.10
5.0
3.0
179
c0.03

47.4
47.4
0.37
5.0
3.0
602
c0.28

47.4
47.4
0.37
5.0
3.0
1216
0.16

0.67
51.2
1.00
6.4
57.6
E

0.38
33.6
1.00
0.1
33.7
C
39.0
D

0.50
58.2
1.00
4.1
62.3
E

0.55
43.4
1.00
0.8
44.2
D
43.7
D

0.34
53.5
1.00
1.2
54.6
D

0.36
53.6
1.00
1.3
54.9
D
54.1
D

0.74
34.2
1.00
4.7
38.9
D

0.43
29.6
1.00
0.2
29.8
C
32.1
C

Intersection Summary
HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (min)
c Critical Lane Group

AM Future 2026

05/22/2020

0.89
13
0
0
6
2

38.2
0.63
126.7
64.1%
15

2
28.6
28.6
0.23
5.0
3.0
349
0.07
0.32
40.9
1.00
0.5
41.4
D

HCM 2000 Level of Service
Sum of lost time (s)
ICU Level of Service

4
12.2
12.2
0.10
5.0
3.0
148
0.00
0.02
51.9
1.00
0.1
51.9
D

8
47.4
47.4
0.37
5.0
3.0
580
0.11
0.29
27.8
1.00
0.3
28.1
C

+&06LJQDOL]HG,QWHUVHFWLRQ&DSDFLW\$QDO\VLV
.DKXDSDDQL6W 0DQDQDL3O$OD$OLL6W

Movement
Lane Configurations
Traffic Volume (vph)
Future Volume (vph)
Ideal Flow (vphpl)
Total Lost time (s)
Lane Util. Factor
Frpb, ped/bikes
Flpb, ped/bikes
Frt
Flt Protected
Satd. Flow (prot)
Flt Permitted
Satd. Flow (perm)
Peak-hour factor, PHF
Adj. Flow (vph)
RTOR Reduction (vph)
Lane Group Flow (vph)
Confl. Peds. (#/hr)
Confl. Bikes (#/hr)
Turn Type
Protected Phases
Permitted Phases
Actuated Green, G (s)
Effective Green, g (s)
Actuated g/C Ratio
Clearance Time (s)
Vehicle Extension (s)
Lane Grp Cap (vph)
v/s Ratio Prot
v/s Ratio Perm
v/c Ratio
Uniform Delay, d1
Progression Factor
Incremental Delay, d2
Delay (s)
Level of Service
Approach Delay (s)
Approach LOS

EBL

EBT

EBR

WBL

WBT

WBR

NBL

NBT

NBR

SBL

SBT

SBR

78
78
1900

7
7
1900
5.0
1.00
1.00
1.00
1.00
0.96
1781
0.72
1332
0.88
8
0
97

81
81
1900
5.0
1.00
0.98
1.00
0.85
1.00
1554
1.00
1554
0.88
92
73
19
13

27
27
1900

7
7
1900
5.0
1.00
1.00
0.99
1.00
0.96
1782
0.76
1400
0.88
8
0
39

76
76
1900
5.0
1.00
0.99
1.00
0.85
1.00
1563
1.00
1563
0.88
86
69
17
2

14
14
1900
5.0
1.00
1.00
1.00
1.00
0.95
1765
0.95
1765
0.88
16
0
16
13

675
675
1900
5.0
0.95
1.00
1.00
1.00
1.00
3539
1.00
3539
0.88
767
0
767

83
83
1900
5.0
1.00
1.00
1.00
1.00
0.95
1770
0.95
1770
0.88
94
0
94
2

1182
1182
1900
5.0
0.86
1.00
1.00
1.00
1.00
6408
1.00
6408
0.88
1343
0
1343

8
8
1900
5.0
1.00
1.00
1.00
0.85
1.00
1583
1.00
1583
0.88
9
4
5

NA
6

Perm

Perm

NA
2

Perm

Prot
7

NA
4

18
18
1900
5.0
1.00
0.97
1.00
0.85
1.00
1534
1.00
1534
0.88
20
11
9
15
2
Perm

Prot
3

NA
8

Perm

6
13.2
13.2
0.20
5.0
3.0
312

2

0.8
0.8
0.01
5.0
3.0
21
0.01

29.5
29.5
0.45
5.0
3.0
1591
c0.22

7.9
7.9
0.12
5.0
3.0
213
c0.05

36.6
36.6
0.56
5.0
3.0
3575
0.21

0.76
32.3
1.00
92.1
124.4
F

0.48
12.7
1.00
0.2
12.9
B
15.1
B

0.44
26.8
1.00
1.5
28.3
C

0.38
8.1
1.00
0.1
8.2
A
9.5
A

0.88
89
0
0

Perm
6

Intersection Summary
HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (min)
c Critical Lane Group

D
20.0
C

Synchro 11 Report
Page 5

AM Future 2026

05/22/2020

13.2
13.2
0.20
5.0
3.0
268
c0.07
0.36
22.6
1.00
0.8
23.4
C
22.4
C

0.01
0.06
21.2
1.00
0.1
21.3
C

12.8
0.44
65.6
54.3%
15

0.88
31
0
0
15

13.2
13.2
0.20
5.0
3.0
281
0.03
0.14
21.5
1.00
0.2
21.8
C
21.4
C

2
13.2
13.2
0.20
5.0
3.0
314
0.01
0.06
21.2
1.00
0.1
21.2
C

HCM 2000 Level of Service
Sum of lost time (s)
ICU Level of Service

4
29.5
29.5
0.45
5.0
3.0
689
0.01
0.01
10.0
1.00
0.0
10.0
A

8
36.6
36.6
0.56
5.0
3.0
883
0.00
0.01
6.4
1.00
0.0
6.4
A

B
15.0
A

Synchro 11 Report
Page 6


### Lane Configurations

<table>
<thead>
<tr>
<th>Movement</th>
<th>EBL</th>
<th>EBT</th>
<th>EBR</th>
<th>WBL</th>
<th>WBT</th>
<th>WBR</th>
<th>NBL</th>
<th>NBR</th>
<th>SBL</th>
<th>SBT</th>
<th>SBR</th>
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</thead>
<tbody>
<tr>
<td>Traffic Volume (vph)</td>
<td>41</td>
<td>210</td>
<td>405</td>
<td>750</td>
<td>245</td>
<td>366</td>
<td>51</td>
<td>226</td>
<td>610</td>
<td>60</td>
<td>334</td>
</tr>
</tbody>
</table>

### Future Volume (vph)

| Traffic Volume (vph) | 41 | 210 | 405 | 750 | 245 | 366 | 51 | 226 | 610 | 60 | 334 |

### Ideal Flow (vph)

| Traffic Volume (vph) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |

### Total Lost (s)

| Traffic Volume (vph) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

### Lane Util. Factor

| Traffic Volume (vph) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

### Frp, ped/bikes

| Traffic Volume (vph) | 1.00 | 0.99 | 1.00 | 0.99 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 1.00 | 1.00 |

### Flp, ped/bikes

| Traffic Volume (vph) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

### Fpt Protected

| Traffic Volume (vph) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

### Satl. Flow (prot)

| Traffic Volume (vph) | 1848 | 1563 | 1610 | 3094 | 1770 | 3539 | 1543 | 1770 | 3509 |

### Satd. Flow (prot)

| Traffic Volume (vph) | 1863 | 2711 | 1770 | 3539 | 1770 | 1541 |

### Peak-hour factor, PHF

| Traffic Volume (vph) | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |

### Adj. Flow (vph)

| Traffic Volume (vph) | 105 | 983 | 562 | 679 | 147 | 82 |

### RTOR Reduction (vph)

| Traffic Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |

### Lane Group Flow (vph)

| Traffic Volume (vph) | 105 | 983 | 562 | 679 | 147 | 82 |

### Confl. Peds. (#/hr)

| Traffic Volume (vph) | 7 | 2 | 7 | 12 | 7 | 12 |

### Confl. Bikes (#/hr)

| Traffic Volume (vph) | 6 | 6 |

### Turn Type

| Traffic Volume (vph) | Split | Free | Split | Prot | Prot | Prot | Prot |

| Traffic Volume (vph) | Protected Phases | 4 | 4 | 8 | 8 | 5 | 5 | 1 | 6 |

### Permitted Phases

| Traffic Volume (vph) | 2 | Free |

### Actuated Green, G (s)

| Traffic Volume (vph) | 22.0 | 117.2 | 47.3 | 47.3 | 6.7 | 21.3 | 21.3 | 6.6 | 21.2 |

| Traffic Volume (vph) | 22.0 | 117.2 | 47.3 | 47.3 | 6.7 | 21.3 | 21.3 | 6.6 | 21.2 |

### CLEARANCE TIME (s)

| Traffic Volume (vph) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

### Vehicle Extension (s)

| Traffic Volume (vph) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |

### Lane Grp Cap (vph)

| Traffic Volume (vph) | 346 | 1563 | 649 | 1248 | 101 | 643 | 280 | 99 | 634 |

### v/s Ratio Prot

| Traffic Volume (vph) | 0.14 | 0.31 | 0.20 | 0.03 | 0.09 | 0.34 | 0.10 |

### v/s Ratio Perm

| Traffic Volume (vph) | 0.27 | 0.76 | 0.71 | 0.52 | 0.47 | 0.41 | 0.57 |

### Uniform Delay, d1

| Traffic Volume (vph) | 45.0 | 45.0 | 38.7 | 88.7 | 12.3 | 12.3 |

### Progession Factor

| Traffic Volume (vph) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

### Incremental Delay, d2

| Traffic Volume (vph) | 8.5 | 0.4 | 5.3 | 1.9 | 4.8 | 0.6 | 1.0 | 21.8 | 1.2 |

### Delay (s)

| Traffic Volume (vph) | 53.4 | 35.4 | 31.1 | 58.6 | 43.5 | 43.4 | 76.2 | 45.0 |

### Level of Service

| Traffic Volume (vph) | A | D | C | E | D | E | D | E | D |

### Approach Delay (s)

| Traffic Volume (vph) | 20.6 | 32.5 | 44.2 | 59.1 |

### Level of Service

| Traffic Volume (vph) | D | A | D | C | E | D | E | D | E |

### Intersection Summary

| Traffic Volume (vph) | 35.7 | HCM 2000 Level of Service | D |

### HCM 2000 Control Delay

| Traffic Volume (vph) | 0.71 |

### HCM 2000 Volume to Capacity ratio

| Traffic Volume (vph) | 0.088 |

### Actuated Cycle Length (s)

| Traffic Volume (vph) | 111.0 |

### Intersection Capacity Utilization

| Traffic Volume (vph) | 69.2% |

### Analysis Period (min)

| Traffic Volume (vph) | 15 |

### Critical Lane Group

| Traffic Volume (vph) | c |

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**AM Future 2035** Synchro 11 Report

**AM Future 2038** Synchro 11 Report
### Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR

<table>
<thead>
<tr>
<th>Lane Configurations</th>
<th>EBL</th>
<th>EBT</th>
<th>EBR</th>
<th>WBL</th>
<th>WBT</th>
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<th>NBL</th>
<th>NBT</th>
<th>NBR</th>
<th>SBL</th>
<th>SBT</th>
<th>SBR</th>
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<tbody>
<tr>
<td>Traffic Volume (vph)</td>
<td>107</td>
<td>253</td>
<td>12</td>
<td>25</td>
<td>678</td>
<td>185</td>
<td>4</td>
<td>25</td>
<td>72</td>
<td>383</td>
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<td>22</td>
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<td>25</td>
<td>678</td>
<td>185</td>
<td>4</td>
<td>25</td>
<td>72</td>
<td>383</td>
<td>2</td>
<td>22</td>
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<tr>
<td>Ideal Flow (vph)</td>
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<td>12</td>
<td>25</td>
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<td>185</td>
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<td>25</td>
<td>72</td>
<td>383</td>
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<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
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<td>1.00</td>
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<td>1770</td>
<td>5265</td>
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<td>Adj. Flow (vph)</td>
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<td>275</td>
<td>13</td>
<td>27</td>
<td>737</td>
<td>201</td>
<td>4</td>
<td>27</td>
<td>78</td>
<td>416</td>
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<td>24</td>
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<td>0</td>
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<td>42</td>
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<td>Lane Group Flow (vph)</td>
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<td>0</td>
<td>27</td>
<td>737</td>
<td>89</td>
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<td>Conf. Flow (vph/hr)</td>
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<td>2</td>
<td>8</td>
<td>27</td>
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<td>8</td>
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### Turn Type

<table>
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<th>Prot</th>
<th>Perm</th>
<th>Perm</th>
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<tbody>
<tr>
<td>Protected Phases</td>
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<td>Permitted Phases</td>
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### Actuated Green, G (s)

<table>
<thead>
<tr>
<th>Actuated Green, G (s)</th>
<th>14.8</th>
<th>82.1</th>
<th>2.9</th>
<th>70.2</th>
<th>70.2</th>
<th>58.1</th>
<th>58.1</th>
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</thead>
<tbody>
<tr>
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### Analysis Period (min)

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### Analysis Period (min)

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### Intersection Summary

- **PM Future 2026**
- **Synchro 11 Report**
- **Page 6**

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### Intersection Summary

- **PM Future 2026**
- **Synchro 11 Report**
- **Page 1**
### HCM Signalized Intersection Capacity Analysis

#### 8: Alea Access Rd & Moanalua Rd

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#### HCM Signalized Intersection Capacity Analysis

#### 9: McGrew Ln/Honomanu St & Kamehameha Hwy

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APPENDIX E
CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2026 PEAK PERIOD TRAFFIC ANALYSIS WITH PROJECT

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### Analysis Period (min) 15

#### Intersection Summary
- HCM 2000 Control Delay: 19.8
- HCM 2000 Level of Service: B
- HCM 2000 Volume to Capacity ratio: 0.95
- Actuated Cycle Length: 34.6
- Sum of lost time: 15.0
- Intersection Capacity Utilization: 61.5%
- ICU Level of Service: B
- HCM 2000 Level of Service: A
- Actuated Green: 4
- Effective Green: 4
- Actuated g/C Ratio: 1.00
- Clearance Time: 0.5
- Vehicle Extension: 3.0
- Lane Cap (vph): 3722
- v/s Ratio Prot: 0.14
- v/s Ratio Perm: 0.24
- v/c Ratio: 0.24
- Uniform Delay: 3.5
- Progression Factor: 1.00
- Incremental Delay: 0.0
- Delay: 3.6
- Level of Service: A
- Approach Delay: 0.0
- Analysis Period (min): 15

#### Critical Lane Group
- a. Critical Lane Group
- b. Critical Lane Group
- c. Critical Lane Group
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- RTOR Reduction (vph): 0
- Lane Group Flow (vph): 168
- Confl. Bikes (#/hr): 2
- Approach Delay (s): 5.2
- Approach Loss: A

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HCM Signalized Intersection Capacity Analysis
4: Kalaialoha St & Salt Lake Blvd
06/22/2020

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AM Future 2030 with Project
Synchro 11 Report
Page 4

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HCM Signalized Intersection Capacity Analysis
5: Kahuapaani St & Salt Lake Blvd
06/22/2020

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AM Future 2030 with Project
Synchro 11 Report
Page 5
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### Future Volume (vph) 41 210 406 782 266 396 51 205 610 69 334 17

### Total Lost time (s) 5.0 4.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0

### Lane Util. Factor 1.00 1.00 0.99 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

### Flt Protected 0.96 1.00 0.96 1.00 0.99 1.00 0.99 1.00 0.99 1.00 0.99 1.00

### Satll. Flow (pmh) 1781 1554 1762 1683 1769 3639 1534 1770 6408 1563

### Peak-hour factor, PHF 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88

### Adj. Flow (vph) 80 8 92 31 8 86 16 767 20 94 1419 9

### RTOR Reduction (vph) 0 0 74 0 0 69 0 0 11 0 0 4

### Lane Group Flow (vph) 0 97 18 0 38 17 16 767 9 94 1419 5

### Confl. Blows (vhr) 1 2

### Turn Type Perm NA Perm Perm NA Perm Prot NA Perm Prot NA Perm

### Protected Phases 6 6 2 2 2 4 4 8

### Actuated Green, G (s) 13.2 13.2 13.2 13.2 0.8 20.7 20.7 8.0 36.9 36.9

### Effective Green (s) 13.2 13.2 13.2 13.2 0.8 20.7 20.7 8.0 36.9 36.9

### Actuated g/C Ratio 0.20 0.20 0.20 0.20 0.16 0.45 0.45 0.12 0.56 0.56

### Clearance Time (s) 5.0 5.0 5.0 5.0 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 3.0 3.0 3.0 3.0

### Lane Grp Cap (vph) 266 311 280 313 21 1594 691 214 3588 888

### v/s Ratio Prot 0.07 0.07 0.05 0.05 0.05 0.05 0.01 0.01 0.01 0.01 0.01 0.01

### Actuated Delay, d1 22.7 21.3 21.7 21.3 32.5 12.7 10.0 28.9 8.2 6.4

### Progession Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

### Incremental Delay, d2 0.5 0.1 0.2 0.1 0.1 0.2 0.2 0.2 0.2 0.2 0.2 0.2

### Delay (s) 23.6 21.4 21.9 21.4 124.5 12.9 10.0 28.3 8.3 6.4

### Level of Service C C C C F B B C A A

### Approach LOS C C B A

### Intersection Summary

- **HCM 2000 Volume to Capacity ratio**: 0.72
- **Intersection Capacity Utilization**: 54.3%
- **Critical Lane Group**: c

### Analysis Period (min) 15

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**AM Future 2030 with Project**

**AM Future 2030 with Project**
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| Intersection Summary | | | | | | |
| HCM 2000 Control Delay | 34.3 | | | | | | |
| HCM 2000 Volume to Capacity Ratio | 0.89 | | | | | | |
| Actuated Cycle Length (s) | 111.5 | | | | | | |
| Intersection Capacity Utilization | 69.2% | | | | | | |
| Analysis Period (min) | 16 | | | | | | |

**Critical Lane Group**

---

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| Intersection Summary | | | | | | |
| HCM 2000 Control Delay | 69.2 | | | | | | |
| HCM 2000 Volume to Capacity Ratio | 0.89 | | | | | | |
| Actuated Cycle Length (s) | 111.5 | | | | | | |
| Intersection Capacity Utilization | 69.2% | | | | | | |
| Analysis Period (min) | 16 | | | | | | |

**Critical Lane Group**

---

**AM Future 2030 with Project**

**Synchro 11 Report**

Page 8
### HCM Signalized Intersection Capacity Analysis

**1: Kamehameha Hwy & Salt Lake Blvd**

**06/22/2020**

**Movement**

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<th>VAIL</th>
<th>WBR</th>
<th>NBR</th>
<th>SBL</th>
<th>SBT</th>
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**Futur Volume (vph)**

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<th>Nth</th>
<th>Sth</th>
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</table>

**Ideal Flow (vphpl)**

| 1900 | 1900 |

**Loss Time (s)**

| 5.0 | 5.0 |

**Utl Factor**

| 0.67 |

**Ftp, pathl**

| 1.00 |

**Ftp, existl**

| 1.00 |

**Fitted**

| 1.00 |

**Satf. Flow (prot)**

| 1900 | 1900 | 1900 | 1900 | 1900 |

**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 |

**Utl Factor**

| 0.95 |

**Ftp, pathl**

| 1.00 |

**Ftp, existl**

| 1.00 |

**Fitted**

| 1.00 |

**Satf. Flow (prot)**

| 1681 | 1720 | 1540 | 3433 | 5085 |

**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 | 5.0 | 5.0 | 5.0 | 5.0 |

**Satf. Flow (perm)**

| 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |

**Real-time Factor, PRI**

| 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |

**Adj. Flow (vph)**

| 265 | 1953 | 2229 | 0 | 0 | 748 |

**RTOR Reduction (vphpl)**

| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Lane Group Flow (vphpl)**

| 265 | 1953 | 2229 | 0 | 0 | 748 |

**Confl. Bikes (LFr)**

| 1 | 5 |

**Total:**

| 4 | 4 | 5 | 6 |

**Protected Phases:**

| 4 | 4 | 5 | 6 | 6 |

**Permitted Phases:**

| 2 | 2 |

**Actuated Green (G(s))**

| 40.2 | 50.2 | 59.0 | 69.0 | 69.0 | 69.0 | 69.0 | 69.0 |

**Effective Green (G(s))**

| 40.2 | 50.2 | 59.0 | 69.0 | 69.0 | 69.0 | 69.0 | 69.0 |

**Actuated g/C Ratio**

| 0.34 | 0.42 | 0.49 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 |

**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 Drop Cap (vphpl)**

| 1157 | 1173 | 2516 | 3706 | 3706 | 3706 | 3706 | 3706 |

**v/c Ratio Prot**

| 0.08 | 0.38 | 0.44 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |

**v/c Ratio Perm**

| 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |

**Uniform Delay, d1**

| 28.4 | 32.1 | 27.1 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 |

**Progression Factor**

| 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Intermittency Delay, d2**

| 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |

**Delay (s)**

| 28.5 | 41.4 | 31.2 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 |

**Level of Service**

| C | D | C | B | B | B | B | B |

**Approach Delay (s)**

| 38.8 | 31.2 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 |

**Approach LOS**

| D | C | B | B | B | B | B | B |

**Intersection Summary**

- **HCM 2000 Control Delay:** 30.2
- **HCM 2000 Volume to Capacity ratio:** 0.93
- **Actuated Cycle Length (s):** 119.2
- **Intersection Capacity Utilization:** 77.3%
- **Analysis Period (min):** 15
- **C:** Critical Lane Group

---

**PM Future 2036 with Project**

**Synchro 11 Report**

**Page 1**
### Movement: 3: Salt Lake Blvd

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### Intersection Summary

- **HCM 2000 Control Delay:** 4.8
- **HCM 2000 Level of Service:** A
- **HCM 2000 Volume to Capacity ratio:** 0.34

### Analysis Period (min): 15

### Critical Lane Group: E

---

### Movement: 4: Kalalau St & Salt Lake Blvd

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### Intersection Summary

- **HCM 2000 Control Delay:** 6.2
- **HCM 2000 Level of Service:** A
- **HCM 2000 Volume to Capacity ratio:** 0.45

### Analysis Period (min): 15

### Critical Lane Group: E
### Lane Configurations

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### Intersection Summary

- HCM 2000 Control Delay: 37.3
- HCM 2000 Volume to Capacity ratio: 0.67
- Actuated Cycle Length (s): 127.0
- Sum of lost time (s): 20.0
- Intersection Capacity Utilization: 82.1%
- ICU Level of Service: D

### Protected Phases

- 4 of 8
- 4 of 8
- 4 of 8
- 4 of 8
- 4 of 8
- 4 of 8

### Progression Factor

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### Intersection Summary

- **HCM 2000 Control Delay**: 42.0
- **HCM 2000 Level of Service**: D
- **HCM 2000 Volume to Capacity ratio**: 0.75
- **Actuated Cycle Length (s)**: 120.6
- **Sum of lost time (s)**: 20.0
- **Intersection Capacity Utilization**: 75.8%
- **ICU Level of Service**: D

**Analysis Period (s)**: 16

- Critical Lane Group

---

**PM Future 2020 with Project**

---

**PM Future 2020 with Project**
### Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR

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### Intersection Summary
- **HCM 2000 Control Delay**: 33.2
- **HCM 2000 Level of Service**: C
- **HCM 2000 Volume to Capacity ratio**: 0.96
- **Actuated Cycle Length (s)**: 151.3
- **Sum of lost time (s)**: 15.0
- **Intersection Capacity Utilization**: 83.3%
- **ICU Level of Service**: E
- **Analysis Period (min)**: 15

### APPENDIX F

#### CAPACITY ANALYSIS CALCULATIONS

##### TRANSIT LOS

- **Critical Lane Group**
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<th>Entire Eastern Hoy</th>
<th>Agreement and Hoy</th>
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<td>Average passenger trip length (min)</td>
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<td>Average traffic volume (veh/day)</td>
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<td>P_b</td>
<td>Percent stops in segment with a bus</td>
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<td>Are parking spaces occupied?</td>
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</tr>
<tr>
<td>i</td>
<td>Motorized vehicle speed adjustment factor</td>
<td>0.12</td>
<td>0.12</td>
<td>0.12</td>
</tr>
<tr>
<td>j</td>
<td>Motorized vehicle volume adjustment factor</td>
<td>0.04</td>
<td>0.72</td>
<td>0.93</td>
</tr>
<tr>
<td>k</td>
<td>Motorized vehicle volume adjustment factor</td>
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<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>l</td>
<td>Sidewalk width coefficient</td>
<td>4.50</td>
<td>4.50</td>
<td>4.50</td>
</tr>
<tr>
<td>m</td>
<td>Buffer area coefficient</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>n</td>
<td>Total width of outside lane, bike lane, and parking lane/shoulder (ft)</td>
<td>12.0</td>
<td>12.0</td>
<td>12.0</td>
</tr>
<tr>
<td>o</td>
<td>Effective total width and function of traffic volume (ft)</td>
<td>12.0</td>
<td>12.0</td>
<td>12.0</td>
</tr>
<tr>
<td>p</td>
<td>Effective width of combined bike lane and shoulder (ft)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>q</td>
<td>Cross-section adjustment factor</td>
<td>-0.15</td>
<td>4.85</td>
<td>-9.05</td>
</tr>
<tr>
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<td>Pedestrian environment score</td>
<td>2.15</td>
<td>2.53</td>
<td>2.36</td>
</tr>
<tr>
<td>s</td>
<td>Predictive LOS</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>t</td>
<td>Transit LOS</td>
<td>3.15</td>
<td>3.23</td>
<td>2.47</td>
</tr>
</tbody>
</table>

**Notes:**
- Calculation of Total Coverage Score (TCS)
- Calculation of Overall Coverage Score (OCS)
- Calculation of Minimum Coverage Score (MCS)
- Calculation of Maximum Coverage Score (MCS)
- Calculation of Average Coverage Score (ACS)
- Calculation of Standard Deviation (SDEV)
- Calculation of Coefficient of Variation (CV)
- Calculation of Median (MED)
- Calculation of Mode (MODE)
- Calculation of Range (RANGE)
- Calculation of Inter-Quartile Range (IQR)
- Calculation of Skewness (SKW)
- Calculation of Kurtosis (KRT)
- Calculation of Lognormality (LOG)
- Calculation of Normality (NRM)
- Calculation of Exponentiality (EXP)
- Calculation of Beta (BET)
- Calculation of Gamma (GAM)
- Calculation of Weibull (WBL)
- Calculation of Chi-Square (CHI)
- Calculation of Kolmogorov-Smirnov (KOL)
- Calculation of Anderson-Darling (AND)
- Calculation of Bootstrap (BSP)
- Calculation of Bootstrap strap (BST)
- Calculation of Bootstrap method (BMT)
- Calculation of Bootstrap sample (BSM)
- Calculation of Bootstrap confidence interval (BCI)
- Calculation of Bootstrap standard error (BSE)
- Calculation of Bootstrap standard deviation (BSD)
- Calculation of Bootstrap mean (BMN)
- Calculation of Bootstrap median (BMD)
- Calculation of Bootstrap mode (BMO)
- Calculation of Bootstrap range (BRG)
- Calculation of Bootstrap interquartile range (BIR)
- Calculation of Bootstrap skewness (BSK)
- Calculation of Bootstrap kurtosis (BKT)
- Calculation of Bootstrap lognormality (BLOG)
- Calculation of Bootstrap normality (BNSM)
- Calculation of Bootstrap exponentiality (BE)...
Appendix I:
Economic and Fiscal Impact Analysis
MARKET FEASIBILITY STUDIES & ECONOMIC IMPACT ANALYSIS FOR A NEW ALOHA STADIUM & ANCILLARY DEVELOPMENT DISTRICT

DRAFT REPORT v6 - OCTOBER 23, 2019

COVER LETTER

October 23, 2019

Stacey Jones
Owner/Senior Principal, Crawford Architects
1801 McGee Street, Suite 200, Kansas City, MO 64108

Dear Stacey:

Viclus Advisors is pleased to present this draft report to Crawford Architects regarding the market demand, financial feasibility, and economic impacts of a new Aloha Stadium and ancillary development district.

This document is organized into an Executive Summary followed by three primary reports (Sections A, B, and C). Section A features Viclus Advisors’ market and financial feasibility study for a new Aloha Stadium. For Section B, Viclus Advisors engaged RCLCO to complete a real estate market study for the proposed ancillary development surrounding the new Aloha Stadium. Lastly, Section C is an economic and fiscal impact analysis completed by Viclus Advisors based upon the market demand and programming assumptions developed by Viclus Advisors and RCLCO in Sections A and B.

Please note that this draft report relies on a variety of information and assumptions to develop market, financial, and economic projections. Sources of information and assumptions include but may not be limited to, information provided by Crawford Architects, WT Partnership, and the State of Hawaii/Aloha Stadium; input and opinions provided by relevant third parties and other potential project stakeholders; the collective industry experience and previous studies of Viclus Advisors and RCLCO; and publicly available data from various industry sources. Any such information collected by Viclus Advisors or RCLCO has not been audited or verified and has been assumed to be correct. There will be differences between actual events and projections contained herein, and these differences may be material. We express no assurances of any kind related to any projected information.

Sincerely,

Brian Connolly
Founder & Principal, Viclus Advisors LLC
2720 Homestead Road, Suite 130, Park City, UT 84098 // Phone: (435) 604-0874 // Email: info@victusadvisors.com
PROJECT BACKGROUND

Victus Advisors was engaged by Crawford Architects in June 2019 to conduct an independent, objective, and research-based study of the market and financial feasibility for a replacement of Aloha Stadium, as well as the potential economic and fiscal impacts that could be generated by a new Aloha Stadium and adjacent ancillary development (residential, retail, office, hotel, etc.). Victus Advisors has also sub-contracted with RCLCO to develop a market feasibility analysis for ancillary development adjacent to the new stadium, and RCLCO’s report has been presented following this stadium feasibility study. Lastly, Victus Advisors also completed a separate economic and fiscal impact analysis that is based upon the combined stadium and ancillary development demand assumptions collectively developed by Victus Advisors and RCLCO.

STADIUM STUDY GOALS

For the stadium market feasibility study, Victus Advisors’ study goals include but are not limited to:

• Estimate market demand for a new Aloha Stadium (events, attendance, etc.)
• Recommend a market-supportable building program (seating capacity, premium areas, etc.)
• Project the potential incremental revenues/expenses of a new stadium

HISTORICAL STADIUM ANALYSIS

Annual Event Activity - Aloha Stadium has averaged 54 in-stadium sports events per year over the past five years, including youth football, college football, and professional soccer and rugby. In the same time frame, Aloha Stadium has averaged 252 other non-field sports events per year, many of which occur outside of the stadium (such as swap meets, the State Fair, car shows, running events).

Annual Event Income - FY 2019 was Aloha Stadium’s best year in terms of event income over the last five years. Non-sports events and shows account for 81% of income generated from events (over a five-year average), primarily because of the Swap Meet. Total event income increased by over 45% in fiscal year 2019 from fiscal year 2018, due in large part to new concert activity being held in Aloha Stadium.

Stadium Authority Financials - Stadium Authority operating income (and operating margin) was at its highest in fiscal year 2019. This is due in large part to seven (7) concerts being held at the stadium that year, compared to minimal concert activity in previous years.

Recent Concert Activity - Aloha Stadium staff have made a concerted effort in recent years to attract more concert activity. Concert promoters also indicated that previous large concerts held at Aloha Stadium show that the market has the potential to support stadium concert activity and that a new stadium with proper staging, rigging, power, and other modern amenities should not have problems attracting large acts in Hawaii.
EXECUTIVE SUMMARY (CONT.)

DEMOGRAPHIC STUDY & COMPARABLE MARKET ANALYSIS

Honolulu Metropolitan Statistical Area (MSA) Demographics - The Honolulu MSA is the 56th largest MSA in the country, surpassing the MSA’s of Omaha NE, Albuquerque NM, Knoxville TN, and Baton Rouge LA, among others. The Honolulu MSA compares favorably to national averages when it comes to household income levels, the median age of the population, and the presence of working families with children. However, due to the high cost of living on the island, household incomes actually fall below the national average when adjusted for living costs.

Comparative Markets - For the purposes of comparative markets, we examined market areas with a stadium that has a primary college football tenant that tends to drive major revenue streams such as premium seating, corporate sponsorships, etc.:

- Albuquerque, NM MSA (University of New Mexico)
- Boise, ID MSA (Boise State University)
- Cheyenne, WY MSA (University of Wyoming)
- Colorado Springs, CO MSA (Air Force Academy)
- Fort Collins, CO MSA (Colorado State University)
- Fresno, CA MSA (Fresno State University)
- Las Vegas, NV MSA (University of Nevada-Las Vegas)
- Logan, UT MSA (Utah State University)
- Reno, NV MSA (University of Nevada)
- San Jose, CA MSA (San Jose State University)
- San Diego, CA MSA (San Diego State University)

Population - The Honolulu MSA’s population of over one million people represents the fourth most populated out of the 12 markets selected for comparative analysis.

Population Growth - The Honolulu MSA ranks last in terms of projected annual growth amongst comparative markets.

Median Age - The Honolulu MSA has the highest median age amongst comparative markets, indicating an older market that could have a larger presence of retirement aged individuals who often have smaller disposable income budgets and partake in a more limited range of entertainment options.

Adjusted Household Income - When adjusted for cost of living, the Honolulu MSA’s median household income ranks last among comparable stadium markets. Relative to other large markets, this data indicates that Honolulu MSA households may have less discretionary income for entertainment spending.

High Income Households - The Honolulu MSA ranks fourth among comparable stadium markets in terms of households with income over $150,000. Households with higher income levels could have more disposable income for sports and entertainment events.

Corporate Base - Among comparable markets, the Honolulu MSA has the fifth largest corporate base, indicating that the market has solid potential for businesses to purchase event tickets, premium seating amenities, and sponsorship opportunities.

EXECUTIVE SUMMARY (CONT.)

COMPARABLE STADIUM CASE STUDIES

Overview - Victus also analyzed the stadiums that currently are or will be the home venue for Mountain West Conference (MWC) football programs follows:

- Albertsons Stadium (Boise State University)
- Allegiant Stadium (University of Nevada-Las Vegas)
- Bulldog Stadium (Fresno State University)
- Canvas Stadium (Colorado State University)
- CEFCU Stadium (San Jose State University)
- Dreamstyle Stadium (University of New Mexico)
- Falcon Stadium (Air Force Academy)
- Mackay Stadium (University of Nevada)
- Maverik Stadium (Utah State University)
- SDCCU Stadium (San Diego State University)
- New San Diego Stadium (San Diego State University)
- War Memorial Stadium (University of Wyoming)

Comparable Stadium Summary -

- Location - All but three MWC stadiums are on university campuses.
- Construction Cost - Construction/renovation costs for most MWC stadiums ranged between $16 million and $250 million in 2019 dollars.
- Ancillary Development - The new San Diego Stadium is the only stadium that is currently planned as the anchor of an off-campus ancillary development district.

EVENT PROMOTER INTERVIEWS SUMMARY

Overview - Victus Advisors conducted telephone interviews with a variety of operators, promoters, and influencers of sports and entertainment events. Interviews were conducted to gather opinions and insights directly from the potential users of a new Aloha Stadium, such as AEG, Feld Entertainment, Grand Pacific Events, Hawaii Tourism Authority, LiveNation, and World Fighting Championships.

Interview Key Takeaways - Feedback from interviews indicated that many events would be interested in utilizing a newly-built Aloha Stadium if the proper amenities were included in the new construction. Interviewees said that a new stadium with no more than 35,000 fixed seats would have adequate seating for their events. Below is a summary of the key takeaways from each event type:

- Concerts - Rigging grid system on-site, updated dressing rooms for acts, proper venue exits for field seats, additional operations staff dedicated to event services, and diverse premium seating options: suites, loge boxes, group seating for all sizes.
- Motor Sports - Adequate field access for equipment, large event space outside of the stadium for pre-event activities, premium seating: access to suites/boxes for corporate sponsors, and financial support from CVB and/or tourism authority
- Rugby/Soccer - Adequate field size, multiple locker rooms, and premium seating: suites/boxes located on sideline rather than end zone.
### EXECUTIVE SUMMARY (CONT.)

#### STADIUM EVENT & ATTENDANCE PROJECTIONS

**Aloha Utilization Estimates** - Based upon the historical analysis, demographic and market analysis, interviews with event organizers/promoters, and Victus Advisors' industry expertise, it is conservatively estimated that a new Aloha Stadium could host approximately 305 events per year, with an estimated attendance of over 1.8 million. With a new Aloha Stadium, we have estimated that the Honolulu market could capture at least 10 new major sports and entertainment events each year (concerts, soccer, rugby, motor sports, etc.), beyond the existing event activity that occurred at Aloha Stadium in FY 2019.

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Event Days</th>
<th>Average Attendees per Event</th>
<th>Total Attendances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Events (Historical)</td>
<td>1</td>
<td>15,736</td>
<td>15,736</td>
</tr>
<tr>
<td>Sports Events</td>
<td>52</td>
<td>6,127</td>
<td>318,604</td>
</tr>
<tr>
<td>Concerts</td>
<td>7</td>
<td>30,198</td>
<td>211,383</td>
</tr>
<tr>
<td>Swap Meet</td>
<td>153</td>
<td>6,725</td>
<td>1,028,592</td>
</tr>
<tr>
<td>Other Events &amp; Shows (Graduations, Parades, etc.)</td>
<td>82</td>
<td>1,301</td>
<td>106,710</td>
</tr>
<tr>
<td><strong>Total Annual</strong></td>
<td>295</td>
<td>5,700</td>
<td>1,681,388</td>
</tr>
</tbody>
</table>

**New Events**
- Concerts & Entertainment Acts: 3 events, 25,000 attendees, 75,000 total attendees.
- Sports Events (Soccer, Rugby, Motor Sports, etc.): 7 events, 15,000 attendees, 105,000 total attendees.

**New Grand Total**
- 305 events, 6,103 average attendees, 1,841,388 total attendees.

---

#### STADIUM PROGRAM RECOMMENDATIONS

**Overview** - Our facility recommendations for a new Aloha Stadium are based primarily upon the following primary and secondary research conducted by Victus Advisors over the course of this study:

- Analysis of Honolulu's unique market characteristics
- Review of comparative markets and facilities
- Interviews conducted with event organizers and operators

**Recommended Stadium Program** - The State of Hawaii should consider the development of a new Aloha Stadium. Based upon the results of our market and facility analysis, Victus Advisors recommends that a new Aloha Stadium should have:

- Approximately 35,000 fixed seats
- Significant consideration should be given to designing the seating bowl, stage configuration, lighting and electrical, and rigging capacities to drive maximum value for concert and entertainment performances.
- Private Suites: 20 suites with 16 seats each
- Party Suites: 2 suites with 30 seats each
- Loge Boxes: Approximately 200 loge boxes (in a configuration of approximately 40 loge boxes with either 4 or 6 seats per box)
- Club Seats: 1,200 club seats and a Club Lounge

In order to accommodate international soccer and rugby events, in addition to football, the field dimensions should be at least 120 yards long by 80 yards wide.

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#### STADIUM OPERATING REVENUE & EXPENSE PROJECTIONS

**Financial Projections** - In a stabilized year of operations, it is estimated that the operations of a new Aloha Stadium could generate approximately $11.1 Million in annual net operating income after funding for a long-term capital reserve and prior to any revenue sharing with the stadium’s primary tenant. Based upon our industry experience, it should be noted that it is possible that several of the new revenue streams could be shared with the primary tenant, such as stadium naming rights, advertising & sponsorships, and luxury seating premiums.

**FY 2019**

<table>
<thead>
<tr>
<th>Revenue</th>
<th>Aloha Stadium</th>
<th>Increase from New Aloha Stadium</th>
<th>New Aloha Stadium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swap Meet (n)</td>
<td>$4,269,059</td>
<td>$0</td>
<td>$4,269,059</td>
</tr>
<tr>
<td>Parking (net)</td>
<td>$1,904,311</td>
<td>$276,000</td>
<td>$2,180,311</td>
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<tr>
<td>Food &amp; Beverage (net)</td>
<td>$2,323,605</td>
<td>$714,540</td>
<td>$3,038,145</td>
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<tr>
<td>Rent</td>
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<td>$202,000</td>
<td>$1,971,753</td>
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<tr>
<td>Stadium Naming Rights (net)</td>
<td>$0</td>
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<tr>
<td>Advertising &amp; Sponsorships (net)</td>
<td>$451,854</td>
<td>$1,373,136</td>
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<tr>
<td>Interest</td>
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<td>$0</td>
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<tr>
<td>Luxury Seating Premiums (net)</td>
<td>$0</td>
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<tr>
<td>Stadium Taxis</td>
<td>$498</td>
<td>$0</td>
<td>$498</td>
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<tr>
<td>Miscellaneous</td>
<td>$225,810</td>
<td>$0</td>
<td>$225,810</td>
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<tr>
<td><strong>Total - Net Revenue:</strong></td>
<td>$10,284,700</td>
<td>$9,372,954</td>
<td>$19,657,654</td>
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</table>

<table>
<thead>
<tr>
<th>Expenses:</th>
<th>Aloha Stadium</th>
<th>Increase from New Aloha Stadium</th>
<th>New Aloha Stadium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel Services</td>
<td>$4,671,210</td>
<td>$34,670</td>
<td>$4,805,880</td>
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<tr>
<td>Supplies</td>
<td>$299,098</td>
<td>$20,900</td>
<td>$320,098</td>
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<tr>
<td>Utilities</td>
<td>$1,071,024</td>
<td>$(107,102)</td>
<td>$963,922</td>
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<td>Repairs &amp; Maintenance</td>
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<td>$(71,407)</td>
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<td>Services Of A-Few Basis</td>
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<td>$517,000</td>
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<tr>
<td>Central Services Assessment</td>
<td>$305,200</td>
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<td>$270,600</td>
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<td>Miscellaneous</td>
<td>$223,070</td>
<td>$(22,200)</td>
<td>$200,870</td>
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<tr>
<td><strong>Total - Expenses:</strong></td>
<td>$7,687,250</td>
<td>$(576,381)</td>
<td>$7,110,869</td>
</tr>
</tbody>
</table>

**Net Operating Income:**

$1,597,450

**Less: Annual Capital Reserve:**

$(5,429,800)

**NI: After Capital Reserve:***

$1,170,050

*Draft - Subject to Change*
EXECUTIVE SUMMARY (CONT.)

RLC Co - Strategic Real Estate Market Analysis

Site Assessment -

- The subject site reflects a unique opportunity to create a vibrant and dynamic mixed-use district anchored by the redeveloped Aloha Stadium.
- The site can draw from the strong existing characteristics of a local market benefitting from proximity to Pearl Harbor and future transit access. The stadium can serve as the key anchor to catalyze growth, create a market, and enable attractive pricing, positioning, and absorption that would otherwise not be feasible without the stadium anchor.
- Phase I is critical to defining the project’s vision and character, and laying the foundation for long-term success across multiple phases. A well-balanced mix of uses, outlined below, can leverage the stadium’s magnetism to attract a critical mass and define the district as one of Oahu’s premier living, dining/shopping, and tourism destinations.

Phase I Opportunity: Retail -

- Existing retail in the local area predominantly serves local households and employees, and not the broader tourist market. Notable clusters of retail include the Pearlridge Shopping Center, a 1.1 million square foot super-regional mall featuring midrange boutiques and national chains. While still boasting low vacancy (4%) and strong rents ($3.40/SF/month NNN), the Leeward Honolulu submarket lags behind the more tourist-serving Central Honolulu submarket.

Phase I Opportunity: Apartments -

- Despite strong underlying fundamentals, the local submarket is supply-constrained, with no new supply additions in decades.
- Given the site’s high-density, mixed-use character, there is a strong opportunity for the site to tap into the submarket’s pent-up demand and deliver new, high-quality apartments that appeal to young and mature professionals, lifestyle renters-by-choice, and military households.
- We estimate achievable pricing of $2,875 for an average-sized, 810-square foot unit, or $3.55 per square foot.
- We recommend delivering 325 total apartment units beginning in year one of Phase I, to be absorbed over three years.
- We estimate a total market value of $215.8 million for the apartments, and a residual land value of $15.1 million, including the value of ground-floor retail space.

Phase I Opportunity: Conventional Condominiums -

- There is strong demand across Oahu, and within urban locations, for conventional for-sale product that appeals to primary homebuyers, including singles, couples, and families, rather than to a high-end or second-home buyer. The local Leeward Honolulu submarket, in particular, is a strong existing destination for conventional housing, with demonstrated demand for condominiums at more reasonable price points. The existing supply is predominantly older in age, and is characterized by apartment-quality finishes and minimal

A vibrant and exciting retail destination is a crucial part of the site’s success, helping to create an attractive destination that not only serves local and onsite households/employees and visitors to the stadium, but that also draws in tourists and households from across the Island that may not have otherwise considered visiting the submarket.

- We recommend programming up to 250,000 net square feet of retail space by year four of Phase I, including a grocer, several restaurants, a small selection of hard and soft goods boutiques, and significant entertainment/services. We estimate monthly NNN rents of $5.00 per square foot, above rates for local-serving spaces in Leeward Honolulu but at a discount to the top retail spaces in Waikiki.
- Of the recommended retail space, 84,000 net square feet should be programmed as ground-floor mixed-use space within larger scale development projects and included in the evaluation of value for those developments.
- The value of the remaining 166,000 net square feet of retail space, to be spread across the rest of Phase I, would have a market value of $183.6 million and residual land value of $27.9 million.

Phase I Opportunity: Premium Condominiums -

- Premium condominium product on Oahu is predominantly clustered in Waikiki, Kaka’ako, and Ala Moana, and achieves extremely high price points by targeting international second-home buyers. The local submarket is not an established premium condominium market, with the majority of residential product appealing to local, non-premium buyers at a relatively low-density. However, as a mixed-use, stadium-anchored development, the site has a unique opportunity to attract local and mainlander premium buyers who would be interested in owning a unit in a vibrant and exciting, stadium-anchored development.
- We recommend pricing premium condos at a steep discount to new product in Waikiki, Kaka’ako, and Ala Moana. Premium condos at the site could achieve average pricing of $1.2 million for an average unit size of 1,010 square feet ($1,180 per square foot).

The site has an attractive opportunity to deliver conventional condominiums targeted to non-high-end households. We recommend average pricing of approximately $590k, given an average unit size of 750 square feet ($785 per square foot).

- We recommend delivering 225 units, beginning in Phase I, to be absorbed over three years.
- We estimate a total market value of $161.8 million for the conventional condos, and a residual land value of $18.6 million, including the value of ground-floor retail space.

Phase I Opportunity: Premium Condominiums -

- Premium condominium product on Oahu is predominantly clustered in Waikiki, Kaka’ako, and Ala Moana, and achieves extremely high price points by targeting international second-home buyers. The local submarket is not an established premium condominium market, with the majority of residential product appealing to local, non-premium buyers at a relatively low-density. However, as a mixed-use, stadium-anchored development, the site has a unique opportunity to attract local and mainlander premium buyers who would be interested in owning a unit in a vibrant and exciting, stadium-anchored development.
- We recommend pricing premium condos at a steep discount to new product in Waikiki, Kaka’ako, and Ala Moana. Premium condos at the site could achieve average pricing of $1.2 million for an average unit size of 1,010 square feet ($1,180 per square foot).
EXECUTIVE SUMMARY (CONT.)

STRATEGIC REAL ESTATE MARKET ANALYSIS (CONT.)

Phase I Opportunity: Premium Condominiums (Cont.)

- We recommend delivering 150 premium condos, beginning in year three, when leading uses at the site have begun to stabilize and the overall project has established a strong brand, sense of place, and critical mass.
- We estimate the premium condominiums to have a total market value of $195.9 million and a residual land value of $21.8 million, including the value of ground-floor retail space.

Phase I Opportunity: Office -

- The Leeward Honolulu submarket is one of the more attractive office locations across Oahu, consistently outperforming the CBD in top tenant attraction, rents, and occupancy.
- However, the office market on Oahu faces several headwinds, including the relatively moderate job growth in the Honolulu MSA compared to other major metros nationally, the large volume of existing supply and underutilized office spaces, and the absence of a significant number of major employers that demand large spaces. These factors coalesce to temper the overall potential for office space at the site, relative to other uses; we estimate market support for up to 100,000 square feet of office space in Phase I.

- Although office space does not generate a significantly positive residual land value (see below), we believe the presence of office space at the subject site adds value to complementary uses by creating a stronger and comprehensive live/work/play environment. We therefore recommend that office space be value-engineered to be financially feasible, such as by configuring it on the lower floors of mixed-use buildings (e.g., residential or hotel) in order to lower construction costs and result in better integration among the different uses.
- We recommend programming 75,000 square feet of office, slightly less than what the market could support, given both the lower land values for office space relative to other uses, as well as the fact that the demand for this type of office space in Honolulu is concentrated for tenants that typically require smaller office spaces. This increases the overall number of leases that need to be signed and could potentially complicate the site’s absorption.
- We estimate that 75,000 net square feet of office space would have a market value of $73.3 million, but a residual land value that is almost neutral, at $887,000. Nonetheless, the inclusion of office would lead to higher land values for the complementary uses.

EXECUTIVE SUMMARY (CONT.)

STRATEGIC REAL ESTATE MARKET ANALYSIS (CONT.)

Phase I Opportunity: Hotel -

- Oahu continues to be one of the most attractive and healthy hotel markets in the country, driven by the vast draw of Hawaii’s natural beauty and lifestyle amenities. Within Oahu, Waikiki is the preferred hotel submarket, but other resort areas with unique amenities or activities are becoming increasingly viable hotel destinations that offer a value alternative to Waikiki. While Leeward Honolulu is not a particularly desirable hotel submarket, the mixed-use subject site could significantly alter the area’s desirability from a hospitality perspective.
- We believe that a hotel use would be an excellent fit within Phase I of the project, both drawing from and contributing to the vibrancy of the sports-anchored mixed-use district. In particular, a hotel at the site could serve the over 1.5 million annual visitors to the stadium; further, the project overall could serve as a significant catalyst for growth in visitation, attracting tourists and visitors to the site’s retail and mixed-use district who would otherwise not have considered visiting Leeward Honolulu.
- In light of these trends, our demand analysis suggests support for up to 240 hotel rooms at the project in Phase I. We recommend delivering the hotel in year three, as the residential and retail uses have begun to stabilize and establish the site’s character and sense of place. We estimate an achievable ADR of $350 for an upper midscale and higher hotel flag, at a discount to Waikiki but above existing hotels in the local area.

- From a financial perspective, we estimate the hotel to have a market value of $154.6 million, and a residual land value of $36.9 million.

Summary of Recommended Phase I & Full Build-Out Real Estate Development Programs -

RCLCO recommends a Phase I development program (assumed to be completed within five years) of nearly 1.24 million gross square feet. At full build-out (approximately 15 years), RCLCO estimates a total of approximately 3.2 million gross square feet of development, including a total of 1,813 residential units, 216,000 gross square feet of office, 68,500 gross square feet of retail, and 621 hotel keys at full build-out.

<table>
<thead>
<tr>
<th>LAND USE</th>
<th>PHASE I</th>
<th>THROUGH BUILD-OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartments (Units)</td>
<td>225</td>
<td>567</td>
</tr>
<tr>
<td>Condos - Conventional (Units)</td>
<td>225</td>
<td>582</td>
</tr>
<tr>
<td>Condos – Premium (Units)</td>
<td>150</td>
<td>380</td>
</tr>
<tr>
<td>Retail (Ex. Ground Floor) (Gross SF)</td>
<td>283,500</td>
<td>283,500</td>
</tr>
<tr>
<td>Office (Gross SF)</td>
<td>63,500</td>
<td>216,500</td>
</tr>
<tr>
<td>Hotel (Gross SF)</td>
<td>240</td>
<td>621</td>
</tr>
<tr>
<td>Total Gross SF</td>
<td>1,258,580</td>
<td>3,250,684</td>
</tr>
</tbody>
</table>

Note: Full Build-Out Square include Phase I
EXECUTIVE SUMMARY (CONT.)

VICTUS ADVISORS - ECONOMIC & FISCAL IMPACT ANALYSIS

Assumptions -

- **Construction Impacts** - The building programs and construction cost estimates used in this analysis were developed by Crawford Architects (stadium) and RCLCO (mixed-use development), as shown below. It is assumed that full build-out total of over 3.8 million gross square feet could occur within approximately 15 years of the opening of a new Aloha Stadium.

<table>
<thead>
<tr>
<th>Type</th>
<th>Full Build-Out Gross Sq. Ft.</th>
<th>Full Build-Out Estimated Cost</th>
<th>Full Build-Out Est. Construction Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail</td>
<td>1,550,000</td>
<td>$864,386,000</td>
<td>$255,500,000</td>
</tr>
<tr>
<td>Residential</td>
<td>400,000</td>
<td>$238,777,462</td>
<td>$66,500,000</td>
</tr>
<tr>
<td>Office</td>
<td>50,000</td>
<td>$83,294,502</td>
<td>$24,000</td>
</tr>
<tr>
<td>Hotel</td>
<td>100,000</td>
<td>$88,767,837</td>
<td>$24,500</td>
</tr>
<tr>
<td>Total</td>
<td>2,100,000</td>
<td>$1,086,458,961</td>
<td>$354,500,000</td>
</tr>
</tbody>
</table>

Note: Full Build-Out figures include Phase 1

- **Operational Impacts** - Operational estimates (usage, visitation, revenues, expenses) for the new stadium and ancillary development were developed by Vinctus Advisors.

**One-time Fiscal Impacts of Construction** - It is estimated that construction of a new Aloha Stadium and ancillary development at full build-out could generate over $16.7 million in state and local general excise tax revenues, via direct ancillary development construction spending and indirect/induced spending associated with stadium construction.

**Annual Economic & Fiscal Impacts of Stadium Operations** - It is estimated that ongoing operations of a new Aloha Stadium could annually generate economic impacts of more than $40 million in net total output, 500 net annual jobs, and nearly $14.6 million in net annual wages in Oahu/Honolulu County; as well as annual fiscal impacts of over $1.1 million in net new tax revenues.

**Annual Economic & Fiscal Impacts of Ancillary Development Operations** - It is estimated that ancillary development operations (retail, residential, office, hotel) at full build-out could annually generate economic impacts of more than $79 million in net total output, 690 net annual jobs, and $28.8 million in net annual wages in Oahu/Honolulu County; as well as annually generate over $27 million in net new tax revenues at full build-out.

**Combined Impacts Over 25 Years** - It is estimated that a new Aloha Stadium and ancillary development could generate combined net impacts over a period of 25 years with a net present value (NPV) of over $1.8 billion in net economic output, more than $700 million in personal earnings, over $198 million in incremental state and local tax revenues, and up to 1,190 new net annual jobs.
1. INTRODUCTION

PROJECT BACKGROUND

Victus Advisors was engaged by Crawford Architects in June 2019 to conduct an independent, objective, and research-based study of the market and financial feasibility for a replacement of Aloha Stadium, as well as the potential economic and fiscal impacts that could be generated by a new Aloha Stadium and adjacent ancillary development (residential, retail, office, hotel, etc.).

This report represents Victus Advisors’ market and financial feasibility analysis for the new stadium alone. Victus Advisors has also sub-contracted with RCLCO to develop a market feasibility analysis for ancillary development adjacent to the new stadium, and RCLCO’s report has been presented following this stadium feasibility study. Lastly, Victus Advisors also completed a separate economic and fiscal impact analysis that is based upon the combined stadium and ancillary development demand assumptions collectively developed by Victus Advisors and RCLCO.

For this stadium market feasibility study, Victus Advisors’ study goals include but are not limited to:

- Estimate **market demand** for a new Aloha Stadium (events, attendance, etc.)
- Recommend a market-supportable **building program** (seating capacity, premium areas, etc.)
- Project the potential incremental **revenues/expenses** of a new stadium
OVERVIEW

This section is intended to provide an analysis of the recent operations of Aloha Stadium. Therefore this section includes:

- Attendance Figures
- Event History
- Financials
- Premium Seating Options
- Missed Opportunities

The results of this analysis will be used to determine ideal seating capacity, future potential tenants and events, target consumers, and more.

ALOHA STADIUM

- Opened: 1975; Renovated: 2001
- Original Construction Cost: $37M ($213.9M in 2019 dollars*)
- Renovation Costs: Over $90M since 1990
- Owner: State of Hawaii
- Operator: Hawaii Stadium Authority
- Capacity: 50,000
- Tenants: University of Hawaii (UH) Football, Hawaii Bowl
- Events & Attendance (FY 2019):
  - 295 unique events (1,681,407 total attendees)
  - 52 in-stadium sports events (318,642 total attendees)
  - 153 swap meets (1,028,936 total attendees)
  - 7 concerts (211,383 total attendees)
  - 83 other events/shows (122,446 total attendees)
- Premium Seating Amenities:
  - 6 sky box rooms (2 available at $6,000/$5,000)
  - 2 VIP field suites ($3,000 each)
  - 2 loge areas ($4,800 each)
ANNUAL EVENT ACTIVITY

<table>
<thead>
<tr>
<th></th>
<th>FY2015</th>
<th>FY2016</th>
<th>FY2017</th>
<th>FY2018</th>
<th>FY2019</th>
<th>5 YEAR AVG.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IN-STADIUM SPORTS EVENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior Prep Sports America</td>
<td>8</td>
<td>3</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Interscholastic League of Hawai'i Football</td>
<td>8</td>
<td>10</td>
<td>13</td>
<td>9</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Pop Warner</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>University of Hawai'i Football</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Other (Football, Rugby, Soccer, etc.)</td>
<td>22</td>
<td>31</td>
<td>18</td>
<td>27</td>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total - Sports:</strong></td>
<td>50</td>
<td>57</td>
<td>54</td>
<td>59</td>
<td>52</td>
<td>54</td>
</tr>
<tr>
<td><strong>OTHER EVENTS &amp; SHOWS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swap Meets*</td>
<td>153</td>
<td>155</td>
<td>153</td>
<td>155</td>
<td>153</td>
<td>154</td>
</tr>
<tr>
<td>50th State Fair*</td>
<td>24</td>
<td>20</td>
<td>17</td>
<td>19</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>Sports Car Club of America*</td>
<td>16</td>
<td>14</td>
<td>21</td>
<td>15</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Runs*</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Concerts</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Other (Graduations, Parties, etc.)</td>
<td>61</td>
<td>67</td>
<td>66</td>
<td>47</td>
<td>43</td>
<td>57</td>
</tr>
<tr>
<td><strong>Total - Other Events &amp; Shows:</strong></td>
<td>259</td>
<td>259</td>
<td>259</td>
<td>239</td>
<td>243</td>
<td>252</td>
</tr>
<tr>
<td><strong>TOTAL EVENT DAYS:</strong></td>
<td>309</td>
<td>316</td>
<td>313</td>
<td>298</td>
<td>295</td>
<td>306</td>
</tr>
</tbody>
</table>

Source: Aloha Stadium Authority

Note: Only includes revenue-generating events

(*) Events held outside stadium in parking lot

Aloha Stadium has averaged 54 in-stadium sports events per year over the past five years, including youth football, college football, and professional soccer and rugby. In the same time frame, Aloha Stadium has averaged 252 other non-field sports events per year, many of which occur outside of the stadium (such as swap meets, the State Fair, car shows, running events, etc.)

IN-STADIUM ATTENDANCE BY USER GROUP

<table>
<thead>
<tr>
<th>FY 2019 AVERAGE IN-STADIUM ATTENDANCE BY USER GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concerts: 35,000</td>
</tr>
<tr>
<td>Hawai'i Bowl: 30,000</td>
</tr>
<tr>
<td>UH Football: 25,000</td>
</tr>
<tr>
<td>Other Football: 20,000</td>
</tr>
<tr>
<td>Graduations: 15,000</td>
</tr>
</tbody>
</table>

Source: Aloha Stadium Authority

Note: (1) Only includes events that averaged over 5,000 people per event (2) The Hawai'i Bowl is a once a year event

Before FY 2018, Aloha Stadium did not hold any in-stadium concert activity. However, in the most recent operating year, concerts generated the highest average attendance of any Aloha Stadium event type.
Over the last five seasons, University of Hawaii Football has averaged just under 25,000 spectators. The highest attended game was 36,411 people for the 2014 home opener, however the remainder of all UH football games has ranged between approximately 20,000 and 31,000 attendees.

ANNUAL EVENT INCOME

<table>
<thead>
<tr>
<th></th>
<th>FY2015</th>
<th>FY2016</th>
<th>FY2017</th>
<th>FY2018</th>
<th>FY2019</th>
<th>5 YEAR AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN-STADIUM SPORTS EVENTS INCOME:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior Prep Sports America</td>
<td>$23,433</td>
<td>$17,969</td>
<td>$40,491</td>
<td>$51,029</td>
<td>$52,862</td>
<td>$38,957</td>
</tr>
<tr>
<td>Interscholastic League of Hawaii Football</td>
<td>$90,651</td>
<td>$120,751</td>
<td>$188,582</td>
<td>$137,741</td>
<td>$82,828</td>
<td>$124,111</td>
</tr>
<tr>
<td>Pop Warner</td>
<td>$22,650</td>
<td>$22,314</td>
<td>$20,241</td>
<td>$21,645</td>
<td>$17,275</td>
<td>$20,821</td>
</tr>
<tr>
<td>University of Hawaii Football</td>
<td>$888,035</td>
<td>$736,935</td>
<td>$776,594</td>
<td>$747,857</td>
<td>$1,027,717</td>
<td>$831,428</td>
</tr>
<tr>
<td>Other (Football, Rugby, Soccer, etc.)</td>
<td>$258,189</td>
<td>$405,933</td>
<td>$460,267</td>
<td>$427,092</td>
<td>$515,304</td>
<td>$423,362</td>
</tr>
<tr>
<td><strong>Total - Sports:</strong></td>
<td><strong>$1,262,958</strong></td>
<td><strong>$1,353,908</strong></td>
<td><strong>$1,495,175</strong></td>
<td><strong>$1,385,334</strong></td>
<td><strong>$1,695,968</strong></td>
<td><strong>$1,438,869</strong></td>
</tr>
</tbody>
</table>

| OTHER EVENTS & SHOWS INCOME: |         |         |         |         |         |            |
| Swap Meets* | $4,631,934 | $4,444,789 | $4,710,915 | $4,933,322 | $4,579,941 | $4,660,180 |
| 50th State Fair* | $293,707 | $280,096 | $288,905 | $292,372 | $310,676 | $290,271 |
| Sports Car Club of America* | $12,000 | $10,500 | $21,000 | $15,000 | $17,000 | $15,100 |
| **Total - Other Events & Shows:** | **$5,130,834** | **$5,049,645** | **$5,389,861** | **$5,695,415** | **$8,660,370** | **$5,985,228** |

| **TOTAL EVENT INCOME:** | **$6,393,688** | **$6,403,553** | **$6,885,036** | **$7,080,749** | **$10,356,338** | **$7,423,097** |
| **% INCREASE FROM PREVIOUS YEAR** | - | 0% | 8% | 3% | 46% | - |

Source: Aloha Stadium Authority
Note: (*) Events held outside stadium in parking lot

FY 2019 was Aloha Stadium’s best year in terms of event income over the last five years.

Non-sports events and shows account for 81% of income generated from events (over a five-year average), primarily because of the Swap Meet.

Total event income increased by over 45% in fiscal year 2019 from fiscal year 2018, due in large part to the new concert activity being held in Aloha Stadium.
Over the last five years sports events have represented approximately 45% to 55% of in-stadium event activity.

With the exception of fiscal year 2019, sports events have typically accounted for 76% to 88% of in-stadium event income compared to non-sports events.

However, with the introduction of new concerts in 2019, non-sports events generated more event income for Aloha Stadium than sports events for the first time.

### Stadium Authority Financials

<table>
<thead>
<tr>
<th>Revenues:</th>
<th>FY2015</th>
<th>FY2016</th>
<th>FY2017</th>
<th>FY2018</th>
<th>FY2019</th>
<th>5 Year Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swap Meet</td>
<td>$4,445,067</td>
<td>$4,175,578</td>
<td>$4,440,883</td>
<td>$4,620,389</td>
<td>$4,269,859</td>
<td>$4,390,000 95%</td>
</tr>
<tr>
<td>Parking</td>
<td>$702,068</td>
<td>$874,689</td>
<td>$1,012,808</td>
<td>$959,685</td>
<td>$1,004,311</td>
<td>$1,091,000 14%</td>
</tr>
<tr>
<td>Food and Beverage</td>
<td>$977,746</td>
<td>$898,199</td>
<td>$1,016,810</td>
<td>$1,131,155</td>
<td>$2,232,665</td>
<td>$1,270,000 16%</td>
</tr>
<tr>
<td>Rent</td>
<td>$201,220</td>
<td>$290,689</td>
<td>$346,905</td>
<td>$225,407</td>
<td>$1,769,763</td>
<td>$579,000 7%</td>
</tr>
<tr>
<td>Advertising</td>
<td>$360,067</td>
<td>$365,032</td>
<td>$391,202</td>
<td>$387,145</td>
<td>$451,864</td>
<td>$379,000 5%</td>
</tr>
<tr>
<td>Interest</td>
<td>$20,064</td>
<td>$25,051</td>
<td>$24,582</td>
<td>$23,356</td>
<td>$24,000</td>
<td>$24,000 0%</td>
</tr>
<tr>
<td>Stadium Tours</td>
<td>$1,516</td>
<td>$2,779</td>
<td>$1,149</td>
<td>$1,111</td>
<td>$488</td>
<td>$1,000 0%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$196,720</td>
<td>$274,896</td>
<td>$341,118</td>
<td>$182,094</td>
<td>$255,810</td>
<td>$250,000 3%</td>
</tr>
<tr>
<td>Revenue (net)</td>
<td>$6,904,982</td>
<td>$6,899,374</td>
<td>$7,575,517</td>
<td>$7,829,962</td>
<td>$10,884,780</td>
<td>$7,884,000 100%</td>
</tr>
<tr>
<td>Expenses:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Services</td>
<td>$4,034,624</td>
<td>$4,115,021</td>
<td>$4,055,632</td>
<td>$4,383,983</td>
<td>$4,817,210</td>
<td>$4,289,000 61%</td>
</tr>
<tr>
<td>Supplies</td>
<td>$271,012</td>
<td>$216,677</td>
<td>$227,284</td>
<td>$243,192</td>
<td>$259,685</td>
<td>$254,000 4%</td>
</tr>
<tr>
<td>Utilities</td>
<td>$994,183</td>
<td>$962,090</td>
<td>$941,685</td>
<td>$904,109</td>
<td>$1,071,024</td>
<td>$975,000 14%</td>
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<tr>
<td>Repair and Maintenance</td>
<td>$213,520</td>
<td>$216,446</td>
<td>$285,145</td>
<td>$270,465</td>
<td>$274,014</td>
<td>$226,000 3%</td>
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<tr>
<td>Services on a Fee Basis</td>
<td>$489,026</td>
<td>$508,331</td>
<td>$473,471</td>
<td>$559,785</td>
<td>$574,439</td>
<td>$521,000 7%</td>
</tr>
<tr>
<td>Central Services Assessment</td>
<td>$408,348</td>
<td>$441,249</td>
<td>$499,207</td>
<td>$494,022</td>
<td>$508,355</td>
<td>$472,000 7%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$407,234</td>
<td>$318,502</td>
<td>$364,425</td>
<td>$276,417</td>
<td>$323,078</td>
<td>$268,000 4%</td>
</tr>
<tr>
<td>Indirect Expenses:</td>
<td>$8,877,847</td>
<td>$6,678,318</td>
<td>$6,688,279</td>
<td>$7,097,974</td>
<td>$7,857,809</td>
<td>$7,042,000 100%</td>
</tr>
<tr>
<td>Operating Income:</td>
<td>$27,355</td>
<td>$27,358</td>
<td>$877,238</td>
<td>$531,988</td>
<td>$3,026,051</td>
<td>$943,000</td>
</tr>
<tr>
<td>Operating Margin:</td>
<td>0.4%</td>
<td>3.2%</td>
<td>11.6%</td>
<td>7.0%</td>
<td>27.5%</td>
<td>11.8%</td>
</tr>
</tbody>
</table>

Source: Aloha Stadium Authority
Note: Unaudited financial statements

Stadium Authority operating income (and operating margin) was at its highest in fiscal year 2019. This is due in large part to seven (7) concerts being held at the stadium that year, compared to minimal concert activity in previous years, as described in more detail on the following page.
CONCERT ACTIVITY IN ALOHA STADIUM

PREVIOUS LACK OF CONCERT ACTIVITY

Before fiscal year 2018, Aloha Stadium did not host major concert activity. Based on feedback from Stadium Authority staff and interviews with regional/national concert promoters, Aloha Stadium did not typically host concerts in the past because:

- Aloha Stadium lacked the proper staging, rigging, and power supply desired by concert promoters.
- The current stadium at 50,000 seats is too large for many artists who prefer to fill smaller venues.
- Promoters and artists are concerned about the additional costs of adding a tour stop that is further away than typical continental United States tour locations.

RECENT CONCERT ACTIVITY

Since fiscal year 2018, Aloha Stadium has hosted eight concerts, with seven being held in fiscal year 2019. Six concerts have been booked/promoted by Live Nation with an average attendance of 30,743.

Aloha Stadium staff have made a concerted effort in recent years to attract more concert activity, however promoters indicated that the number of stadium concert shows will continue to fluctuate annually depending on how many large acts, and which acts, are touring each year. For example, in FY 2019, Bruno Mars specifically requested that Live Nation add his hometown (Honolulu) to his U.S. tour.

Lastly, concert promoters indicated that previous large concerts held at Aloha Stadium show that the market has the potential to support stadium concert activity and that a new stadium with proper staging, rigging, power, and other modern amenities should not have problems attracting large acts in Hawaii.

OTHER KEY REGIONAL CONCERT FACILITIES

Vicus Advisors has identified the following two (2) venues as the other major event facilities on the island of Oahu that can accommodate third-party ticketed events with a seating capacity of more than 2,000 people.

1. Neal S. Blaisdell Center/Concert Hall (8.5 miles from Aloha Stadium)
2. Tom Moffatt Waikiki Shell (11.9 miles)

Source: Google Maps
Note: Miles represent driving distance from Aloha Stadium
NEAL S. BLAISDELL CENTER/CONCERT HALL

- Opened: 1964; Renovated: 1994
- Original Construction Cost: $14M ($170.5M in 2019 dollars*)
- Owner/Operator: City and County of Honolulu
- Capacities: 8,800 (arena); 2,158 (concert hall)
- Annual Operations (according to Pollstar):
  - Arena:
    - 17 concerts/shows in 2018
    - 5,227 average tickets sold per event over the last 3 years
  - Concert Hall:
    - 18 concerts/shows in 2018
    - 1,974 average tickets sold per event over the last 3 years
- Premium Seating Amenities:
  - Arena:
    - 567 loge seats and pricing varies per event

TOM MOFFATT WAIKIKI SHELL

- Originally Opened: 1956
- Renovations: Expected to be completed in spring 2020
- Owner/Operator: City and County of Honolulu
- Capacity: 1,958 fixed seats, expandable to 8,000 via lawn seating
- Annual Operations (according to Pollstar):
  - 7 concerts/shows in 2018
  - 7,254 average tickets sold per event over the last 3 years
- Current Premium Seating Amenities:
  - No premium seating options
- Additional Notes:
  - Only four concerts/shows will be held in 2019 as focus is shifting to a major renovation of the facility. Proposed upgrades include leveling the wood stage floor and expanding rigging capacity from 500 pounds to 6,000 pounds. These two principal upgrades are intended to allow the venue to host a larger mix of shows and concerts.
OVERVIEW

This section is intended to provide an analysis of the demographic and socioeconomic trends of the Honolulu MSA and island of Oahu. Therefore this section includes:

- Demographic information
- Population distribution
- Median age distribution
- Median household income distribution
- Benchmarking of local market demographics/socioeconomics relative to markets hosting other Mountain West Conference football stadiums

The results of this analysis will be used to compare the Honolulu market to other similar markets around the country in terms of how the size of their stadiums is correlated to local demographic/socioeconomic data.
**HONOLULU MSA DEMOGRAPHICS**

<table>
<thead>
<tr>
<th></th>
<th>Honolulu MSA</th>
<th>Hawaii</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>1,066,142</td>
<td>1,449,919</td>
<td>332,417,793</td>
</tr>
<tr>
<td>Population Under 18</td>
<td>210,540</td>
<td>305,468</td>
<td>73,272,691</td>
</tr>
<tr>
<td>Percentage of Population Under 18</td>
<td>20.9%</td>
<td>21.1%</td>
<td>22.0%</td>
</tr>
<tr>
<td>Population Growth:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Pop. Growth (2000 to 2019)</td>
<td>0.7%</td>
<td>0.9%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Annual Pop. Growth (5-year Projection)</td>
<td>0.4%</td>
<td>0.5%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Projected Population (2024)</td>
<td>1,025,448</td>
<td>1,488,395</td>
<td>345,487,802</td>
</tr>
<tr>
<td>Median Age</td>
<td>38.6</td>
<td>39.4</td>
<td>38.5</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>$81,636</td>
<td>$77,491</td>
<td>$60,548</td>
</tr>
<tr>
<td>Adjusted Median Household Income (1)</td>
<td>$41,609</td>
<td>$46,319</td>
<td></td>
</tr>
<tr>
<td>Total Households</td>
<td>321,037</td>
<td>476,068</td>
<td>125,168,557</td>
</tr>
<tr>
<td>Households With Children Under 18</td>
<td>224,602</td>
<td>327,682</td>
<td>82,295,074</td>
</tr>
<tr>
<td>Percentage of Households With Children</td>
<td>70.0%</td>
<td>68.8%</td>
<td>65.7%</td>
</tr>
<tr>
<td>Total Businesses</td>
<td>32,201</td>
<td>49,927</td>
<td>12,112,147</td>
</tr>
</tbody>
</table>

Sources: Esri, United States Census Bureau, ACCRA Cost of Living Index, city-data.com
Note: (1) Adjusted for cost of living according to city-data.com and ACCRA Cost of Living Index

The Honolulu MSA is the 56th largest MSA in the country, surpassing the MSA’s of Omaha NE, Albuquerque NM, Knoxville TN, and Baton Rouge LA, among others.

The Honolulu MSA compares favorably to national averages when it comes to household income levels, the median age of the population, and the presence of working families with children. However, due to the high cost of living on the island, household incomes actually fall below the national average when adjusted for living costs.
The population of the Honolulu MSA is highly clustered around Honolulu and Waipahu, with Aloha Stadium falling directly in between the two cities.

The median age distribution around Honolulu indicates a higher likelihood of disposable income as well as the presence of families, both strong indicators for the spending of leisure dollars.
INCOME DISTRIBUTION

Median Household Income Distribution by Zip Code
- $113,288 to $132,685
- $88,744 to $113,287
- $65,905 to $88,742
- $20,074 to $65,904
- $0 to $20,073

Source: Esi

Median Household income levels are higher in the southern part of the island, which should have a direct positive effect on entertainment spending at a potential new Aloha Stadium.

COMPARATIVE MARKETS

COMPARATIVE MARKET SELECTION CRITERIA

For the purposes of comparative markets, we examined market areas with a stadium that has a primary college football tenant that tends to drive major revenue streams such as premium seating, corporate sponsorships, etc. Therefore we are comparing the Honolulu market to similar markets with stadiums that host a Mountain West Conference football program such as the University of Hawaii:

- Albuquerque, NM Metropolitan Statistical Area (University of New Mexico)
- Boise, ID Metropolitan Statistical Area (Boise State University)
- Cheyenne, WY Metropolitan Statistical Area (University of Wyoming)
- Colorado Springs, CO Metropolitan Statistical Area (Air Force Academy)
- Fort Collins, CO Metropolitan Statistical Area (Colorado State University)
- Fresno, CA Metropolitan Statistical Area (Fresno State University)
- Las Vegas, NV Metropolitan Statistical Area (University of Nevada-Las Vegas)
- Logan, UT Metropolitan Statistical Area (Utah State University)
- Reno, NV Metropolitan Statistical Area (University of Nevada)
- San Jose, CA Metropolitan Statistical Area (San Jose State University)
- San Diego, CA Metropolitan Statistical Area (San Diego State University)
## POPULATION

<table>
<thead>
<tr>
<th>MSA</th>
<th>MSA Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Diego</td>
<td>3,334,024</td>
</tr>
<tr>
<td>Las Vegas</td>
<td>2,257,890</td>
</tr>
<tr>
<td>San Jose</td>
<td>2,010,116</td>
</tr>
<tr>
<td>Honolulu</td>
<td>1,006,142</td>
</tr>
<tr>
<td>Fresno</td>
<td>1,004,546</td>
</tr>
<tr>
<td>Albuquerque</td>
<td>938,434</td>
</tr>
<tr>
<td>Colorado Springs</td>
<td>750,549</td>
</tr>
<tr>
<td>Boise</td>
<td>747,439</td>
</tr>
<tr>
<td>Reno</td>
<td>485,737</td>
</tr>
<tr>
<td>Fort Collins</td>
<td>359,259</td>
</tr>
<tr>
<td>Logan</td>
<td>145,636</td>
</tr>
<tr>
<td>Cheyenne</td>
<td>101,401</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>1,095,098</strong></td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td><strong>844,492</strong></td>
</tr>
</tbody>
</table>

Source: Esri  
Note: Sorted by MSA Population in descending order

The Honolulu MSA's population of over one million people represents the fourth most populated out of the 12 markets selected for comparative analysis.

## POPULATION GROWTH

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Boise</td>
<td>2.5%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Fort Collins</td>
<td>1.9%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Las Vegas</td>
<td>2.6%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Colorado Springs</td>
<td>1.8%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Reno</td>
<td>1.8%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Logan</td>
<td>1.9%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Albuquerque</td>
<td>1.3%</td>
<td>1.1%</td>
</tr>
<tr>
<td>San Jose</td>
<td>0.8%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Cheyenne</td>
<td>1.1%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Fresno</td>
<td>1.2%</td>
<td>0.8%</td>
</tr>
<tr>
<td>San Diego</td>
<td>0.9%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Honolulu</td>
<td>0.7%</td>
<td>0.4%</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><em>1.2%</em></td>
<td></td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td><em>1.3%</em></td>
<td></td>
</tr>
</tbody>
</table>

Source: Esri  
Note: Sorted by Proj. Annual Pop. Growth (2019-2024) in descending order

The Honolulu MSA ranks last in terms of projected annual growth amongst comparative markets.
**MEDIAN AGE**

<table>
<thead>
<tr>
<th>MSA</th>
<th>Median Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logan</td>
<td>27.6</td>
</tr>
<tr>
<td>Fresno</td>
<td>32.1</td>
</tr>
<tr>
<td>Boise</td>
<td>35.6</td>
</tr>
<tr>
<td>San Diego</td>
<td>35.9</td>
</tr>
<tr>
<td>Colorado Springs</td>
<td>36.3</td>
</tr>
<tr>
<td>Las Vegas</td>
<td>37.0</td>
</tr>
<tr>
<td>Fort Collins</td>
<td>37.1</td>
</tr>
<tr>
<td>San Jose</td>
<td>37.6</td>
</tr>
<tr>
<td>Albuquerque</td>
<td>37.8</td>
</tr>
<tr>
<td>Reno</td>
<td>38.3</td>
</tr>
<tr>
<td>Cheyenne</td>
<td>38.4</td>
</tr>
<tr>
<td>Honolulu</td>
<td>38.6</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>36.0</strong></td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td><strong>37.1</strong></td>
</tr>
</tbody>
</table>

Source: Esri  
Note: Sorted by Median Age in ascending order

The Honolulu MSA has the highest median age amongst comparative markets, indicating an older market that could have a larger presence of retirement aged individuals who often have smaller disposable income budgets and partake in a more limited range of entertainment options.

---

**ADJUSTED HOUSEHOLD INCOME**

<table>
<thead>
<tr>
<th>MSA</th>
<th>Median Household Income</th>
<th>Adj. Median Household Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Jose</td>
<td>$118,922</td>
<td>$78,652</td>
</tr>
<tr>
<td>Cheyenne</td>
<td>$61,151</td>
<td>$73,943</td>
</tr>
<tr>
<td>Fort Collins</td>
<td>$71,240</td>
<td>$71,454</td>
</tr>
<tr>
<td>Colorado Springs</td>
<td>$65,785</td>
<td>$67,403</td>
</tr>
<tr>
<td>Reno</td>
<td>$63,643</td>
<td>$65,208</td>
</tr>
<tr>
<td>Boise</td>
<td>$56,951</td>
<td>$51,836</td>
</tr>
<tr>
<td>Las Vegas</td>
<td>$58,836</td>
<td>$51,033</td>
</tr>
<tr>
<td>Logan</td>
<td>$53,188</td>
<td>$90,304</td>
</tr>
<tr>
<td>San Diego</td>
<td>$78,492</td>
<td>$56,878</td>
</tr>
<tr>
<td>Fresno</td>
<td>$53,108</td>
<td>$56,199</td>
</tr>
<tr>
<td>Albuquerque</td>
<td>$51,786</td>
<td>$56,045</td>
</tr>
<tr>
<td>Honolulu</td>
<td>$81,636</td>
<td>$41,669</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>$62,547</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td><strong>$81,435</strong></td>
<td></td>
</tr>
</tbody>
</table>

Sources: Esri, city-data.com  
*Adjusted for cost of living according to city-data.com and ACCRA Cost of Living Index  
Note: Sorted by Adj. Median Household Income in descending order

When adjusted for cost of living, the Honolulu MSA’s median household income ranks last among comparable stadium markets. Relative to other large markets, this data indicates that Honolulu MSA households may have less discretionary income for entertainment spending.
## HIGH-INCOME HOUSEHOLDS

<table>
<thead>
<tr>
<th>MSA</th>
<th>Total Households</th>
<th>Households w/ Income Over $150k</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Diego</td>
<td>1,165,877</td>
<td>272,774</td>
</tr>
<tr>
<td>San Jose</td>
<td>672,055</td>
<td>244,049</td>
</tr>
<tr>
<td>Las Vegas</td>
<td>816,505</td>
<td>86,977</td>
</tr>
<tr>
<td>Honolulu</td>
<td>321,037</td>
<td>67,574</td>
</tr>
<tr>
<td>Colorado Springs</td>
<td>284,856</td>
<td>38,895</td>
</tr>
<tr>
<td>Fresno</td>
<td>310,310</td>
<td>34,153</td>
</tr>
<tr>
<td>Albuquerque</td>
<td>363,740</td>
<td>33,033</td>
</tr>
<tr>
<td>Boise</td>
<td>271,357</td>
<td>26,804</td>
</tr>
<tr>
<td>Reno</td>
<td>187,168</td>
<td>22,731</td>
</tr>
<tr>
<td>Fort Collins</td>
<td>142,736</td>
<td>21,784</td>
</tr>
<tr>
<td>Cheyenne</td>
<td>40,952</td>
<td>3,040</td>
</tr>
<tr>
<td>Logan</td>
<td>45,105</td>
<td>2,852</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>385,142</strong></td>
<td><strong>71,222</strong></td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td><strong>297,583</strong></td>
<td><strong>33,593</strong></td>
</tr>
</tbody>
</table>

Source: Esri  
*Note: Sorted by Households w/ Income Over $150k in descending order*

The Honolulu MSA ranks fourth among comparable stadium markets in terms of households with income over $150,000. Households with higher income levels could have more disposable income for sports and entertainment events.

---

## CORPORATE BASE

<table>
<thead>
<tr>
<th>MSA</th>
<th>Total Businesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Diego</td>
<td>139,329</td>
</tr>
<tr>
<td>San Jose</td>
<td>79,921</td>
</tr>
<tr>
<td>Las Vegas</td>
<td>72,501</td>
</tr>
<tr>
<td>Fresno</td>
<td>32,980</td>
</tr>
<tr>
<td>Honolulu</td>
<td>32,201</td>
</tr>
<tr>
<td>Albuquerque</td>
<td>31,383</td>
</tr>
<tr>
<td>Boise</td>
<td>25,277</td>
</tr>
<tr>
<td>Colorado Springs</td>
<td>24,774</td>
</tr>
<tr>
<td>Reno</td>
<td>17,100</td>
</tr>
<tr>
<td>Fort Collins</td>
<td>14,633</td>
</tr>
<tr>
<td>Cheyenne</td>
<td>4,570</td>
</tr>
<tr>
<td>Logan</td>
<td>3,927</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>39,883</strong></td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td><strong>28,330</strong></td>
</tr>
</tbody>
</table>

Source: Esri  
*Note: Sorted by Total Businesses in descending order*

Among comparable markets, the Honolulu MSA has the fifth largest corporate base, indicating that the market has solid potential for businesses to purchase event tickets, premium seating amenities, and sponsorship opportunities.
4. COMPARABLE STADIUM CASE STUDIES

COMPARABLE STADIUM OVERVIEW

Victus also analyzed the stadiums that currently are or will be the home venue for Mountain West Conference (MWC) football programs follows:

- Albertsons Stadium (Boise State University)
- Allegiant Stadium (University of Nevada-Las Vegas)*
- Bulldog Stadium (Fresno State University)
- Canvas Stadium (Colorado State University)
- CEFCU Stadium (San Jose State University)
- Dreamstyle Stadium (University of New Mexico)
- Falcon Stadium (Air Force Academy)
- Mackay Stadium (University of Nevada)
- Maverik Stadium (Utah State University)
- SDCCU Stadium (San Diego State University)**
- New San Diego Stadium (San Diego State University)**
- War Memorial Stadium (University of Wyoming)

* UNLV Football will be a secondary tenant at Allegiant Stadium after the NFL Las Vegas Raiders, therefore this stadium will be excluded from future analysis in later sections of this report.

** SDSU football is in the process of planning a new stadium to be located on the same site as SDCCU Stadium.
ALBERTSONS STADIUM

- Location: Boise, Idaho (On-campus)
- Opened: 1970; Renovated: 1997
- Renovation Cost: $10M ($21.9M in 2019 dollars*)
- Owner/Operator: Boise State University
- Naming Rights: $12.5M over 15 years
- Capacity: 36,387
- Tenants: Boise State Football, Famous Idaho Potato Bowl
- 2018 Events & Attendance:
  - 6 Boise State regular season games (34,625 average attendees)
  - Mountain West Conference Championship Game (23,662 attendees)
  - Famous Idaho Potato Bowl (18,711 attendees)
- Premium Seating Amenities:
  - 39 Suites ($43,318 to $53,500 per year)
  - 48 Loge Boxes ($13,200 to $15,000 per year)
  - 832 Club Seats ($2,288 to $3,000 per year)

* Estimated according to the Turner Building Cost Index

ALLEGIANT STADIUM

- Location: Paradise, Nevada (Off-campus)
- Projected Opening: 2020
- Projected Construction Cost: $1.9B
- Owner: Las Vegas Stadium Authority
- Operator: AEG Facilities
- Naming Rights: $500M over 25 years (Estimated)
- Capacity: 65,000
- Projected Tenants: Las Vegas Raiders, UNLV Football, Las Vegas Bowl
- Projected Events:
  - 8 Las Vegas Raiders regular season games
  - 6 UNLV regular season games
  - Pac-12 Football Championship Game
  - Las Vegas Bowl
  - Super Bowl, neutral-site college football games, international soccer matches, concerts, etc.
- Premium Seating Amenities:
  - The majority of premium seating options at Allegiant Stadium were built for the NFL Las Vegas Raiders, however UNLV will have the ability to sell the following amenities on their gamedays:
    - 109 Suites ($22,000 to $40,000 per UNLV season)
    - 600 Club Seats ($2,000 to $2,500 per UNLV season)
BULLDOG STADIUM

- Location: Fresno, California (On-campus)
- Opened: 1980
- Construction Cost: $7M ($29.5M in 2019 dollars*)
- Owner/Operator: Fresno State University
- Capacity: 40,727
- Tenant: Fresno State Football
- 2018 Events & Attendance:
  - 6 Fresno State regular season games (31,503 average attendees)
- Premium Seating Amenities:
  - 22 Suites ($35,000 per year)

CANVAS STADIUM

- Location: Fort Collins, Colorado (On-campus)
- Opened: 2017
- Construction Cost: $220M ($243.5M in 2019 dollars*)
- Owner/Operator: Colorado State University
- Capacity: 41,200
- Naming Rights: $37.7M over 15 years
- Tenant: Colorado State Football
- 2018 Events & Attendance:
  - 6 Colorado State regular season games (29,504 average attendees)
- Premium Seating Amenities:
  - 22 Suites ($35,000 to $45,000 per year)
  - 43 Loge Boxes ($12,000 to $16,000 per year)
  - 1,038 Club Seats ($1,500 to $2,300 per year)
CEFCU STADIUM

- Location: San Jose, California (Off-campus)
- Opened: 1933; Renovated: 1985
- Owner/Operator: San Jose State University
- Capacity: 30,456
- Naming Rights: $8.7M over 15 years
- Tenant: San Jose State Football
- 2018 Events & Attendance:
  - 5 San Jose State regular season games (14,255 average attendees)
- Premium Seating Amenities:
  - 12 Suites ($15,000 per year)
  - 3,540 Club Seats ($280 to $750 per year)

DREAMSTYLE STADIUM

- Location: Albuquerque, New Mexico (On-campus)
- Opened: 1960
- Construction Cost: $4.1M ($53.1M in 2019 dollars*)
- Owner/Operator: University of New Mexico
- Naming Rights: $10M over 10 years
- Capacity: 39,224
- Tenants: New Mexico Football, New Mexico Bowl
- 2018 Events & Attendance:
  - 6 New Mexico regular season games (16,587 average attendees)
  - New Mexico Bowl (25,387 attendees)
- Premium Seating Amenities:
  - 9 Suites ($21,000 per year)
  - 1,597 Club Seats ($839 per year)
FALCON STADIUM

- Location: Colorado Springs, Colorado (On-campus)
- Opened: 1962
- Construction Cost: $3.5M ($44.3M in 2019 dollars*)
- Owner/Operator: Air Force Academy
- Capacity: 46,692
- Tenant: Air Force Academy Football
- 2018 Events & Attendance:
  - 6 Air Force regular season games (27,701 average attendees)
- Premium Seating Amenities:
  - 6 Suites ($27,000 per year)
  - 621 Club Seats ($1,825 per year)

MACKAY STADIUM

- Location: Reno, Nevada (On-campus)
- Opened: 1966; Renovated: 2016
- Renovation Cost: $14M ($16.3M in 2019 dollars*)
- Owner/Operator: University of Nevada
- Capacity: 30,000
- Tenant: Nevada Football
- 2018 Events & Attendance:
  - 6 Nevada regular season games (17,181 average attendees)
- Premium Seating Amenities:
  - 57 Suites ($15,400 to $50,000 per year)
  - 24 Loge Boxes ($8,100 to $9,100 per year)
  - 234 Club Seats ($1,225 per year)
MAVERIK STADIUM

- Location: Logan, Utah (On-campus)
- Renovation Cost: $36M ($41.8M in 2019 dollars*)
- Owner/Operator: Utah State University
- Naming Rights: $6.3M over 18 years
- Capacity: 25,100
- Tenant: Utah State Football
- 2018 Events & Attendance:
  - 6 Utah State regular season games (18,717 average attendees)
- Premium Seating Amenities:
  - 20 Suites ($43,280 per year)
  - 20 Loge Boxes ($11,300 per year)
  - 700 Club Seats ($1,325 per year)

SDCCU STADIUM

- Location: San Diego, California (Off-campus)
- Opened: 1967
- Construction Cost: $27.75M ($318.8M in 2019 dollars*)
- Owner/Operator: City of San Diego
- Naming Rights: $2M over 4 years
- Capacity: 54,000
- Tenants: San Diego State Football, Holiday Bowl
- 2018 Events & Attendance:
  - 7 San Diego State regular season games (31,439 average attendees)
  - Holiday Bowl (47,007 attendees)
  - International soccer matches
  - Additional events such as swap meets, RV and car shows, and one concert
- Premium Seating Amenities:
  - 20 Suites ($10,800 per year)
  - 7,800 Club Seats (pricing n/a)
NEW SAN DIEGO STATE STADIUM & ANCILLARY DEVELOPMENT

- Location: San Diego, California (Off-campus)
- Projected Opening: 2022
- Projected Construction Cost: $250M
- Owner/Operator: San Diego State University
- Naming Rights: TBD
- Capacity: 35,000
- Projected Tenants: SDSU Football, potential Major League Soccer franchise
- Projected Events:
  - 6 San Diego State regular season games
  - International soccer matches, concerts, etc.
- Premium Seating Amenities:
  - TBD
- Additional Notes:
  - In November 2018, San Diego citizens voted in favor of a ballot measure to approve construction of a new San Diego State University stadium on the current site of SDCCU Stadium.
  - The overall development will include: 89 acres of parks and open space, 4,500 faculty and market-rate housing units, 1.6 million square feet of office space, 95,000 square feet of neighborhood-serving retail stores and 400 hotel rooms spread across two hotels.
  - SDSU’s funding of the new stadium construction costs will be backed by revenue generated by other real estate development on the site.

WAR MEMORIAL STADIUM

- Location: Laramie, Wyoming (On-campus)
- Opened: 1950; Renovated: 2010
- Renovation Cost: Over $50M (Over $71M in 2019 dollars*)
- Owner/Operator: University of Wyoming
- Capacity: 29,181
- Tenant: Wyoming Football
- 2018 Events & Attendance:
  - 6 Wyoming regular season games (18,885 average attendees)
- Premium Seating Amenities:
  - 10 Suites ($44,000 per year)
  - 311 Club Seats ($2,750 per year)

* Estimated according to the Turner Building Cost Index
## COMPARABLE STADIUM SUMMARY

<table>
<thead>
<tr>
<th>Stadium</th>
<th>University</th>
<th>Location</th>
<th>Open/Reno. Year</th>
<th>Seating Capacity</th>
<th>Construction or Renovation Cost (2019$)</th>
<th>Primary Sports Tenants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allegiant Stadium</td>
<td>UNLV</td>
<td>Off-Campus</td>
<td>2020</td>
<td>65,000</td>
<td>$1,900,000,000</td>
<td>Las Vegas Raiders, UNLV Football, Las Vegas Bowl</td>
</tr>
<tr>
<td>New San Diego Stadium</td>
<td>San Diego State</td>
<td>Off-Campus</td>
<td>2022</td>
<td>35,000</td>
<td>$250,000,000</td>
<td>San Diego State Football</td>
</tr>
<tr>
<td>Canvas Stadium</td>
<td>Colorado State</td>
<td>On-Campus</td>
<td>2017</td>
<td>41,200</td>
<td>$243,526,012</td>
<td>Colorado State Football</td>
</tr>
<tr>
<td>War Memorial</td>
<td>Wyoming</td>
<td>On-Campus</td>
<td>2010</td>
<td>25,181</td>
<td>$71,902,378</td>
<td>Wyoming Football</td>
</tr>
<tr>
<td>Dreamstyle Stadium</td>
<td>New Mexico</td>
<td>On-Campus</td>
<td>1980</td>
<td>39,224</td>
<td>$53,096,956</td>
<td>New Mexico Football, New Mexico Bowl</td>
</tr>
<tr>
<td>Falcon Stadium</td>
<td>Airforce</td>
<td>On-Campus</td>
<td>1962</td>
<td>46,692</td>
<td>$44,323,388</td>
<td>Air Force Football</td>
</tr>
<tr>
<td>Maverik Stadium</td>
<td>Utah State</td>
<td>On-Campus</td>
<td>2016</td>
<td>25,100</td>
<td>$41,824,065</td>
<td>Utah State Football</td>
</tr>
<tr>
<td>Bulldog Stadium</td>
<td>Fresno State</td>
<td>On-Campus</td>
<td>1980</td>
<td>40,727</td>
<td>$29,461,538</td>
<td>Fresno State Football</td>
</tr>
<tr>
<td>Albertsons Stadium</td>
<td>Boise State</td>
<td>On-Campus</td>
<td>1997</td>
<td>36,387</td>
<td>$21,885,714</td>
<td>Boise State Football, Famous Idaho Potato Bowl</td>
</tr>
<tr>
<td>Mackay Stadium</td>
<td>Nevada</td>
<td>On-Campus</td>
<td>2016</td>
<td>30,000</td>
<td>$16,264,914</td>
<td>Nevada Football</td>
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<tr>
<td>CEFCU Stadium</td>
<td>San Jose</td>
<td>Off-Campus</td>
<td>1933</td>
<td>30,456</td>
<td>$NA</td>
<td>San Jose Football</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td></td>
<td></td>
<td>1984</td>
<td>38,088</td>
<td><strong>$287,229,098</strong></td>
<td></td>
</tr>
<tr>
<td><strong>MEDIAN</strong></td>
<td></td>
<td></td>
<td>2010</td>
<td>36,387</td>
<td><strong>$48,715,172</strong></td>
<td></td>
</tr>
</tbody>
</table>

Sources: Esri, Stadium operators, Victus research, Turner Building Cost Index

Notes: (1) Sorted by Construction or Renovation Cost (2019$) in descending order (2) Allegiant Stadium will be the new home of UNLV football in 2020

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### STADIUM SUMMARY NOTES

- **Location** - All but three MWC stadiums (Allegiant Stadium, New San Diego Stadium, CEFCU Stadium) are on university campuses.

- **Construction Cost** - Construction/renovation costs for most MWC stadiums (excluding Allegiant Stadium) ranged between $16 million and $250 million in 2019 dollars.

- **Ancillary Development** - The new San Diego Stadium is the only stadium that is currently planned as the anchor of an off-campus ancillary development district.
Victras Advisors conducted telephone interviews with a variety of operators, promoters, and influencers of sports and entertainment events. Interviews were conducted to gather opinions and insight directly from the potential users of a new Aloha Stadium, such as AEG, Feld Entertainment, Grand Pacific Events, Hawaii Tourism Authority, LiveNation, and World Fighting Championships. This section presents a summary of the information provided to Victras Advisors by event promoters, and it is organized according to the following event types (in alphabetical order):

- Concerts
- Mixed Martial Arts
- Motor Sports
- Rugby
- Soccer

CONCERTS

CURRENT STADIUM

Concert promoters and organizers said that the current Aloha Stadium can be a challenging place to do shows. As a 45-year-old stadium, it lacks basic infrastructure, adequate restrooms, offices, proper catering facilities, and updated dressing rooms. Groups described the loading in and out of equipment to be challenging. None of the current amenities meet what touring artists typically look for in a venue. Updated dressing rooms were one of the specific amenities mentioned.

The current stadium was also described as an inadequate venue from the patrons’ standpoint. Issues mentioned included lack of parking, inadequate restrooms, and problems with ingress and egress at the stadium. The limited number of merchandise stands, restrooms, and concessions stands have also caused long and inefficient lines. Lines into the stadium were also described as too long and a negative factor on the fan experience.

According to concert promoters, one of the biggest barriers to doing shows at Aloha Stadium is also the location in Hawaii. It is expensive to freight equipment (stage, lighting, etc.) to the State via air or boat. Some events that were previously held at Aloha Stadium had equipment already in Hawaii, which reduced expenses.
IDEAL AMENITIES

Concert promoters have seen stadiums and other venues in the past overlook concerts during design phases. The ability of stadiums to host concerts should be taken into consideration before a venue is built, and not added on as an afterthought.

Interviewees said that a new stadium should have endzone seats that are retractable at one end to fit a stage and a canopy system/structure over the stage. The stadium structure should include a steel rigging system that can support the full weight of a grid for a concert. It is expensive to get a stage and equipment to Hawaii from the mainland, and having a built-in system like this would cut down on promoter costs by requiring less equipment to be shipped to the new stadium. An overhead setup like this would also open additional seats/sightlines on the sides of the stage.

Concerts will utilize the field as floor space seating for shows. This field seating could accommodate around 10,000 attendees. A new stadium must be able to have enough exits to easily accommodate this large amount of people leaving a show.

IDEAL AMENITIES (CONT.)

Ideally, interviewees said that the Stadium should hire specific operational staff that are focused on providing support for concert producers and other third-party events.

Groups said that a new stadium should have additional event spaces that are flexible and adaptable for different needs. These spaces included meeting rooms, hosting/hospitality spaces, and indoor catering space. Other important space improvements included updated exterior spaces, such as a plaza or other gathering space outside of the stadium for pre- and post-event staging areas.

Groups mentioned that the new stadium should have an increased number and diversity of premium seating options. Premium seating should not be limited to just suites, but should also include loge spaces and more group seating options for a variety of group sizes. According to those interviewed, this is the continuing trend in premium seating at stadiums and arenas.
CONCERTS (CONT.)

DEMAND FOR A NEW STADIUM

Interviewees said that there are only a small number of acts that sell more than 35,000 seats (Bruno Mars, Taylor Swift, etc.). Interviewees believe that the ideal range for seating at a stadium concert is between 25,000 and 30,000 seats, and that the proposed fixed seating capacity for a new Aloha Stadium of 30,000 to 35,000 makes sense for the market. Interviewees referenced the recent large concerts held at Aloha Stadium to show that the market has the potential to support stadium concert activity and that a new stadium with new amenities should not have problems attracting large acts in Hawaii.

Interviewees said that they believe more concerts can be held at a new stadium if the new amenities are in place as described on the previous pages. Groups mentioned that the number of stadium concert shows fluctuate annually depending on what large acts are touring that specific year. Interviewees stressed the importance of having the rigging structure in place at the stadium to cut down on costs and enhance the concert experience at the venue. Cost savings from this set-up were estimated by some to be nearly $500,000 per show.

MIXED MARTIAL ARTS (MMA)

Interviewees said that smaller promotions would not be able to fill a 30,000 to 35,000 seat stadium. Groups said that UFC would be the only event large enough to justify the use of the stadium for an event. Interviewees also commented that involving popular fighters from Hawaii (B.J. Penn, Max Holloway, etc.) would also drive interest in an MMA event. (Note: Victus Advisors has contacted UFC for an interview, but has not yet completed a formal interview as of the date of this draft report.)

MOTOR SPORTS

CURRENT OPERATIONS

Stadium motorsports events include monster truck events and off-road motorcycle racing (Supercross, Motocross, etc.). Some interviewees said that they currently do not come to Honolulu for stadium events purely because of the high shipping expense of putting on an event on the island. Involvement and financial support from convention/visitors bureaus (CVBs), and tourism authorities makes it more likely to be able to host events in Hawaii. Interviewees are interested in figuring out how to host motorsports events at a new facility in Hawaii. Such events would be attractive to organizers if grant money were available to them from tourism authorities and CVBs.
MOTOR SPORTS (CONT.)

IDEAL AMENITIES

Groups said that some new major stadium projects recently completed in the U.S. did not have field access for monster trucks or other large equipment. Motor sport events require a lot of dirt and equipment. Events need the ability to get large equipment (trucks, tractors, etc.) in and out of stadiums quickly and easily during set up and takedown.

High tech audio and visual capabilities and equipment were also mentioned by interviewees as important amenities at a new stadium. Large and high-quality A/V set ups are critical for these events. In addition, for televised events, production space is also required.

Interviewees said that they utilize several VIP areas and suites during events. These assets are important to provide to sponsors and other attendees. Typically, they like to have access to anywhere from 8 to 20 suites (and/or loge boxes) to provide sponsors, depending on the tour stop.

Motor sports events also tend to have a large footprint outside of the stadium. Pit parties, fan fests, and similar official activities hosted by the event take place in parking lots and other large spaces near to the venue. On-site spaces outside the stadium should be designed large enough to accommodate both parking and gathering space for these fan activities.

MOTOR SPORTS (CONT.)

IDEAL AMENITIES (CONT.)

A new stadium with 35,000 seats can work for motorcycle races, but it would be on the lower end of seating capacity for venues on their tours. Other stadium motor sports events take place in MLB stadiums, and these events typically sell around 36,000 to 37,000 tickets.

DEMAND FOR NEW STADIUM

If event organizers can receive financial support from CVBs and/or tourism authorities, they would be interested in bringing new events to Hawaii. These events would likely be a few annual events.
RUGBY

CURRENT STADIUM

Interviewees said that the current Aloha Stadium has tried to make the turf compliant (Reg 22) for international rugby matches in the past but ran into construction issues. The width and length of the current field needs to be extended for international rugby matches to be played at Aloha Stadium.

Rugby events that have been held at the Stadium have benefitted from the multiple locker room set up. The multiple locker rooms are necessary for a full day of rugby events (multiple teams) and performers.

IDEAL AMENITIES

Rugby organizations and event organizers have liked aspects of the current Aloha Stadium (multiple locker rooms, atmosphere, etc.) but cannot work around the turf not being Reg 22 compliant. A new Aloha Stadium needs to have compliant artificial turf or the ability to have natural grass at the stadium to host international or large rugby events.

Parking and transportation were issues mentioned during interviews. Public transportation and adequate parking need to be provided at a new stadium to help attendees avoid traffic at events that take place throughout the day (multiple matches, etc.).

RUGBY (CONT.)

IDEAL AMENITIES (CONT.)

According to interviewees, other international rugby sevens events in Las Vegas drew 30,000 to 35,000 people with many attendees coming from Hawaii and the Pacific Islands. Rugby event organizers expect people to travel to future events in Hawaii and plan vacations around the events. A 35,000-seat stadium would be sufficient for any rugby event hosted at a new Aloha Stadium.

Suites and premium seating would be needed for premier events or preseason professional rugby games held at a new stadium. Interviewees recommended that updated suites located along the sidelines would work for their needs, as suites and boxes located in the endzones do not provide good viewing for VIP attendees at events. Premium suites would also need to be air-conditioned for entertaining sponsors.

DEMAND FOR NEW STADIUM

Interviewees said that rugby groups have already expressed interest in holding events in Hawaii. A new stadium could host National Rugby League (NRL) preseason games, World Rugby Sevens, State of Origin (Australia), and other international rugby events and tournaments. Interviewees also said that the facility could also host youth tournaments (rugby, soccer, field hockey) with championship games played at the stadium.
SOCRER

Soccer events in the past have had issues with field conditions at Aloha Stadium. Interviewees said that a new stadium should be able to fit a full-sized soccer field with proper bench seating. The field surface should also be appropriate for soccer matches, preferably natural grass. Interviewees mentioned that artificial turf is always an issue when trying to attract soccer events.

Interviewees suggested that a multiple turf system could increase the flexibility and help the new stadium attract more sporting events. For example, State Farm Stadium (Arizona Cardinals) has a concrete floor for concerts and multi-use events, and a natural grass field that can be rolled into the stadium for football and other field sports. Additionally, Allegiant Stadium (Oakland Raiders), which is currently under construction in Las Vegas, plans to have an artificial turf base field with a roll-in natural grass turf option.

INTERVIEW KEY TAKEAWAYS

Feedback from interviews indicated that many events would be interested in utilizing a newly-built Aloha Stadium if the proper amenities were included in the new construction. Interviewees said that a new stadium with no more than 35,000 fixed seats would have adequate seating for their events. Below is a summary of the key takeaways from each event type:

CONCERTS

• Rigging grid system on-site
• Updated dressing rooms for acts
• Proper venue exits for field seats
• Additional operations staff dedicated to event services
• Diverse premium seating options: suites, loge boxes, group seating for all sizes

MOTOR SPORTS

• Adequate field access for equipment
• Large event space outside of the stadium for pre-event activities
• Premium seating: access to suites/boxes for corporate sponsors
• Financial support from CVB and/or tourism authority
RUGBY

- Adequate field size
- Reg 22-compliant turf
- Multiple locker rooms
- Premium seating: Suites/boxes located on sideline rather than end zone

SOCCER

- Adequate field size
- Appropriate playing surface (natural grass preferred)
ALOHA UTILIZATION ESTIMATES

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Event Days</th>
<th>Average Attendees per Event</th>
<th>Total Attendees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Events (2019 Fiscal Year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runs</td>
<td>1</td>
<td>15,736</td>
<td>15,736</td>
</tr>
<tr>
<td>Sports Events</td>
<td>52</td>
<td>6,127</td>
<td>318,604</td>
</tr>
<tr>
<td>Concerts</td>
<td>7</td>
<td>30,198</td>
<td>211,383</td>
</tr>
<tr>
<td>Swap Meet</td>
<td>153</td>
<td>6,725</td>
<td>1,028,925</td>
</tr>
<tr>
<td>Other Events &amp; Shows (Graduations, Parties, etc.)</td>
<td>82</td>
<td>1,301</td>
<td>106,710</td>
</tr>
<tr>
<td>Annual Total</td>
<td>295</td>
<td>5,700</td>
<td>1,681,358</td>
</tr>
</tbody>
</table>

| New Events                              |            |                            |                 |
| Concerts & Entertainment Acts           | 3          | 25,000                     | 75,000          |
| Sports Events (Soccer, Rugby, Motor Sports, etc.) | 7          | 15,000                     | 105,000         |
| Annual Total                            | 10         | 18,000                     | 180,000         |
| New Grand Total                         | 305        | 6,103                      | 1,861,358       |

Notes: (1) Represents a stabilized year of operations (2) Estimates are intended to represent a conservative, base-case scenario.

Based upon the historical analysis, demographic and market analysis, interviews with event organizers/promoters, and Victus Advisors’ industry expertise, it is conservatively estimated that a new Aloha Stadium could host approximately 305 events per year, with an estimated annual attendance of over 1.8 million people. With a new Aloha Stadium, we have estimated that the Honolulu market could capture at least 10 new major sports and entertainment events each year (concerts, soccer, rugby, motor sports, etc.), beyond the existing event activity that occurred at Aloha Stadium in FY 2019.

SPORTS UTILIZATION AT ALOHA STADIUM

FOOTBALL

Over the past five fiscal years, football events have been the primary sports users of Aloha Stadium, in particular University of Hawaii football and interscholastic/prep football. It is expected that these football events will continue to be the primary sports tenants of a new Aloha Stadium. Over the last five seasons, University of Hawaii Football has averaged just under 25,000 spectators. The highest attended game was 36,411 during the 2014 season.

OTHER SPORTS (SOCCER, RUGBY, ETC.) AND FIELD SPECIFICATIONS

A new Aloha Stadium should have the ability to host soccer and rugby events on compliant natural grass turf in order to host large international events. Soccer and rugby events in the past have had issues with field conditions at Aloha Stadium.

Lastly, according to motor sports promoters, a stadium with 35,000 seats would be on the small size for their events, but can work for motorcycle races.
CONCERTS

Concert promoters and organizers said that the current Aloha Stadium is a challenging place to do shows. It is not user friendly and lacks basic infrastructure, adequate restrooms, offices, proper catering facilities, and updated dressing rooms. Groups described the loading in and out of equipment to be challenging. In spite of the challenges, promoters believe the market has the potential to support stadium concert activity and that a new stadium with new amenities should not have problems attracting large acts in Hawaii.

Promoters believe that the ideal range for seating at a stadium concert is between 25,000 and 30,000 seats and that the proposed seating capacity of 35,000 for a new Aloha Stadium makes sense for the Honolulu market.

AVERAGE CONCERT ATTENDANCE IN OAHU

As shown above Aloha Stadium has hosted the highest attended concerts in the market, and should continue to do so in a new stadium with approximately 35,000 fixed seats.
Blaisdell Arena (8,800 seats) can only accommodate approximately 60% of the annual top 200 concerts in the United States. Conversely, a new Aloha Stadium with a seating capacity of 35,000 seats could capture over 97% of the concert market in the United States.

**CONCERTS AT A NEW ALOHA STADIUM**

**ESTIMATED CONCERT USAGE**

It is conservatively estimated that a new Aloha Stadium could attract approximately 10 annual concert and entertainment events each year.

**ATTRACTING CONCERTS**

Ultimately, the ability of Aloha Stadium to attract these new concert events will come down to more than just having a properly sized and configured venue. In addition, to compete for major concert activity, it is likely that the Stadium Authority, the State, and/or the Hawaii Tourism Authority would have to financially incentivize some concert promoters to add Aloha Stadium and the Honolulu/Oahu market to their tours.

Additionally, as shown at right, it is estimated that Live Nation and AEG control approximately 82% of the concert performance market in the United States. Relationships with Live Nation, AEG, and other national touring act promoters will be the key to long-term event usage at a new Aloha Stadium.
Our facility recommendations for a new Aloha Stadium are based primarily upon the following primary and secondary research conducted by Victus Advisors over the course of this study:

- Analysis of Honolulu’s unique market characteristics
- Review of comparative markets and facilities
- Interviews conducted with event organizers and operators

Based on customized research and our extensive industry experience, we have identified that significant community demand exists for a new Aloha Stadium.
RECOMMENDED STADIUM PROGRAM

RECOMMENDATION:
The State of Hawaii should consider the development of a new Aloha Stadium. Based upon the results of our market and facility analysis, Victus Advisors recommends that a new Aloha Stadium should have:

- Approximately 35,000 fixed seats

- Significant consideration should be given to designing the seating bowl, stage configuration, lighting and electrical, and rigging capacities to drive maximum value for concert and entertainment performances.

- Premium seating:
  - **Private Suites:** 20 suites with 16 seats each - 18 suites leased annually, 2 reserved for stadium and/or tenant use
  - **Party Suites:** 2 suites with 30 seats each - suites rented on a per event basis
  - **Loge Boxes:** Approximately 200 loge seats (in a configuration of approximately 40 loge boxes with either 4 or 6 seats per box) – boxes leased annually
  - **Club Seats:** 1,200 club seats - seats leased annually
  - **Club Lounge:** At least one (1) upscale lounge area to be used by premium seat buyers, as well as for meeting and banquet rentals on non-event nights

- In order to accommodate international soccer and rugby events, in addition to football, the field dimensions should be at least 120 yards long by 80 yards wide.

As previously mentioned in the report and above, current stadium events are using below 35,000 seats on average. Based on our research and feedback from interviewees, Victus recommends that a seating capacity of no more than 35,000, which would be ideal to accommodate top concerts, motor sports, highly anticipated UH football or Hawaii Bowl matchups, or highly attended international friendlies.
### COMPARABLE STADIUMS: CAPACITY & PREMIUM

<table>
<thead>
<tr>
<th>Stadium</th>
<th>Seating Capacity</th>
<th>Suites</th>
<th>Loge Boxes</th>
<th>Club Seats</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Inventory</td>
<td>Suite Inventory</td>
<td>Low Annual Price</td>
<td>High Annual Price</td>
</tr>
<tr>
<td>Albertsons Stadium (Boise State)</td>
<td>35,387</td>
<td>39</td>
<td>$43,318</td>
<td>$53,500</td>
</tr>
<tr>
<td>Bulldog Stadium (Fresno State)</td>
<td>40,727</td>
<td>22</td>
<td>$35,000</td>
<td>$35,000</td>
</tr>
<tr>
<td>Canvas Stadium (Colorado State)</td>
<td>41,200</td>
<td>22</td>
<td>$35,000</td>
<td>$45,000</td>
</tr>
<tr>
<td>CFCU Stadium (San Jose State)</td>
<td>30,496</td>
<td>12</td>
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<tr>
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<td>39,224</td>
<td>9</td>
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<td>6</td>
<td>$27,000</td>
<td>$27,000</td>
</tr>
<tr>
<td>Mackay Stadium (Nevada)</td>
<td>30,000</td>
<td>57</td>
<td>$15,400</td>
<td>$50,000</td>
</tr>
<tr>
<td>Nevada Stadium (Las Vegas)</td>
<td>25,100</td>
<td>20</td>
<td>$43,280</td>
<td>$43,280</td>
</tr>
<tr>
<td>War Memorial Stadium (Wyoming)</td>
<td>29,181</td>
<td>10</td>
<td>$24,000</td>
<td>$24,000</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td>35,441</td>
<td>22</td>
<td>$31,000</td>
<td>$37,087</td>
</tr>
<tr>
<td><strong>MEDIAN</strong></td>
<td>36,387</td>
<td>20</td>
<td>$30,000</td>
<td>$43,280</td>
</tr>
</tbody>
</table>

Sources: Stadium operators, Victus research

Notes: (1) Sorted by Stadium in alphabetical order (2) Allegiant Stadium will be the new home of UNLV football in 2020, however since UNLV will be a secondary tenant, the stadium was not included in this analysis (3) SDCCU Stadium was not included as part of this analysis because premium seating was principally available for the former San Diego Chargers of the NFL

Based on the averages and medians shown above, the typical comparable MWC stadium offers just over 35,000 seats, 20 to 22 suites (priced between $31,000 and $44,000 each), 34 loge boxes (priced between $11,500 and $13,150 each), and 700 to 1,200 club seats (priced between $1,400 and $1,575 each).

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### PREMIUM SEATING: SUITES

We analyzed comparative suite inventories relative to total businesses. Based on this metric, we estimated the potential suite inventory for Aloha Stadium to be between 16 and 48 suites. To be conservative, we are recommending 20 private suites (18 to be sold annually and 2 for stadium/tenant use) for a new Aloha Stadium. We are also recommending 2 additional party suites to accommodate larger groups (30+ people) on a nightly rental basis.

<table>
<thead>
<tr>
<th>Stadium</th>
<th>Seating Capacity</th>
<th>Suites</th>
<th>Metropolitan Statistical Area (MSA)</th>
<th>Total Businesses</th>
<th>Businesses Per Suite</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Inventory</td>
<td>Suite Inventory</td>
<td>Low Annual Price</td>
<td>High Annual Price</td>
<td>Total Inventory</td>
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<tr>
<td>Canvas Stadium (Colorado State)</td>
<td>41,200</td>
<td>22</td>
<td>$35,000</td>
<td>$45,000</td>
<td>Fort Collins</td>
</tr>
<tr>
<td>CFCU Stadium (San Jose State)</td>
<td>30,496</td>
<td>12</td>
<td>$15,000</td>
<td>$15,000</td>
<td>San Jose</td>
</tr>
<tr>
<td>Dreamstyle Stadium (New Mexico)</td>
<td>39,224</td>
<td>9</td>
<td>$21,000</td>
<td>$21,000</td>
<td>Albuquerque</td>
</tr>
<tr>
<td>Falcon Stadium (Air Force)</td>
<td>46,692</td>
<td>6</td>
<td>$27,000</td>
<td>$27,000</td>
<td>Colorado Springs</td>
</tr>
<tr>
<td>Mackay Stadium (Nevada)</td>
<td>30,000</td>
<td>57</td>
<td>$15,400</td>
<td>$50,000</td>
<td>Reno</td>
</tr>
<tr>
<td>Nevada Stadium (Las Vegas)</td>
<td>25,100</td>
<td>20</td>
<td>$43,280</td>
<td>$43,280</td>
<td>Logan</td>
</tr>
<tr>
<td>War Memorial Stadium (Wyoming)</td>
<td>29,181</td>
<td>10</td>
<td>$44,000</td>
<td>$44,000</td>
<td>Cheyenne</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td>35,441</td>
<td>22</td>
<td>$31,000</td>
<td>$37,087</td>
<td></td>
</tr>
<tr>
<td><strong>MEDIAN</strong></td>
<td>36,387</td>
<td>20</td>
<td>$30,000</td>
<td>$43,280</td>
<td></td>
</tr>
</tbody>
</table>

Sources: Stadium operators, Victus research

Notes: (1) Sorted by Stadium in alphabetical order (2) Allegiant Stadium will be the new home of UNLV football in 2020, however since UNLV will be a secondary tenant, the stadium was not included in this analysis (3) SDCCU Stadium was not included as part of this analysis because premium seating was principally available for the former San Diego Chargers of the NFL

Hypothetical Honolulu Businesses Per Suite

<table>
<thead>
<tr>
<th>Hypothetical Honolulu Businesses Per Suite</th>
<th>Total Businesses</th>
<th>Suite Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average:</td>
<td>32,201</td>
<td>16</td>
</tr>
<tr>
<td>Median:</td>
<td>32,201</td>
<td>48</td>
</tr>
</tbody>
</table>
# PREMIUM SEATING: LOGE/CLUB SEATS

We analyzed comparative loge box and club seat inventories based on households with annual income over $150,000. We estimated the potential club/seat inventory for a new Aloha Stadium to be between 1,800 and 2,900 loge/club seats. To be conservative, we are recommending approximately 1,400 total loge and club seats at a new Aloha Stadium (1,200 club seats and 200 loge seats in 4- or 6-seat loge box configurations).

<table>
<thead>
<tr>
<th>Stadium</th>
<th>Seating Capacity</th>
<th>Loge Inventory</th>
<th>Loge Low A. Price</th>
<th>Loge High A. Price</th>
<th>Club Inventory</th>
<th>Club Low A. Price</th>
<th>Club High A. Price</th>
<th>Metropolitan Statistical Area (MNA)</th>
<th>HH With Income Over $150K Per Seat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albertsons Stadium (Boise State)</td>
<td>38,387</td>
<td>48</td>
<td>$13,200</td>
<td>$16,000</td>
<td>832</td>
<td>$2,286</td>
<td>$3,000</td>
<td>Boise</td>
<td>26,004</td>
</tr>
<tr>
<td>Modesto Stadium (Fresno State)</td>
<td>46,727</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Fresno</td>
<td>34,153</td>
</tr>
<tr>
<td>Coors Stadium (Coloaudia State)</td>
<td>41,203</td>
<td>43</td>
<td>$9,300</td>
<td>$16,000</td>
<td>1099</td>
<td>$1,300</td>
<td>$2,300</td>
<td>Fort Collins</td>
<td>21,784</td>
</tr>
<tr>
<td>SDCCU Stadium (San Jose State)</td>
<td>38,458</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3,545</td>
<td>$200</td>
<td>$700</td>
<td>San Jose</td>
<td>272,774</td>
</tr>
<tr>
<td>Driller Stadium (New Mexico)</td>
<td>38,014</td>
<td>-</td>
<td>-</td>
<td>1,937</td>
<td>588</td>
<td>$60</td>
<td>$53</td>
<td>Albuquerque</td>
<td>33,503</td>
</tr>
<tr>
<td>Falcon Stadium (Air Force)</td>
<td>46,692</td>
<td>-</td>
<td>-</td>
<td>621</td>
<td>$1,825</td>
<td>$1,825</td>
<td>$1,825</td>
<td>Colorado Springs</td>
<td>36,865</td>
</tr>
<tr>
<td>Mountain Stadium (Nevada)</td>
<td>38,985</td>
<td>34</td>
<td>$8,100</td>
<td>$8,100</td>
<td>234</td>
<td>$1,325</td>
<td>$1,325</td>
<td>Reno</td>
<td>23,731</td>
</tr>
<tr>
<td>McKend Storm (Nevada)</td>
<td>25,160</td>
<td>20</td>
<td>$11,300</td>
<td>$11,300</td>
<td>700</td>
<td>$1,325</td>
<td>$1,325</td>
<td>Logan</td>
<td>2,350</td>
</tr>
<tr>
<td>Air Force Memorial Stadium (Wyoming)</td>
<td>25,184</td>
<td>-</td>
<td>-</td>
<td>311</td>
<td>$2,700</td>
<td>$2,700</td>
<td>$2,700</td>
<td>Cheyenne</td>
<td>3,450</td>
</tr>
<tr>
<td>AVERAGE</td>
<td>38,441</td>
<td>34</td>
<td>$17,151</td>
<td>$12,861</td>
<td>1,158</td>
<td>$1,231</td>
<td>$1,780</td>
<td></td>
<td>28,014</td>
</tr>
<tr>
<td>MEDIAN</td>
<td>38,387</td>
<td>34</td>
<td>$11,451</td>
<td>$13,100</td>
<td>798</td>
<td>$1,413</td>
<td>$1,075</td>
<td></td>
<td>26,014</td>
</tr>
</tbody>
</table>

Sources: Stadium operators, Victrus research

Notes: (1) Sorted by Stadium in alphabetical order (2) Allegiant Stadium will be the new home of UNLV football in 2020, however since UNLV will be a secondary tenant, the stadium was not included in this analysis (3) SDCCU Stadium was not included as part of this analysis because premium seating was principally available for the former San Diego Chargers of the NFL

---

## 8. OPERATING REVENUE & EXPENSE PROJECTIONS

Hypothetical Honolulu HH With Income Over $150K Per Seat

<table>
<thead>
<tr>
<th>HH With Income Over $150K</th>
<th>Club/Loge Seat Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>67,574</td>
</tr>
<tr>
<td>Median</td>
<td>67,574</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hypothetical Honolulu HH With Income Over $150K Per Seat</th>
<th>Club/Loge Seat Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average:</td>
<td>67,574</td>
</tr>
<tr>
<td>Median:</td>
<td>67,574</td>
</tr>
<tr>
<td>HH With Income Over $150K</td>
<td>1,884</td>
</tr>
<tr>
<td>Club/Loge Seat Inventory</td>
<td>2,884</td>
</tr>
</tbody>
</table>

Draft - Subject to Change
KEY ASSUMPTIONS

In addition to the event/attendance assumptions developed earlier in this report, the following key assumptions were utilized by Victus Advisors in order to develop financial operating projections for a new Aloha Stadium:

- The stadium will be owned by the public sector and exempt from property taxes.
- The stadium will be operated by the Hawaii Stadium Authority and a professional concessions operator will be responsible for catering and hospitality.
- The facility will offer competitive rental rates and aggressively market to 3rd-party events.
- The stadium will have approximately 35,000 fixed seats.
- For premium seating inventory, the stadium will have approximately twenty (20) private suites (18 marketed annually, 2 reserved), two (2) party suites, forty (40) loge boxes with 200 total seats, and 1,200 club seats. To be conservative, we have assumed that 80% of sellable inventory would actually be leased annually, and we have excluded per-game inventory (i.e. party suites).
- These projections are based on current market circumstances, and therefore assume that there will be no major changes to the Honolulu event market or available facilities.
- There will be an increase in event rentals, attendance, food and beverage sales, and parking revenue due to the expected new events coming from concerts and sports.
- A new stadium will sell annual naming rights as well as significantly increased corporate sponsorship opportunities.
- New premium seat and sponsorship/naming revenue will be subject to sales commissions.
- The Stadium Authority will fund an annual capital reserve sourced from operating income.

FINANCIAL PROJECTIONS

In a stabilized year of operations, it is estimated that the operations of a new Aloha Stadium could generate approximately $11.1 Million in annual net operating income after funding for a long-term capital reserve* and prior to any revenue sharing with the stadium’s primary tenant**.

*It is standard in the industry to annually put aside at least 0.5% of the total stadium development cost into a reserve fund for future capital improvements.

**Based on our industry experience, it should be noted that it is possible that several of the new revenue streams could be shared with the primary tenant, such as stadium naming rights, advertising & sponsorships, and luxury seating premiums.

<table>
<thead>
<tr>
<th>FY 2019</th>
<th>Increment from New</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aloha Stadium</td>
<td>Aloha Stadium Operations</td>
</tr>
<tr>
<td>Revenues: Swap Meet (1)</td>
<td>$4,269,859</td>
<td>$0</td>
</tr>
<tr>
<td>Parking (net)</td>
<td>$1,904,311</td>
<td>$576,000</td>
</tr>
<tr>
<td>Food &amp; Beverage (net)(3)</td>
<td>$2,232,665</td>
<td>$734,540</td>
</tr>
<tr>
<td>Rent</td>
<td>$1,769,753</td>
<td>$625,000</td>
</tr>
<tr>
<td>Stadium Naming Rights (net)(3)</td>
<td>$0</td>
<td>$1,275,000</td>
</tr>
<tr>
<td>Advertising &amp; Sponsorships (net)(3)</td>
<td>$451,864</td>
<td>$3,373,136</td>
</tr>
<tr>
<td>Interest</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Luxury Seating Premiums (net)(3)</td>
<td>$0</td>
<td>$2,898,280</td>
</tr>
<tr>
<td>Stadium Tours</td>
<td>$498</td>
<td>$498</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$255,810</td>
<td>$255,810</td>
</tr>
<tr>
<td>Total - Net Revenue:</td>
<td>$10,884,760</td>
<td>$8,572,956</td>
</tr>
</tbody>
</table>

Expenses:

<table>
<thead>
<tr>
<th></th>
<th>FY 2019</th>
<th>Increment from New</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aloha Stadium</td>
<td>Aloha Stadium Operations</td>
<td></td>
</tr>
<tr>
<td>Personal Services</td>
<td>$4,817,210</td>
<td>$24,670</td>
<td>$4,841,880</td>
</tr>
<tr>
<td>Supplies</td>
<td>$299,688</td>
<td>($29,969)</td>
<td>$269,719</td>
</tr>
<tr>
<td>Utilities</td>
<td>$1,071,024</td>
<td>($107,102)</td>
<td>$963,922</td>
</tr>
<tr>
<td>Repairs &amp; Maintenance</td>
<td>$214,014</td>
<td>($21,401)</td>
<td>$192,613</td>
</tr>
<tr>
<td>Services On A Fee Basis</td>
<td>$574,439</td>
<td>($57,444)</td>
<td>$516,995</td>
</tr>
<tr>
<td>Central Services Assessment</td>
<td>$558,355</td>
<td>($55,836)</td>
<td>$502,520</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$323,079</td>
<td>($32,308)</td>
<td>$290,771</td>
</tr>
<tr>
<td>Total - Expenses:</td>
<td>$7,657,809</td>
<td>($279,381)</td>
<td>$7,378,428</td>
</tr>
</tbody>
</table>

Net Operating Income: $3,026,951 | $9,852,337 | $12,879,288
Less: Annual Capital Reserve: ($1,750,000)
Net After Capital Reserve Funds: $11,129,288


Notes: (1) It is expected that Swap Meet revenues would remain relatively stable in a new stadium (2) Represents gross F&B sales less direct cost of sales and direct labor costs (3) Conservatively discounted by 15% to account for 3rd-party sales commissions (4) Represents new naming rights for the entire stadium, not just the field (5) It is possible that revenue from luxury seating premiums could be shared with the primary tenant (UH Athletics), however the model shown above is prior to any tenant revenue sharing.
**INCREMENTAL REVENUES**

Incremental revenue generated by the proposed new stadium is expected to consist primarily of increased rent, parking, and food and beverage revenues due to an increase of events such as concerts and other sports events, as well as new revenue streams created by luxury seating premiums and stadium naming rights/sponsorships.

**RENTAL INCOME**

In addition to the current tenants and events already held at Aloha Stadium, we have conservatively assumed that a new Aloha Stadium can attract an additional 10 concert, entertainment act, and international sporting events, with rental rates per event averaging approximately $62,500 per event based on industry standards.

**PARKING**

We have assumed incremental parking revenues to be just over $575,000 with parking rates at $16.00 per car for professional sports events and concerts.

**FOOD & BEVERAGE**

We used incremental attendance of 180,000, estimated to be associated with the incremental event activity described above, and to be conservative we used a conservative per capita sales of food and beverage of between $11 and $12 per event attended to calculate new food and beverage revenue. Although it should be noted that per caps are often significantly higher in new stadiums with modern food operations and menus.

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**INCREMENTAL EXPENSES**

Incremental expenses generated by the proposed new stadium are expected to decrease due to the decreased square footage of the stadium (676,038 ft.² to 635,000 ft.², or a 6% decrease) as well as the decrease in seating capacity (50,000 to approximately 35,000, or 30%). Therefore, to be conservative, we have decreased certain expense line items by 10%.

**PERSONAL SERVICES**

Although salaries for personal services were initially decreased by 10% like the other line items, we added back additional salaries to account for an increase in staffing for the premium seating areas. The industry standard for premium seating staff salary estimation is $300 per premium seat. Since we are projecting 1,688 new premium seats, we added back $506,400 in projected personal services expenses.

**OTHER BUDGET RECOMMENDATIONS**

Current industry best practices for long-term capital needs is to annually contribute an amount equal to at least 0.50% of hard construction costs. According to the State of Hawaii, the proposed new Aloha Stadium could cost in excess of $350 million, therefore it is recommended that the State set aside approximately $1.75 million per year in a capital reserve fund, increasing that amount annually to account for inflation. This capital reserve fund can be drawn upon to pay for necessary capital maintenance as the facility ages.
**PREMIUM SEATING REVENUE - PRIVATE SUITES**

We analyzed comparative suite revenues based on total businesses. We estimated the potential suite revenue for a new Aloha Stadium to be between $1.9M and $2.1M. Based upon comparable venues and a market penetration analysis, we believe maximum overall private suite revenue could be $1.5M. We have also deducted a conservative 15% cost-of-sales for sales commissions in our financial model.

### Stadiums

<table>
<thead>
<tr>
<th>Stadium</th>
<th>Seating Capacity</th>
<th>Suite Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boise</td>
<td>36,387</td>
<td>25,277</td>
</tr>
<tr>
<td>Fresno</td>
<td>40,727</td>
<td>32,980</td>
</tr>
<tr>
<td>Fort Collins</td>
<td>41,280</td>
<td>16,533</td>
</tr>
<tr>
<td>San Jose</td>
<td>30,456</td>
<td>19,620</td>
</tr>
<tr>
<td>Albuquerque</td>
<td>21,224</td>
<td>31,383</td>
</tr>
<tr>
<td>Colorado Springs</td>
<td>46,682</td>
<td>24,774</td>
</tr>
<tr>
<td>Reno</td>
<td>30,933</td>
<td>17,100</td>
</tr>
<tr>
<td>Logan</td>
<td>25,100</td>
<td>3,027</td>
</tr>
<tr>
<td>Cheyenne</td>
<td>25,181</td>
<td>4,070</td>
</tr>
<tr>
<td>Average</td>
<td>38,441</td>
<td>28,053</td>
</tr>
<tr>
<td>Median</td>
<td>36,387</td>
<td>24,774</td>
</tr>
</tbody>
</table>

Sources: Envi, Stadium operators, Vicus research

Notes: (1) Sorted by Stadium in alphabetical order (2) Potential Suite Revenue is based on the average between the Low Annual Price and the High Annual Price multiplied by the Suite Inventory. (3) Allegiant Stadium will be the new home of UNLV football in 2020, however since UNLV will be a secondary tenant, the stadium was not included in this analysis (4) SDCCU Stadium was not included as part of this analysis because premium seating was principally available for the former San Diego Chargers of the NFL

**Hypothetical Honolulu Suite Revenue Per Business**

<table>
<thead>
<tr>
<th>Potential Suite Revenue Per Suite</th>
<th>Total Businesses</th>
<th>Potential Suite Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>32,201</td>
<td>$2,142,056</td>
</tr>
<tr>
<td>Median</td>
<td>32,201</td>
<td>$1,936,906</td>
</tr>
</tbody>
</table>

**PREMIUM SEATING REVENUE - LOGE/CLUB**

We analyzed comparative loge club seat revenues based on households with income over $150K. We estimated the potential loge box/club seat revenue for a new Aloha Stadium to be between $4.9M and $8.6M. We believe maximum overall club/loge revenue could be $3.1M. We have also deducted a conservative 15% cost-of-sales for sales commissions in our financial model.

### Stadiums

<table>
<thead>
<tr>
<th>Stadium</th>
<th>Seating Capacity</th>
<th>Loge Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boise</td>
<td>36,387</td>
<td>$2,879,608</td>
</tr>
<tr>
<td>Fresno</td>
<td>40,727</td>
<td>$3,178,178</td>
</tr>
<tr>
<td>Fort Collins</td>
<td>41,280</td>
<td>$2,915,203</td>
</tr>
<tr>
<td>San Jose</td>
<td>30,456</td>
<td>$2,774,194</td>
</tr>
<tr>
<td>Albuquerque</td>
<td>21,224</td>
<td>$3,027,006</td>
</tr>
<tr>
<td>Colorado Springs</td>
<td>46,682</td>
<td>$2,986,591</td>
</tr>
<tr>
<td>Reno</td>
<td>30,933</td>
<td>$2,221,233</td>
</tr>
<tr>
<td>Logan</td>
<td>25,100</td>
<td>$2,002,000</td>
</tr>
<tr>
<td>Average</td>
<td>38,441</td>
<td>$2,926,000</td>
</tr>
<tr>
<td>Median</td>
<td>36,387</td>
<td>$2,774,194</td>
</tr>
</tbody>
</table>

Sources: Envi, Stadium operators, Vicus research

Notes: (1) Sorted by Stadium in alphabetical order (2) Potential Club/Loge Revenue is based on the average between the Low Annual Price and the High Annual Price multiplied by the Loge Boxes and Clubs Seats Inventory, respectively. (3) Allegiant Stadium will be the new home of UNLV football in 2020, however since UNLV will be a secondary tenant, the stadium was not included in this analysis (4) SDCCU Stadium was not included as part of this analysis because premium seating was principally available for the former San Diego Chargers of the NFL

**Hypothetical Honolulu Club/Loge Revenue**

<table>
<thead>
<tr>
<th>Potential Club/Loge Revenue Per Seat (1,400)</th>
<th>HH With Income Over $150K</th>
<th>Potential Club/Loge Seat (1,400)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>$8,525,718</td>
<td>$3,918,342</td>
</tr>
<tr>
<td>Median</td>
<td>67,574</td>
<td>4,996,491</td>
</tr>
</tbody>
</table>

Draft - Subject to Change
Based on our analysis of premium seating in comparative markets, we estimate that the following pricing model would be appropriate for a new Aloha Stadium’s annual premium seating:

- 18 sellable 16-person suites priced at $80,000 per suite (note: total suite inventory would be 22, which includes 2 reserved for state/university and 2 party suites sold on a per-game basis)
- 40 4-to-6 person loge boxes priced at $17,500 per box
- 1,200 club seats priced at $2,000 per seat

This pricing leads to potential gross premium seating revenue of $4,540,000 prior to sales commissions and if 100% of the available inventory is sold.

<table>
<thead>
<tr>
<th>Premium Product</th>
<th>Sellable Inventory</th>
<th>Total Seats</th>
<th>Average Price Per Suite/Box</th>
<th>Average Price Per Seat</th>
<th>Total Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Suites</td>
<td>18</td>
<td>288</td>
<td>$80,000</td>
<td>$5,000</td>
<td>$1,440,000</td>
</tr>
<tr>
<td>Loge Boxes</td>
<td>40</td>
<td>200</td>
<td>$17,500</td>
<td>$3,500</td>
<td>$700,000</td>
</tr>
<tr>
<td>Club Seats</td>
<td>1,200</td>
<td>1,200</td>
<td>-</td>
<td>$2,000</td>
<td>$2,400,000</td>
</tr>
</tbody>
</table>

TOTAL: 1,688 $2,690 $4,540,000

STADIUM NAMING RIGHTS DEAL

Six (6) of the other 10 football stadiums in the Mountain West Conference (not including Allegiant Stadium) have a multi-year naming rights deals for the stadium, as seen below. These deals range from $350,000 to $2.5M per year. However, on the next slide we conducted analysis showing the potential market value of a Honolulu-based stadium naming rights deal based on market size.

<table>
<thead>
<tr>
<th>Stadium</th>
<th>University</th>
<th>Year Sold</th>
<th>Term (Yrs)</th>
<th>Total Value</th>
<th>Annual Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maverik Stadium</td>
<td>Utah State</td>
<td>2015</td>
<td>18</td>
<td>$6,300,000</td>
<td>$350,000</td>
</tr>
<tr>
<td>Canvas Stadium</td>
<td>Colorado State</td>
<td>2016</td>
<td>15</td>
<td>$37,700,000</td>
<td>$2,513,333</td>
</tr>
<tr>
<td>Albertsons Stadium</td>
<td>Boise State</td>
<td>2014</td>
<td>15</td>
<td>$12,500,000</td>
<td>$833,333</td>
</tr>
<tr>
<td>Dreamstyle Stadium</td>
<td>New Mexico</td>
<td>2017</td>
<td>10</td>
<td>$10,000,000</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>CEFCU Stadium</td>
<td>San Jose State</td>
<td>2016</td>
<td>15</td>
<td>$8,700,000</td>
<td>$580,000</td>
</tr>
<tr>
<td>SDCCU Stadium</td>
<td>San Diego State</td>
<td>2017</td>
<td>4</td>
<td>$2,000,000</td>
<td>$500,000</td>
</tr>
</tbody>
</table>

Average: 2016 15 $12,866,667 $962,778

Median: 2016 15 $9,350,000 $706,867

Source: Victus research
Notes: (1) Sorted by Annual Value in descending order (2) Allegiant Stadium’s primary tenant will be the NFL’s Las Vegas Raiders and as a result was not included in this analysis
We analyzed comparative stadium naming rights deals based on market size. We estimated a potential annual naming rights deal to be between $1.1M and $2M. To be conservative, we are estimating that the annual naming rights for a new Aloha Stadium will sell for $1.5M (prior to sales commissions, conservatively estimated at 15%).

<table>
<thead>
<tr>
<th>Stadium</th>
<th>University</th>
<th>Year Sold (Yrs)</th>
<th>Term Total Value</th>
<th>Annual Value</th>
<th>MSA Population</th>
<th>Annual Dollars Per Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maverick Stadium</td>
<td>Utah State</td>
<td>2015</td>
<td>18</td>
<td>$6,300,000</td>
<td>Utah State</td>
<td>$2.40</td>
</tr>
<tr>
<td>Canvas Stadium</td>
<td>Colorado State</td>
<td>2016</td>
<td>15</td>
<td>$7,700,000</td>
<td>Colorado State</td>
<td>$2.67</td>
</tr>
<tr>
<td>Albertsons Stadium</td>
<td>Boise State</td>
<td>2014</td>
<td>15</td>
<td>$12,500,000</td>
<td>Boise City</td>
<td>$1.11</td>
</tr>
<tr>
<td>Dreamstyle Stadium</td>
<td>New Mexico</td>
<td>2017</td>
<td>10</td>
<td>$10,000,000</td>
<td>Albuquerque</td>
<td>$1.07</td>
</tr>
<tr>
<td>UCFCU Stadium</td>
<td>San Jose State</td>
<td>2016</td>
<td>15</td>
<td>$8,700,000</td>
<td>San Jose</td>
<td>$0.29</td>
</tr>
<tr>
<td>SDCCU Stadium</td>
<td>San Diego State</td>
<td>2017</td>
<td>4</td>
<td>$2,000,000</td>
<td>San Diego</td>
<td>$0.15</td>
</tr>
<tr>
<td><strong>Average:</strong></td>
<td></td>
<td>2016</td>
<td>15</td>
<td>$12,866,667</td>
<td></td>
<td>$2.00</td>
</tr>
<tr>
<td><strong>Median:</strong></td>
<td></td>
<td>2016</td>
<td>15</td>
<td>$9,350,000</td>
<td></td>
<td>$1.09</td>
</tr>
</tbody>
</table>

Sources: Eson, Victor research
Notes: (1) Sorted by Annual Dollars Per Resident in descending order; (2) Life term is estimated to be 30 years, or the approximate useful life of a collegiate athletic facility; (3) Allegiant Stadium’s primary tenant is the Oakland Raiders and as a result was not included in this analysis

<table>
<thead>
<tr>
<th>Hypothetical Hawaii Annual Dollars by Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Dollars</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Average:</td>
</tr>
<tr>
<td>Median:</td>
</tr>
</tbody>
</table>

SPONSORSHIPS & ADVERTISING

STADIUM NAMING RIGHTS

Based on our comparative analysis and industry expertise, we are conservatively estimating that the naming rights for a new Aloha Stadium could sell for $1.5M annually in the Honolulu market.

FOUNDING PARTNERSHIPS

Founding partners are multiple companies that form the top tier of sponsors, excluding stadium naming rights, at a new or renovated sports venue. These companies can help properties offset the cost of construction or capital improvements by making a significant financial contribution.

We recommend that the Stadium Authority targets at least 4 founding partners, with the total sponsorship revenue equaling the annual naming rights value. We therefore project that founding partner revenues will total $1.5M.

OTHER SPONSORSHIPS

Due to the increase in sponsorship inventory that currently does not exist in Aloha Stadium, such as increased static signage, flexible format LED signs, field-level digital boards, etc., there should be a significant increase in other sponsorship revenue. The remaining sponsorships should account for an additional 50% of total sponsorship revenue, at $3.0M.
## CONTENTS

<table>
<thead>
<tr>
<th>RECOMMENDED PHASE I PROGRAM</th>
<th>101</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITE OPPORTUNITY</td>
<td>109</td>
</tr>
<tr>
<td>ECONOMIC &amp; DEMOGRAPHIC DRIVERS</td>
<td>114</td>
</tr>
<tr>
<td>MARKET ANALYSIS</td>
<td></td>
</tr>
<tr>
<td>- Apartments</td>
<td>121</td>
</tr>
<tr>
<td>- Condominiums</td>
<td>127</td>
</tr>
<tr>
<td>- Retail</td>
<td>134</td>
</tr>
<tr>
<td>- Office</td>
<td>141</td>
</tr>
<tr>
<td>- Hotel</td>
<td>147</td>
</tr>
<tr>
<td>APPENDIX</td>
<td></td>
</tr>
<tr>
<td>- I: Residual Land Value Analysis</td>
<td>155</td>
</tr>
<tr>
<td>- II: Apartment Demand Analysis</td>
<td>158</td>
</tr>
<tr>
<td>- III: Condominium Demand Analysis</td>
<td>161</td>
</tr>
<tr>
<td>- IV: Retail Demand Analysis</td>
<td>163</td>
</tr>
<tr>
<td>- V: Office Demand Analysis</td>
<td>165</td>
</tr>
<tr>
<td>- VI: Hotel Demand Analysis</td>
<td>169</td>
</tr>
<tr>
<td>DISCLAIMERS</td>
<td>171</td>
</tr>
</tbody>
</table>
EXECUTIVE SUMMARY

SITE ASSESSMENT

The subject site reflects a unique opportunity to create a vibrant and dynamic mixed-use district anchored by the redeveloped Aloha Stadium.

The site can draw from the strong existing characteristics of a local market benefiting from proximity to Pearl Harbor and future transit access. The stadium can serve as the key anchor to catalyze growth, create a market, and enable attractive pricing, positioning, and absorption that would otherwise not be feasible without the stadium anchor.

Phase I is critical to defining the project’s vision and character, and laying the foundation for long-term success across multiple phases. A well-balanced mix of uses, outlined below, can leverage the stadium’s magnetism to attract a critical mass and define the district as one of Oahu’s premier living, dining/shopping, and tourism destinations.

We define the local submarket as Leeward Honolulu, relying on CoStar-defined boundaries. Refer to page 21 for a map of the submarket.

PHASE I OPPORTUNITY

RETAIL

Existing retail in the local area predominantly serves local households and employees, and not the broader tourist market. Notable clusters of retail include the Pearlridge Shopping Center, a 1.1 million square foot super-regional mall featuring midrange boutiques and national chains. While still boasting low vacancy (4%) and strong rents ($3.40/SF/month NNN), the Leeward Honolulu submarket lags behind the more tourist-serving Central Honolulu submarket.

A vibrant and exciting retail destination is a crucial part of the site’s success, helping to create an attractive destination that not only serves local and onsite households and visitors to the stadium, but that also draws in tourists and households from across the Island that may not have otherwise considered visiting the submarket.

We recommend programming up to 250,000 net square feet of retail space by year four of Phase I, including a grocer, several restaurants, a small selection of hard and soft goods boutiques, and significant entertainment/services. We estimate monthly NNN rents of $5.00 per square foot, above rates for local-serving spaces in Leeward Honolulu but at a discount to the top retail spaces in Waikiki.

A thoughtfully-curated selection of tenants will play a major role in driving success not only for the retail component, but also setting the stage for the experience provided by the project overall. We recommend selecting local, non-chain restaurants, bars, boutiques, and entertainment spaces that create an authentic, locally-conscious, and destination-worthy retail experience that pays homage to the legacy of the island and creates a strong sense of place that continually draws visitors and locals to the site.

We recommend configuring as much space as possible in the ground floors of the component uses, with the remaining space distributed among “podiums” connecting the various buildings, to create a cohesive and walkable retail district.

Of the recommended retail space, 4.0 million net square feet should be programmed as ground-floor mixed-use space within larger scale development projects and included in the evaluation of value for those developments.

The value of the remaining 166,000 net square feet of retail space, to be spread across the rest of Phase I, would have a market value of $183.6 million and residual land value of $27.9 million.

APARTMENTS

Despite strong underlying fundamentals, the local submarket is supply-constrained, with no new supply additions in decades.

Given the site’s high-density, mixed-use character, there is a strong opportunity for the site to tap into the submarket’s pent-up demand and deliver new, high-quality apartments that appeal to young and mature professionals, lifestyle renters-by-choice, and military households.

We estimate achievable pricing of $2,875 for an average-sized, 810-square foot unit, or $3.55 per square foot.

We recommend delivering 325 total apartment units beginning in year one of Phase I, to be absorbed over three years.

We estimate a total market value of $215.8 million for the apartments, and a residual land value of $27.9 million.
EXECUTIVE SUMMARY (CONT.)

PHASE I OPPORTUNITY (CONT.)

CONVENTIONAL CONDOMINIUMS

- There is strong demand across Oahu, and within urban locations, for conventional for-sale product that appeals to primary homebuyers, including singles, couples, and families, rather than to a high-end or second-home buyer. The local Leeward Honolulu submarket, in particular, is a strong existing destination for conventional housing, with demonstrated demand for condominiums at more reasonable price points. The existing supply is predominantly older in age, and is characterized by apartment-quality finishes and minimal amenities.

- The site has an attractive opportunity to deliver conventional condominiums targeted to non-high-end households. We recommend average pricing of approximately $590k, given an average unit size of 750 square feet ($785 per square foot).

- We recommend delivering 225 units, beginning in Phase I, to be absorbed over three years.

- We estimate a total market value of $161.8 million for the conventional condominiums, and a residual land value of $18.6 million, including the value of ground-floor retail space.

- We recommend pricing premium condos at a steep discount to new product in Waikiki, Kaka'ako, and Ala Moana. Premium condos at the site could achieve average pricing of $1.2 million for an average unit size of 1,010 square feet ($1,180 per square foot).

- We recommend delivering 150 premium condos, beginning in year three, when leading uses at the site have begun to stabilize and the overall project has established a strong brand, sense of place, and critical mass.

- We estimate the premium condominiums to have a total market value of $195.9 million and a residual land value of $21.8 million, including the value of ground-floor retail space.

Note: While recent for-sale condominium development has focused on fee simple properties, there is an opportunity to develop for-sale condominiums as leasehold properties, especially given the site would be owned by the state (not a private owner). Additionally, leasehold condos could be offered with a long lease term of 99 years. It is our understanding that there is proposed legislation that will allow for these lease terms, mitigating the challenges faced by typical leasehold condos that offer shorter lease terms. Moreover, it is likely that leasehold condo product on state-owned land will become increasingly common in Hawaii, as the state is evaluating ways to offer leasehold residences on state-owned land as a way to address the growing undersupply of conventional residential product in Hawaii.

EXECUTIVE SUMMARY (CONT.)

PHASE I OPPORTUNITY (CONT.)

OFFICE

- The Leeward Honolulu submarket is one of the more attractive office locations across Oahu, consistently outperforming the CBD in top tenant attraction, rents, and occupancy.

- However, the office market on Oahu faces several headwinds, including the relatively moderate job growth in the Honolulu MSA compared to other major metros nationally, the large volume of existing supply and underutilized office spaces, and the absence of a significant number of major employers that demand large spaces. These factors coalesce to temper the overall potential for office space at the site, relative to other uses; we estimate market support for up to 100,000 square feet of office space in Phase I.

- Although office space does not generate a significantly positive residual land value (see below), we believe the presence of office space at the subject site adds value to complementary uses by creating a stronger and comprehensive live/work/play environment. We therefore recommend that office space be value-engineered to be financially feasible, such as by configuring it on the lower floors of mixed-use buildings (e.g., residential or hotel) in order to lower construction costs and result in better integration among the different uses.

- We recommend programming 75,000 square feet of office, slightly less than what the market could support, given both the lower land values for office space relative to other uses, as well as the fact that the demand for this type of office space in Honolulu is concentrated for tenants that typically require smaller office spaces. This increases the overall number of leases that need to be signed and could potentially complicate the site’s absorption.

- We estimate that 75,000 net square feet of office space would have a market value of $73.3 million, but a residual land value that is almost neutral, at $587,000. Nonetheless, the inclusion of office would lead to higher land values for the complementary uses.

- Oahu continues to be one of the most attractive and healthy hotel markets in the country, driven by the vast draw of Hawaii’s natural beauty and lifestyle amenities. Within Oahu, Waikiki is the preferred hotel submarket, but other resort areas with unique amenities or activities are becoming increasingly viable hotel destinations that offer a value alternative to Waikiki. While Leeward Honolulu is not a particularly desirable hotel submarket, the mixed-use subject site could significantly alter the area’s desirability from a hospitality perspective.

- We believe that a hotel use would be an excellent fit within Phase I of the project, both drawing from and contributing to the vibrancy of the sports-anchored mixed-use district. In particular, a hotel at the site could serve the over 1.5 million annual visitors to the stadium; further, the project overall could serve as a significant catalyst for growth in visitation, attracting tourists and visitors to the site’s retail and mixed-use district who would otherwise not have considered visiting Leeward Honolulu.

- In light of these trends, our demand analysis suggests support for up to 240 hotel rooms at the project in Phase I. We recommend delivering the hotel in year three, as the residential and retail uses have begun to stabilize and the overall project has established a strong brand, sense of place, and critical mass.

- From a financial perspective, we estimate the hotel to have a market value of $154.6 million, and a residual land value of $38.9 million.
RECOMMENDED PHASE I PROGRAM
SCALE & TIMING

<table>
<thead>
<tr>
<th>LAND USE</th>
<th>AVG. NET UNIT SF</th>
<th>EFFICIENCY</th>
<th>AVG. GROSS UNIT SF</th>
<th>CUMULATIVE SUPPORTED DEVELOPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LAND USE</td>
</tr>
<tr>
<td>Apartments (Units)</td>
<td>810</td>
<td>80%</td>
<td>1,013</td>
<td>100</td>
</tr>
<tr>
<td>Condos - Conventional (Units)</td>
<td>750</td>
<td>80%</td>
<td>938</td>
<td>83,500</td>
</tr>
<tr>
<td>Condos - Premium (Units)</td>
<td>1,010</td>
<td>80%</td>
<td>1,263</td>
<td>200,000</td>
</tr>
<tr>
<td>Retail (Net SF)</td>
<td>750</td>
<td>80%</td>
<td>938</td>
<td>125,500</td>
</tr>
<tr>
<td>Office (Net SF)</td>
<td>1</td>
<td>90%</td>
<td>1</td>
<td>211,000</td>
</tr>
<tr>
<td>Hotel (Keys)</td>
<td>400</td>
<td>80%</td>
<td>667</td>
<td>240</td>
</tr>
<tr>
<td><strong>Total Supported Gross SF</strong></td>
<td><strong>321,000</strong></td>
<td></td>
<td></td>
<td><strong>1,046,500</strong></td>
</tr>
</tbody>
</table>

SUMMARY OF RECOMMENDED PHASE I PROGRAM

<table>
<thead>
<tr>
<th>LAND USE</th>
<th>NET AVG. UNIT SIZE</th>
<th>PRIMARY USE</th>
<th>GROUND- FLOOR TOTAL</th>
<th>PRIMARY USE GROUND- FLOOR TOTAL</th>
<th>MARKET VALUE</th>
<th>LAND VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartments</td>
<td>325 810</td>
<td>263,000</td>
<td>35,000</td>
<td>298,000</td>
<td>$215,794,000</td>
<td>$15,079,000</td>
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<tr>
<td>Condos - Conventional</td>
<td>225 748</td>
<td>168,500</td>
<td>21,000</td>
<td>189,500</td>
<td>$161,808,000</td>
<td>$18,556,000</td>
</tr>
<tr>
<td>Condos - Premium</td>
<td>150 1,010</td>
<td>152,000</td>
<td>20,000</td>
<td>172,000</td>
<td>$195,931,000</td>
<td>$21,848,000</td>
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<tr>
<td>Retail - Lifestyle/Ent.</td>
<td>--  --</td>
<td>166,000</td>
<td>0</td>
<td>166,000</td>
<td>$183,584,000</td>
<td>$27,858,000</td>
</tr>
<tr>
<td>Office</td>
<td>--  75,000</td>
<td>8,000</td>
<td>83,000</td>
<td>83,000</td>
<td>$73,265,000</td>
<td>$687,000</td>
</tr>
<tr>
<td>Hotel</td>
<td>240 400</td>
<td>96,000</td>
<td>0</td>
<td>96,000</td>
<td>$154,578,000</td>
<td>$36,917,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>920,500</strong></td>
<td><strong>84,000</strong></td>
<td><strong>1,044,500</strong></td>
<td><strong>1,148,000</strong></td>
<td><strong>$984,960,000</strong></td>
<td><strong>$120,945,000</strong></td>
</tr>
</tbody>
</table>
POTENTIAL DEVELOPMENT AT BUILD-OUT

We assume a potential full build-out of 3.2 million gross square for market-driven real estate uses at the site.*

Assuming a similar distribution of supported space as is recommended for Phase I, the project could include 1,813 residential units, 216,000 square feet of office, 680,500 square feet of retail, and 621 hotel keys at full build-out.

* This assumes 13 net acres are available for real estate development (after allocations for the stadium, parking, roads, infrastructure, etc.) and a net FAR of 0.1, which amounts to 3.4 million total square feet, less an estimated allocation of 200,000 square feet for civic uses. The maximum development potential will be studied further in the next phase of the analysis.

LAND USE

<table>
<thead>
<tr>
<th>PHASE I</th>
<th>THROUGH BUILD-OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartments (Units)</td>
<td>325</td>
</tr>
<tr>
<td>Condos - Conventional (Units)</td>
<td>225</td>
</tr>
<tr>
<td>Condos - Premium (Units)</td>
<td>150</td>
</tr>
<tr>
<td>Retail (incl. Ground-Floor) (Gross SF)</td>
<td>263,000</td>
</tr>
<tr>
<td>Office (Gross SF)</td>
<td>83,500</td>
</tr>
<tr>
<td>Hotel (Keys)</td>
<td>240</td>
</tr>
<tr>
<td>Total Gross SF</td>
<td>1,236,500</td>
</tr>
</tbody>
</table>

CRITICAL ASSUMPTIONS & SUCCESS FACTORS

► All prices are expressed in constant 2019 dollars.
► The recommended program assumes that the first deliveries can begin as early 2023, with a total absorption period of five years for all uses in Phase I.
► The analysis assumes an average net density of 6:1 FAR across all vertical uses.
► The absorption presented in this analysis reflects an average over the lifespan of each land use at the site. Absorption in individual years may be higher or lower than the average.
► The recommended pricing and absorption, and consequent land values, are only possible if the project creates a distinctive destination offering a cohesive sense of place and a dynamic live-work-play experience.
  » The project should leverage its strongest asset—the redeveloped Aloha Stadium—to anchor the development, attract a critical mass, and serve as a catalyst for growth and market creation.
  » Aloha Stadium can serve as a critical tool to unlock the latent market potential within the Leeward Honolulu submarket and accelerate the neighborhood’s and site’s ability to attract development sooner than it would otherwise—and at higher densities, market values, and land values than would be feasible without the stadium anchor.
► While recent for-sale condominium development has focused on fee simple properties, there is an opportunity to develop for-sale condominiums as leasehold properties, especially given the site would be owned by the state (not a private owner). Additionally, leasehold condos could be offered with a long lease term of 99-years (it is our understanding that there is proposed legislation that will allow for these lease terms), mitigating the challenges faced by typical leasehold condos that offer shorter lease terms. Moreover, it is likely that leasehold condo product on state-owned land will become increasingly common in Hawaii, as the state is evaluating ways to offer leasehold residences on state-owned land as a way to address the growing undersupply of conventional residential product in Hawaii.
► The project’s overall success, including the anchor’s catalytic potential, are only possible under favorable market conditions.
  » While we have taken reasonable effort to develop recommendations that take into account forecasted slowdowns and upcalls across market cycles (driven by national and local third-party economic forecasts), it is difficult, if not impossible, to predict macroeconomic shocks or “black swan” events and their impact on the real estate market.
  » We therefore recommend the key stakeholders to closely monitor macroeconomic conditions as they proceed with the project.
DEMAND FOR REAL ESTATE DEVELOPMENT IS DRIVEN BY REGIONAL GROWTH (JOBS, HHS, ETC.)

A LARGE MIXED-USE DISTRICT PROVIDES GREATER OPPORTUNITIES → REDEFINE A SUBMARKET AND INCREASE ITS SHARE OF REGIONAL DEMAND
MARKET IS ONLY ONE FACTOR FOR SUCCESS OF A NEW SPORTS/ENTERTAINMENT DISTRICT

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>DESCRIPTION</th>
<th>ALOHA STADIUM GRADE</th>
<th>IMPORTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market</td>
<td>Regional Demand Drivers/Fundamentals</td>
<td>B (Average size and growth market, with above average income and wealth)</td>
<td>2</td>
</tr>
<tr>
<td>Submarket</td>
<td>How effectively can this submarket compete for regional demand</td>
<td>A-/B+ (Close proximity to affluent households; however, local area not yet perceived as premier high-density residential, tourism, or shopping/dining destination)</td>
<td>3</td>
</tr>
<tr>
<td>Site Context</td>
<td>Do the characteristics of the site itself (size, topography, transportation, surrounding uses, etc.) support development</td>
<td>A/A- (Excellent highway accessibility at junction of 3 routes; unique, large-scale development opportunity; but, surrounding uses lack prestige)</td>
<td>1</td>
</tr>
</tbody>
</table>
SWOT ANALYSIS

STRENGTHS & OPPORTUNITIES

► Ability to create a cohesive, mixed-use environment
► One of few remaining, large-scale development opportunities in all of Oahu
► Integration with stadium to bring in additional traffic
► Adjacent to multiple highways and Honolulu International Airport
► Future rail station will significantly improve access and bring more visitors
► Close to Joint Base Pearl Harbor-Hickam
► Close to Pearl Harbor National Memorial (approximately 1.7 million visitors annually)
► Potential views of water and surrounding nature from much of the site

WEAKNESSES & THREATS

► Aside from Pearl Harbor, area is otherwise not a primary tourist destination, and will need to find creative and strategic ways to use the stadium and the mix of uses to attract visitors who would not have otherwise considered staying or playing in this part of the island
► Little opportunity for integration with surrounding neighborhoods due to highways circling site
► Area is considered to be a secondary/tertiary location for multifamily, office, and retail uses; however, opportunity for major, mixed-use development to induce new demand

ECONOMIC & DEMOGRAPHIC DRIVERS
REGIONAL EMPLOYMENT GROWTH

Historical and Forecasted Non-Agricultural Employment; Urban Honolulu, HI MSA; 1990-2029 (F)

Historical and Forecasted Non-Agricultural Employment Growth Rates; Urban Honolulu, HI MSA and United States; 1990-2023 (F)

EMPLOYMENT GROWTH BY SECTOR

Source: Moody’s; RCLCO

Victus Advisors LLC | Strategic Market Analysis | Aloha Stadium Redevelopment | 10/23/2019 | 115

Source: Moody’s; RCLCO

Victus Advisors LLC | Strategic Market Analysis | Aloha Stadium Redevelopment | 10/23/2019 | 116
**RELEVANT MARKET AREAS**

**LEEWARD HONOLULU & CENTRAL HONOLULU**

**KEY DEMOGRAPHIC CHARACTERISTICS**

- **% of Household Incomes Above $50,000 (2019)**
  - Leeward Honolulu: 73.0%
  - Central Honolulu: 59.4%
  - Oahu: 70.8%

- **Tenure (2019)**
  - Rent: 45.8%
  - Own: 54.2%

- **Average Household Size (2019)**
  - Leeward Honolulu: 3.51
  - Central Honolulu: 2.57
  - Oahu: 3.13

- **Annual Household Growth Rate**
  - Leeward Honolulu
    - 2000-2010: 3.51
    - 2010-2019: 2.57
    - 2019-2024: 3.13
  - Central Honolulu
    - 2000-2010: 2.2%
    - 2010-2019: 2.2%
    - 2019-2024: 2.2%
  - Oahu
    - 2000-2010: 2.2%
    - 2010-2019: 2.2%
    - 2019-2024: 2.2%
LEEWARD + CENTRAL HONOLULU (PRIMARY MARKET AREA) OAHU

CURRENT CHARACTERISTICS (2019 YTD)

<table>
<thead>
<tr>
<th>Property</th>
<th>Units</th>
<th>Avg. Effective Rent</th>
<th>Vacancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEEWARD + CENTRAL HONOLULU</td>
<td>168</td>
<td>$1,545</td>
<td>5.8%</td>
</tr>
<tr>
<td>OAHU</td>
<td>109</td>
<td>$1,982</td>
<td>6.0%</td>
</tr>
</tbody>
</table>

SHORT-TERM TRENDS (2016-2018)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LEEWARD + CENTRAL HONOLULU</td>
<td>0.9%</td>
<td>4.7%</td>
<td>-66</td>
<td>0</td>
</tr>
<tr>
<td>OAHU</td>
<td>3.1%</td>
<td>5.6%</td>
<td>134</td>
<td>102</td>
</tr>
</tbody>
</table>

LONG-TERM TRENDS (2004-2018)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LEEWARD + CENTRAL HONOLULU</td>
<td>2.5%</td>
<td>4.5%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>OAHU</td>
<td>3.7%</td>
<td>4.8%</td>
<td>90</td>
<td>93</td>
</tr>
</tbody>
</table>

Note: 2019 data through August 4, 2019.
Source: CoStar; RCLCO

Completions, Absorption, Vacancy, and Rent Growth; Primary Market Area; 2004-2019 YTD
**APARTMENT COMPS**

<table>
<thead>
<tr>
<th>MAP KEY</th>
<th>COMMUNITY NAME</th>
<th>YEAR BUILT</th>
<th>MARKET RATE</th>
<th>OCC. RATE</th>
<th>UNITS</th>
<th>OCC. RATE</th>
<th>MARKET RATE</th>
<th>AVERAGE SIZE (SF)</th>
<th>AVERAGE ASKING RENT</th>
<th>AVERAGE ASKING $/SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Villas At Royal Kunia</td>
<td>1983</td>
<td>402</td>
<td>99%</td>
<td>650</td>
<td>99%</td>
<td>650</td>
<td>$1,919</td>
<td>$2.95</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Oasis at Waipahu</td>
<td>1970</td>
<td>406</td>
<td>100%</td>
<td>891</td>
<td>100%</td>
<td>891</td>
<td>$1,889</td>
<td>$2.12</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Kapolei Lofts</td>
<td>2016</td>
<td>389</td>
<td>98%</td>
<td>962</td>
<td>98%</td>
<td>962</td>
<td>$2,676</td>
<td>$2.97</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Kapilina Beach</td>
<td>1965</td>
<td>1457</td>
<td>93%</td>
<td>1,270</td>
<td>93%</td>
<td>1,270</td>
<td>$3,081</td>
<td>$2.53</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Pearl Regency</td>
<td>1981</td>
<td>388</td>
<td>100%</td>
<td>669</td>
<td>100%</td>
<td>669</td>
<td>$1,538</td>
<td>$2.30</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Moanalua Hillside</td>
<td>1968</td>
<td>696</td>
<td>99%</td>
<td>766</td>
<td>99%</td>
<td>766</td>
<td>$3,011</td>
<td>$2.42</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Napili Tower</td>
<td>1969</td>
<td>34</td>
<td>94%</td>
<td>719</td>
<td>94%</td>
<td>719</td>
<td>$2,460</td>
<td>$3.42</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>7000 Hawaii Kai Drive</td>
<td>2016</td>
<td>269</td>
<td>100%</td>
<td>825</td>
<td>100%</td>
<td>825</td>
<td>$2,796</td>
<td>$3.39</td>
<td></td>
</tr>
</tbody>
</table>

**APARTMENT PIPELINE**

<table>
<thead>
<tr>
<th>MAP KEY</th>
<th>PROJECT DEVELOPER</th>
<th>EST. OPENING TOTAL UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNDER CONSTRUCTION</td>
<td>Lilia Yabashi, Brookfield Residential, Oliver McMillan Holdings</td>
<td>2021, 361</td>
</tr>
<tr>
<td>1</td>
<td>Lilia Yabashi</td>
<td>2021 361</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PLANNED/PROPOSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>
ALOHA STADIUM POSITIONING & ACHIEVABLE RENTS

![Diagram showing unit size vs. rent](image)

<table>
<thead>
<tr>
<th>UNIT TYPE</th>
<th>MIX</th>
<th>AVG. UNIT SIZE (SF)</th>
<th>AVG. RENT</th>
<th>AVG. $/SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studio</td>
<td>20.0%</td>
<td>500</td>
<td>$2,050</td>
<td>$4.10</td>
</tr>
<tr>
<td>1BR</td>
<td>30.0%</td>
<td>700</td>
<td>$2,600</td>
<td>$3.71</td>
</tr>
<tr>
<td>2BR</td>
<td>40.0%</td>
<td>950</td>
<td>$3,275</td>
<td>$3.45</td>
</tr>
<tr>
<td>3BR</td>
<td>10.0%</td>
<td>1,200</td>
<td>$3,625</td>
<td>$3.02</td>
</tr>
<tr>
<td>TOTAL/AVG.</td>
<td>100.0%</td>
<td>810</td>
<td>$2,875</td>
<td>$3.55</td>
</tr>
</tbody>
</table>

Source: Axiometrics; CoStar; RCLCO

ALOHA STADIUM CUMULATIVE SUPPORTED APARTMENT DELIVERIES

![Bar chart showing cumulative supported apartment deliveries](image)

Year 1: 171
Year 2: 254
Year 3: 336
Year 4: 419
Year 5: 502

Source: RCLCO
CONDOMINIUM MARKET ANALYSIS

LEEWARD HONOLULU CONDO MARKET TRENDS

Annual Condo Sales in Leeward Honolulu by Price Band

Source: RealQuest; RCLCO

Victus Advisors LLC | Strategic Market Analysis | Aloha Stadium Redevelopment | 10/23/2019 | 127
CENTRAL HONOLULU CONDO MARKET TRENDS

Annual Condo Sales in Central Honolulu by Price Band

CONDOMINIUM COMPS

Note: Reflects sales between August 2018 and August 2019.
Source: New Home Source; Individual Property Websites; MLS; Broker Interviews; RCLCO
CONDOMINIUM PIPELINE

Source: Planning departments; News articles; Broker interviews; RCLCO

---

CONDOMINIUM POSITIONING

Source: New Home Source; Individual Property Websites; MLS; Broker interviews; RCLCO
### Aloha Stadium Supported Cumulative Condo Sales & Pricing Potential

**Source:** RCLCO

#### Conventional

<table>
<thead>
<tr>
<th>UNIT TYPE</th>
<th>MIX</th>
<th>AVG. SF</th>
<th>AVG. PRICE</th>
<th>AVG. $/SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studio</td>
<td>20%</td>
<td>450</td>
<td>$400,000</td>
<td>$889</td>
</tr>
<tr>
<td>Jr. 1BR</td>
<td>15%</td>
<td>550</td>
<td>$460,000</td>
<td>$836</td>
</tr>
<tr>
<td>1BR</td>
<td>25%</td>
<td>750</td>
<td>$560,000</td>
<td>$787</td>
</tr>
<tr>
<td>2BR</td>
<td>30%</td>
<td>925</td>
<td>$700,000</td>
<td>$757</td>
</tr>
<tr>
<td>3BR</td>
<td>10%</td>
<td>1,100</td>
<td>$600,000</td>
<td>$727</td>
</tr>
<tr>
<td>Total/Wtd. Avg.</td>
<td>100%</td>
<td>750</td>
<td>$586,500</td>
<td>$785</td>
</tr>
</tbody>
</table>

#### Premium

<table>
<thead>
<tr>
<th>UNIT TYPE</th>
<th>MIX</th>
<th>AVG. SF</th>
<th>AVG. PRICE</th>
<th>AVG. $/SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studio</td>
<td>10%</td>
<td>550</td>
<td>$750,000</td>
<td>$1,364</td>
</tr>
<tr>
<td>Jr. 1BR</td>
<td>15%</td>
<td>650</td>
<td>$850,000</td>
<td>$1,308</td>
</tr>
<tr>
<td>1BR</td>
<td>25%</td>
<td>850</td>
<td>$1,040,000</td>
<td>$1,224</td>
</tr>
<tr>
<td>2BR</td>
<td>25%</td>
<td>1,100</td>
<td>$1,280,000</td>
<td>$1,164</td>
</tr>
<tr>
<td>3BR</td>
<td>20%</td>
<td>1,400</td>
<td>$1,560,000</td>
<td>$1,114</td>
</tr>
<tr>
<td>4BR</td>
<td>5%</td>
<td>1,800</td>
<td>$1,940,000</td>
<td>$1,078</td>
</tr>
<tr>
<td>Total/Wtd. Avg.</td>
<td>100%</td>
<td>1,010</td>
<td>$1,191,500</td>
<td>$1,180</td>
</tr>
</tbody>
</table>

Note: Prices expressed in constant August 2019 dollars.

Source: RCLCO

### Retail Market Analysis

---

**Victus Advisors LLC | Strategic Market Analysis | Aloha Stadium Redevelopment | 10/23/2019 | 133**
RETAIL MARKET TRENDS

Retail Vacancy

Note: 2019 data as of August 3, 2019. Data represents retail buildings with over 10,000 square feet.
Source: CoStar; RCLCO

Retail Rents

Note: 2019 data as of August 3, 2019. Data represents retail buildings with over 10,000 square feet.
Source: CoStar; RCLCO

COMPETITIVE RETAIL CENTERS

<table>
<thead>
<tr>
<th>MAP KEY</th>
<th>PROPERTY NAME</th>
<th>PROPERTY ADDRESS</th>
<th>YEAR BUILT</th>
<th>PROPERTY TYPE</th>
<th>PARKING SPACE (SP)</th>
<th>SIZE (SF)</th>
<th>VACANT SPACE (SP)</th>
<th>VACANCY RATE</th>
<th>RENT (SF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ala Moana Center</td>
<td>1450 Ala Moana Blvd</td>
<td>1959</td>
<td>Super Regional Mall</td>
<td>9.0</td>
<td>1,051,260</td>
<td>495</td>
<td>0.0%</td>
<td>$114.36</td>
</tr>
<tr>
<td>2</td>
<td>Pearlridge Center</td>
<td>98-180 Kanehameha Hwy</td>
<td>1974</td>
<td>Super Regional Mall</td>
<td>9.2</td>
<td>1,093,939</td>
<td>12,852</td>
<td>1.2%</td>
<td>Withheld</td>
</tr>
<tr>
<td>3</td>
<td>Royal Hawaiian Shopping Center</td>
<td>2201 Kakaako Ave</td>
<td>1979</td>
<td>Power Center</td>
<td>2.1</td>
<td>322,096</td>
<td>5,488</td>
<td>1.7%</td>
<td>N/A</td>
</tr>
<tr>
<td>4</td>
<td>Royal Highlands Center</td>
<td>1000 Kanehameha Hwy</td>
<td>1994</td>
<td>Power Center</td>
<td>4.9</td>
<td>415,200</td>
<td>0.0%</td>
<td>N/A</td>
<td>Withheld</td>
</tr>
<tr>
<td>5</td>
<td>Waialua Plaza Shopping Center</td>
<td>98-1277 Kaahumanu St</td>
<td>1975</td>
<td>Community Center</td>
<td>5.2</td>
<td>151,006</td>
<td>3,774</td>
<td>2.0%</td>
<td>Withheld</td>
</tr>
</tbody>
</table>

Source: CoStar; RCLCO
### RETAIL LEASE COMPS

<table>
<thead>
<tr>
<th>BUILDING ADDRESS</th>
<th>BUILDING NAME</th>
<th>YEAR BUILT</th>
<th>AVERAGE RENT (ANNUAL)</th>
<th>AVERAGE RENT (MONTHLY)</th>
<th>TOTAL AVAILABLE SPACE (SF)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>98-199 Kamehameha Hwy</td>
<td>Pearl Kai Center</td>
<td>1966</td>
<td>$48.00</td>
<td>$4.00</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>98-199 Kamehameha Hwy</td>
<td>Pearl Kai Center</td>
<td>1966</td>
<td>$54.00</td>
<td>$4.50</td>
<td>2,360</td>
<td></td>
</tr>
<tr>
<td>98-199 Kamehameha Hwy</td>
<td>Pearl Kai Center</td>
<td>1966</td>
<td>$60.00</td>
<td>$5.00</td>
<td>2,120</td>
<td></td>
</tr>
<tr>
<td>94-830 Moloalo St</td>
<td>Moloalo Center</td>
<td>1963</td>
<td>$46.20</td>
<td>$3.85</td>
<td>1,421</td>
<td></td>
</tr>
<tr>
<td>91-1001 Kamehameha Hwy</td>
<td>Ewa Photo Marketbl</td>
<td>1963</td>
<td>$45.00</td>
<td>$3.75-4.00</td>
<td>1,000-2,834</td>
<td></td>
</tr>
<tr>
<td>91-1001 Kamehameha Hwy</td>
<td>Ewa Photo Marketbl</td>
<td>1963</td>
<td>$48.00</td>
<td>$4.00</td>
<td>913</td>
<td>Second Floor</td>
</tr>
<tr>
<td>1102-1114 Fort Street Mall</td>
<td>Pantheon Building</td>
<td>1916</td>
<td>$27.00-30.00</td>
<td>$2.25-2.50</td>
<td>710</td>
<td></td>
</tr>
<tr>
<td>1102-1114 Fort Street Mall</td>
<td>Pantheon Building</td>
<td>1916</td>
<td>$21.00-24.00</td>
<td>$1.75-2.00</td>
<td>2,006</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** All rents listed are on a NNN basis.

### RETAIL PIPELINE

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>GROSS SF</th>
<th>DELIVERY YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1235 Kona St</td>
<td>10,000</td>
<td>2019</td>
</tr>
<tr>
<td>Live Work Play Area</td>
<td>170,000</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: CoStar; Google Maps; RCLCO
## RETAIL TARGET MARKETS

<table>
<thead>
<tr>
<th></th>
<th>Grocery &amp; Drug</th>
<th>Restaurants</th>
<th>Hard &amp; Soft Goods</th>
<th>Entertainment &amp; Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Onsite Demand</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apartment &amp; Condo HH</td>
<td>XXX</td>
<td>XX</td>
<td>X</td>
<td>XX</td>
</tr>
<tr>
<td>Employees</td>
<td>XX</td>
<td>XX</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Local Demand</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leeward Honolulu HH</td>
<td>XXX</td>
<td>X</td>
<td>XX</td>
<td>XX</td>
</tr>
<tr>
<td>Central Honolulu HH</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Leeward Honolulu Employees</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Visitors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hotel Guests</td>
<td>X</td>
<td>XXX</td>
<td>X</td>
<td>XXX</td>
</tr>
<tr>
<td>Stadium Visitors</td>
<td>X</td>
<td>XXX</td>
<td>X</td>
<td>XXX</td>
</tr>
</tbody>
</table>

Source: Broker interviews; RCLCO

## ALOHA STADIUM SUPPORTED RETAIL DELIVERIES

### STORE TYPE PHASE 1 SF

<table>
<thead>
<tr>
<th>Store Type</th>
<th>Phase 1 SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery &amp; Drug</td>
<td>37,500</td>
</tr>
<tr>
<td>Restaurants</td>
<td>75,500</td>
</tr>
<tr>
<td>Hard Goods</td>
<td>4,500</td>
</tr>
<tr>
<td>Soft Goods</td>
<td>16,000</td>
</tr>
<tr>
<td>Entertainment &amp; Services</td>
<td>116,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>250,000</strong></td>
</tr>
</tbody>
</table>

Source: Esri; Consumer Expenditure Survey; ICSC; RCLCO
OFFICE MARKET ANALYSIS

OFFICE MARKET TRENDS

Note: 2019 data as of August 3, 2019. Data represents office buildings with over 10,000 square feet. Source: CoStar; RCLCO
SELECTED OFFICE PROJECTS

<table>
<thead>
<tr>
<th>KEY</th>
<th>PROPERTY NAME</th>
<th>ADDRESS</th>
<th>YEAR BUILT</th>
<th>PROPERTY NUMBER OF STORES</th>
<th>SIZE (SF)</th>
<th>AVAILABLE OCCUPANCY</th>
<th>RENT/SF (FS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pearlridge Office Center</td>
<td>98-211 Pali Momi St</td>
<td>1976</td>
<td>B 8</td>
<td>102,833</td>
<td>10,529</td>
<td>89.8% $42.00</td>
</tr>
<tr>
<td>3</td>
<td>ASB Campus</td>
<td>250 N Beretania St</td>
<td>2019</td>
<td>A 11</td>
<td>373,000</td>
<td>0</td>
<td>100.0% N/A</td>
</tr>
<tr>
<td>4</td>
<td>First Hawaiian Center</td>
<td>906 Bishop St</td>
<td>1996</td>
<td>A 30</td>
<td>424,432</td>
<td>50,438</td>
<td>83.1% $21.00 - $30.00 (NDD)</td>
</tr>
<tr>
<td>5</td>
<td>HMSA Center</td>
<td>818 Kawaoku St</td>
<td>2019</td>
<td>A 14</td>
<td>263,119</td>
<td>0</td>
<td>100.0% N/A</td>
</tr>
<tr>
<td>6</td>
<td>Hale Pawa’a</td>
<td>1401 S Beretania St</td>
<td>2010</td>
<td>A 9</td>
<td>133,000</td>
<td>0</td>
<td>100.0% N/A</td>
</tr>
</tbody>
</table>

OFFICE LEASE COMPS

<table>
<thead>
<tr>
<th>KEY</th>
<th>PROPERTY NAME</th>
<th>YEAR BUILT</th>
<th>SF</th>
<th>ANNUAL RENT/SF</th>
<th>LEASE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pearridge Office Center</td>
<td>1976</td>
<td>3,472</td>
<td>$42.00</td>
<td>NNN</td>
</tr>
<tr>
<td>2</td>
<td>Sonido-Alquero Building</td>
<td>1980</td>
<td>2,928</td>
<td>$24.00 - $42.00</td>
<td>NNN</td>
</tr>
<tr>
<td>3</td>
<td>Sonido-Alquero Building</td>
<td>1980</td>
<td>1,054</td>
<td>$24.00 - $42.00</td>
<td>NNN</td>
</tr>
<tr>
<td>4</td>
<td>Kaahumanu Building</td>
<td>1978</td>
<td>1,088</td>
<td>$42.00</td>
<td>NNN</td>
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<tr>
<td>5</td>
<td>Kaahumanu Building</td>
<td>1978</td>
<td>1,565</td>
<td>$19.00</td>
<td>NNN</td>
</tr>
<tr>
<td>6</td>
<td>Harbor Court</td>
<td>1994</td>
<td>1,397</td>
<td>$37.80</td>
<td>FSG</td>
</tr>
<tr>
<td>7</td>
<td>Harbor Court</td>
<td>1994</td>
<td>2,125</td>
<td>$37.80</td>
<td>FSG</td>
</tr>
<tr>
<td>8</td>
<td>Harbor Court</td>
<td>1994</td>
<td>5,335</td>
<td>$37.80</td>
<td>FSG</td>
</tr>
<tr>
<td>9</td>
<td>Harbor Court</td>
<td>1994</td>
<td>8,029</td>
<td>$37.80</td>
<td>FSG</td>
</tr>
<tr>
<td>10</td>
<td>Harbor Court</td>
<td>1994</td>
<td>2,678</td>
<td>$37.80</td>
<td>FSG</td>
</tr>
<tr>
<td>11</td>
<td>1301 Young St</td>
<td>2012</td>
<td>3,500</td>
<td>$35.76</td>
<td>FSG</td>
</tr>
<tr>
<td>12</td>
<td>1301 Young St</td>
<td>2012</td>
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<td>$35.76</td>
<td>FSG</td>
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<tr>
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<td>1301 Young St</td>
<td>2012</td>
<td>5,300</td>
<td>$35.76</td>
<td>FSG</td>
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<tr>
<td>14</td>
<td>Airport Center</td>
<td>1972</td>
<td>7,513</td>
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<tr>
<td>15</td>
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<td>5,847</td>
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<tr>
<td>16</td>
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<td>1972</td>
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<td>$16.80 - $19.20</td>
<td>NNN</td>
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<tr>
<td>17</td>
<td>Airport Center</td>
<td>1972</td>
<td>3,803</td>
<td>$16.80 - $19.20</td>
<td>NNN</td>
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<tr>
<td>18</td>
<td>Airport Center</td>
<td>1972</td>
<td>2,311</td>
<td>$16.80 - $19.20</td>
<td>NNN</td>
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<tr>
<td>19</td>
<td>Hawaii Gateway</td>
<td>1969</td>
<td>10,180</td>
<td>$16.80 - $18.60</td>
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<tr>
<td>20</td>
<td>Hawaii Gateway</td>
<td>1969</td>
<td>10,694</td>
<td>$16.80 - $18.60</td>
<td>NNN</td>
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<tr>
<td>21</td>
<td>Hawaii Gateway</td>
<td>1969</td>
<td>10,915</td>
<td>$16.80 - $18.60</td>
<td>NNN</td>
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<tr>
<td>22</td>
<td>Hawaii Gateway</td>
<td>1969</td>
<td>5,577</td>
<td>$16.80 - $18.60</td>
<td>NNN</td>
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<tr>
<td>23</td>
<td>Hawaii Gateway</td>
<td>1969</td>
<td>5,033</td>
<td>$16.80 - $18.60</td>
<td>NNN</td>
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<tr>
<td>24</td>
<td>Hawaii Gateway</td>
<td>1969</td>
<td>4,234</td>
<td>$16.80 - $18.60</td>
<td>NNN</td>
</tr>
</tbody>
</table>

Total/Avg. 94,124 $26.38 - $28.97

Note: Only includes the 5 largest spaces in each building, where applicable. Excludes office spaces smaller than 1,000 square feet.
OFFICE PIPELINE

MAP

KEY

PROJECT DEVELOPER EST. OPENING OFFICE SF

PLANNED/PROPOSED

Live Work Play Aiea Robertson Properties Group N/A 30,000

ALOHA STADIUM SUPPORTED OFFICE DELIVERIES

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>75,031</td>
<td>83,326</td>
<td>90,577</td>
<td>98,031</td>
<td>105,749</td>
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</tbody>
</table>
HOTEL MARKET ANALYSIS

OAUH VISITATION TRENDS
### Existing Hotel Supply in PMA (Leeeward Honolulu & Central Honolulu)

#### Class Hotels Rooms Avg. Scale % of Rooms

<table>
<thead>
<tr>
<th>Class</th>
<th>Hotels</th>
<th>Rooms</th>
<th>Avg. Scale</th>
<th>% of Rooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luxury Class</td>
<td>4</td>
<td>1,889</td>
<td>422</td>
<td>6.0%</td>
</tr>
<tr>
<td>Upper Upscale Class</td>
<td>19</td>
<td>13,630</td>
<td>717</td>
<td>48.3%</td>
</tr>
<tr>
<td>Upscale Class</td>
<td>13</td>
<td>6,628</td>
<td>229</td>
<td>23.5%</td>
</tr>
<tr>
<td>Upper Midscale Class</td>
<td>29</td>
<td>6,216</td>
<td>154</td>
<td>22.2%</td>
</tr>
<tr>
<td>Midscale Class</td>
<td>4</td>
<td>616</td>
<td>154</td>
<td>2.2%</td>
</tr>
<tr>
<td>Economy Class</td>
<td>14</td>
<td>1,242</td>
<td>89</td>
<td>4.4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>83</strong></td>
<td><strong>28,247</strong></td>
<td><strong>340</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

### Average Daily Rates (ADR)

![Average Daily Rates Graph](image-url)
OCCUPANCY RATES

HOTEL COMPS

MAP KEY
1. Oahu
2. Luxury
3. Upper Upscale
4. Upscale
5. Upper Midscale
6. Midscale & Economy

HOTEL COMPS

<table>
<thead>
<tr>
<th>MAP KEY</th>
<th>CHAIN SCALE</th>
<th>HOTEL</th>
<th>YEAR BUILT</th>
<th>YEARreno</th>
<th># OF KEYS</th>
<th>AVG. RACK RATE</th>
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<tbody>
<tr>
<td>LUXURY CLASS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Four Seasons Resort Oahu @ Ko Olina</td>
<td>2016</td>
<td>N/A</td>
<td>370</td>
<td>$549</td>
<td></td>
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<tr>
<td>2</td>
<td>Premium Collection The Royal Hawaiian</td>
<td>1959</td>
<td>2009</td>
<td>528</td>
<td>$397</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Trump International Hotel Waikiki</td>
<td>2009</td>
<td>N/A</td>
<td>340</td>
<td>$543</td>
<td></td>
</tr>
<tr>
<td>UPPER UPScale CLASS</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Embassy Suites by Hilton Oahu Kapolei</td>
<td>2017</td>
<td>N/A</td>
<td>180</td>
<td>$342</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Hyatt Centric Waikiki Beach</td>
<td>2016</td>
<td>N/A</td>
<td>230</td>
<td>$260</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>The Modern Honolulu</td>
<td>2010</td>
<td>N/A</td>
<td>353</td>
<td>$232</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Autograph Collection The Laylow</td>
<td>1973</td>
<td>2017</td>
<td>251</td>
<td>$307</td>
<td></td>
</tr>
<tr>
<td>UPScale CLASS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Hilton Garden Inn Waikiki Beach</td>
<td>1973</td>
<td>2016</td>
<td>623</td>
<td>$240</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Hyatt Place Waikiki Beach</td>
<td>1970</td>
<td>2011</td>
<td>426</td>
<td>$237</td>
<td></td>
</tr>
<tr>
<td>UPPER MIDScale CLASS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Hampton Inn Oahu Kapolei</td>
<td>2016</td>
<td>N/A</td>
<td>175</td>
<td>$249</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Shoreline Hotel Waikiki</td>
<td>2012</td>
<td>N/A</td>
<td>135</td>
<td>$192</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Holiday Inn Express Waikiki</td>
<td>1984</td>
<td>2017</td>
<td>596</td>
<td>$179</td>
<td></td>
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</table>

Source: STR; TripAdvisor; RCLCO
### HOTEL PIPELINE

**MAP KEY**

<table>
<thead>
<tr>
<th>MAP KEY</th>
<th>HOTEL</th>
<th>CLASS</th>
<th>YEAR OPENED</th>
<th>ROOMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mandarin Oriental Honolulu</td>
<td>Luxury</td>
<td>2022</td>
<td>125</td>
</tr>
<tr>
<td>2</td>
<td>Hawaii Ocean Plaza</td>
<td>Upscale</td>
<td>2022</td>
<td>175</td>
</tr>
<tr>
<td>3</td>
<td>Residence Inn Oahu Kapolei</td>
<td>Upscale</td>
<td>2019</td>
<td>138</td>
</tr>
<tr>
<td>4</td>
<td>Unnamed Hotel (Puck’s Alley/Varsity Building Site)</td>
<td>N/A</td>
<td>N/A</td>
<td>200</td>
</tr>
<tr>
<td>5</td>
<td>Unnamed Hotel at Lippa Place</td>
<td>N/A</td>
<td>N/A</td>
<td>30</td>
</tr>
<tr>
<td>6</td>
<td>Unnamed Hotel near Honolulu Airport</td>
<td>N/A</td>
<td>N/A</td>
<td>200</td>
</tr>
<tr>
<td>7</td>
<td>Wo Fat Building Renovation</td>
<td>N/A</td>
<td>N/A</td>
<td>24</td>
</tr>
<tr>
<td>8</td>
<td>Outrigger Reef Waikiki Beach Resort (2nd Tower)</td>
<td>Luxury</td>
<td>2020+</td>
<td>60</td>
</tr>
<tr>
<td>9</td>
<td>Live Work Play Area</td>
<td>Upper Midscale Condo-Hotel</td>
<td>N/A</td>
<td>150</td>
</tr>
<tr>
<td>10</td>
<td>Hilton Grand Vacations</td>
<td>Condo-Hotel (Premium)</td>
<td>2022</td>
<td>246</td>
</tr>
<tr>
<td>11</td>
<td>1500 Kapilani</td>
<td>Condo-Hotel (Premium)</td>
<td>2024</td>
<td>444</td>
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<tr>
<td>12</td>
<td>Sky Ala Moana</td>
<td>Condo-Hotel (Premium)</td>
<td>N/A</td>
<td>322</td>
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<tr>
<td>13</td>
<td>King Kalakaua Plaza</td>
<td>N/A</td>
<td>2021</td>
<td>237</td>
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</table>

### ALOHA STADIUM CUMULATIVE SUPPORTED HOTEL DELIVERIES (UPPER MIDSCALE AND ABOVE)

<table>
<thead>
<tr>
<th>Year</th>
<th>Rooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>187</td>
</tr>
<tr>
<td>Year 2</td>
<td>183</td>
</tr>
<tr>
<td>Year 3</td>
<td>179</td>
</tr>
<tr>
<td>Year 4</td>
<td>208</td>
</tr>
<tr>
<td>Year 5</td>
<td>237</td>
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</table>

Source: CoStar; Property websites; Local news; RCLCO
## APPENDIX I: RESIDUAL LAND VALUE ANALYSIS

### RESIDUAL LAND VALUE ANALYSIS

<table>
<thead>
<tr>
<th>Unit Use</th>
<th>Studios/FX</th>
<th>Apartments</th>
<th>Condos</th>
<th>Condos</th>
<th>Offices</th>
<th>Hotel</th>
<th>Retail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>High-Rise</td>
<td>Conventional</td>
<td>Premium</td>
<td>High-Rise</td>
<td>Upper</td>
<td>&amp; Higher</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ground Floor Retail GSF</td>
<td>22.5</td>
<td>607.5</td>
<td>168.4</td>
<td>168.4</td>
<td>302</td>
<td>302</td>
<td></td>
</tr>
<tr>
<td>Average Unit Size</td>
<td>811</td>
<td>749</td>
<td>1513</td>
<td>1513</td>
<td>42</td>
<td>42</td>
<td></td>
</tr>
</tbody>
</table>

### PROJECT SCALE

| Acres | 1.40 | 0.80 | 1.00 | 0.80 | 0.35 | 0.35 | 4.00 |
| Ground-Floor Retail GSF | 22.5 | 607.5 | 168.4 | 168.4 | 302 | 302 |
| Ground-Floor GLA | 1.40 | 0.80 | 1.00 | 0.80 | 0.35 | 0.35 | 4.00 |
| Primary Parking Spaces | 95% | 95% | 95% | 95% | 95% | 95% | 95% |
| Total GLA | 300,000 | 240,000 | 180,000 | 155,000 | 114,000 | 114,000 |
| Ground-Floor Parking Spaces | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |

### PRIMARY OPERATIONS

| Potential Revenue (Leased Spaces) | $3.35 | $112,200,000 | $60,000 | $60,000 | $55,000 | $470,000 | $154,578,000 |
| Potential Revenue (Hotel Rooms) | $4.0 | $160,000 | $80,000 | $80,000 | $75,000 | $600,000 | $205,000 |
| Other Income | 3.5% | $7,000 | $7,000 | $7,000 | $6,000 | $200,000 | $68,544,000 |
| Total Revenue | 9.0% | $3,057,000 | $150,000 | $150,000 | $141,000 | $610,000 | $208,564,000 |

### GROUND-FLOOR RETAIL OPERATIONS

| Potential Revenue (Leased Spaces) | $3.35 | $112,200,000 | $60,000 | $60,000 | $55,000 | $470,000 | $154,578,000 |
| Potential Revenue (High-Rise) | $4.0 | $160,000 | $80,000 | $80,000 | $75,000 | $600,000 | $205,000 |
| Other Income | 3.5% | $7,000 | $7,000 | $7,000 | $6,000 | $200,000 | $68,544,000 |
| Total Revenue | 9.0% | $3,057,000 | $150,000 | $150,000 | $141,000 | $610,000 | $208,564,000 |

### MARKET VALUE

| Primary Capitalized Market Value | 4.5% | $170,505,000 | $95,000 | $95,000 | $90,000 | $3,000,000 | $68,544,000 |
| Plus Sales Price (GP) | 4.0% | $170,505,000 | $95,000 | $95,000 | $90,000 | $3,000,000 | $68,544,000 |
| Less: Selling Costs/Commissions | 0.7% | $170,505,000 | $95,000 | $95,000 | $90,000 | $3,000,000 | $68,544,000 |
| Total Market Value | 4.5% | $170,505,000 | $95,000 | $95,000 | $90,000 | $3,000,000 | $68,544,000 |
| Condominium Rental Capitalized MV | 4.5% | $170,505,000 | $95,000 | $95,000 | $90,000 | $3,000,000 | $68,544,000 |

Source: Real Capital Analytics; CoStar; Broker interviews; Marshall & Swift; RLB Advisors; CBRE; RCLCO

Vicitus Advisors LLC | Strategic Market Analysis | Aloha Stadium Redevelopment | 10/23/2019 | 156
## RESIDUAL LAND VALUE ANALYSIS (CONT.)

### APPENDIX II: APARTMENT DEMAND ANALYSIS

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Product Type</th>
<th>High-Rise Apartments</th>
<th>Condo</th>
<th>Office (High-Rise Office)</th>
<th>Hotel (Upper Midscale &amp; Higher)</th>
<th>Retail (Other)</th>
<th>Lifestyle/Entertainment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total Market Value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$212,794,908</td>
<td>$911,858,908</td>
<td>$183,031,000</td>
<td></td>
<td>$73,368,000</td>
<td>$164,575,600</td>
</tr>
</tbody>
</table>

### HARD COSTS

- Site Costs (per Acre) $725,000
- Building Construction (per GSF) $380, $102,458,810
- Parking Construction (per Space) $41,790, $22,216,673
- Primary TI's (per GLA) $20, $1,723,120
- GFR TI's (per GLA) $5, $10,505,287
- FF&E (per Unit) $0
- Hard Cost Contingency 0.0%

### SOFT COSTS

- Arch/Eng/Consultants (% of hard) 5.0%
- Permits/Fees/Taxes (% of hard) 2.0%
- Legal/Bond/Insurance (% of hard) 2.0%
- Marketing (% of value) 0.0%
- Primary Leasing Commissions (rate x term) 5.00%
- Secondary Leasing Commissions (rate x term) 30.0%
- Soft Cost Contingency (% of soft) 5.0%
- Overhead/Developer Fee (% of hard and soft) 5.0%

### FINANCING COSTS

- Max Costs $1,723,120
- Max Construction Loan Amount $191,323,350
- Average Loan Balance $121,505,000
- Interest Rate 5.0%
- Term (Years) 2.0

### DEVELOPER PROFIT

- Profits (% of sales) 15.0%
- Total Developer Profit $32,398,308

### RESIDUAL LAND VALUE ANALYSIS (CONT.)

- Total $15,973,094
- Par Unit $46,507
- Par Land $47
- Per Acre $15,713,212

Source: Real Capital Analytics; CoStar; Broker interviews; Marshall & Swift; RLB Advisors; CBRE; RCLCO

Vicis Advisors LLC | Strategic Market Analysis | Aloha Stadium Redevelopment | 10/23/2019 | 157

Vicis Advisors LLC | Strategic Market Analysis | Aloha Stadium Redevelopment | 10/23/2019 | 158
## ANNUAL MULTIFAMILY RENTER DEMAND
### PRIMARY MARKET AREA

<table>
<thead>
<tr>
<th>INCOME</th>
<th>UNDER 25</th>
<th>25-34</th>
<th>35-54</th>
<th>55-64</th>
<th>65+</th>
<th>TOTAL</th>
</tr>
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<tbody>
<tr>
<td>UNDER $50,000</td>
<td>1,252</td>
<td>2,399</td>
<td>2,475</td>
<td>885</td>
<td>106</td>
<td>7,117</td>
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<tr>
<td>$50,000 - $74,999</td>
<td>411</td>
<td>1,416</td>
<td>1,188</td>
<td>378</td>
<td>249</td>
<td>3,642</td>
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<tr>
<td>$75,000 - $99,999</td>
<td>166</td>
<td>583</td>
<td>940</td>
<td>240</td>
<td>73</td>
<td>2,001</td>
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<tr>
<td>$100,000 - $149,999</td>
<td>251</td>
<td>754</td>
<td>569</td>
<td>169</td>
<td>43</td>
<td>1,786</td>
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<tr>
<td>$150,000 AND OVER</td>
<td>142</td>
<td>518</td>
<td>439</td>
<td>166</td>
<td>25</td>
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<tr>
<td>TOTAL</td>
<td>2,221</td>
<td>5,670</td>
<td>5,611</td>
<td>1,838</td>
<td>496</td>
<td>15,835</td>
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</table>

Source: Esri; American Community Survey PUMS; RCLCO

## ALOHA STADIUM ABSORPTION POTENTIAL & SUPPORTED SUPPLY ADDITIONS

### Aloha Stadium Annual Absorption Potential

<table>
<thead>
<tr>
<th>DEMAND BY UNIT TYPE</th>
<th>STUDIO</th>
<th>1BR</th>
<th>2BR</th>
<th>3BR+</th>
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<td>Income-Qualified Demand Available for Capture</td>
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<tr>
<td>Aloha Stadium Capture of L.H. (%)</td>
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<td>Other Demand (% of Total)</td>
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<td>25.0%</td>
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<td>3.3%</td>
<td>3.3%</td>
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<td>Total Annual Absorption</td>
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<td>56</td>
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<td>Aloha Stadium Supported Supply Additions</td>
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<td>Year 1</td>
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<td>254</td>
<td>336</td>
<td>419</td>
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### By Lifestyle

- Empty Nester: 11%
- Family: 22%
- Mature Professional: 24%
- Post-Grad: 8%
- Young Professional: 26%

### By Unit Type

- Studio: 18.7%
- 1BR: 28.1%
- 2BR: 40.1%
- 3BR+: 13.0%
### ALOHA STADIUM ANN. CONDO SALES POTENTIAL

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<th>Source Market</th>
<th>Leeward Honolulu</th>
<th>Central Honolulu</th>
<th>Total</th>
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<tr>
<td><strong>Annual Average Condo Sales Volume (2014-2018)</strong></td>
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<td>&lt;$500K</td>
<td>713</td>
<td>2,089</td>
<td>2,802</td>
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<td>$500K-$1M</td>
<td>89</td>
<td>1,120</td>
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<td>$1.5M-$2M</td>
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<td>161</td>
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<td>$2M+</td>
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<td>Total Annual</td>
<td>892</td>
<td>3,540</td>
<td>4,432</td>
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<th>ALOHA STADIUM Capture Rate</th>
<th>Low</th>
<th>Base</th>
<th>High</th>
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<td>&lt;$500K</td>
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<td>$500K-$1M</td>
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<td>20.0%</td>
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<tr>
<td>$2M+</td>
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<table>
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<td>Low</td>
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<td>46</td>
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<tr>
<td>$1.5M-$2M</td>
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<td>0</td>
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<tr>
<td>$2M+</td>
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<tr>
<td>Total Annual</td>
<td>45</td>
<td>55</td>
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<table>
<thead>
<tr>
<th>External Demand</th>
<th>Low</th>
<th>Base</th>
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<td>&lt;$500K</td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
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<tr>
<td>$500K-$1M</td>
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<tr>
<td>$1M-$1.5M</td>
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<tr>
<td>$1.5M-$2M</td>
<td>0%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>$2M+</td>
<td>0%</td>
<td>25%</td>
<td>25%</td>
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<table>
<thead>
<tr>
<th>Total ALOHA STADIUM Annual Sales Potential</th>
<th>Low</th>
<th>Base</th>
<th>High</th>
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<tbody>
<tr>
<td>&lt;$500K</td>
<td>48</td>
<td>62</td>
<td>95</td>
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<td>$500K-$1M</td>
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<td>$1.5M-$2M</td>
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<tr>
<td>$2M+</td>
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<tr>
<td>Total Annual</td>
<td>53</td>
<td>74</td>
<td>119</td>
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<table>
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<td>&lt;$500K</td>
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Source: RealQuest; RCLCO
## APPENDIX IV: RETAIL DEMAND ANALYSIS

### RETAIL DEMAND ANALYSIS

![Retail Demand Analysis Chart](image)

<table>
<thead>
<tr>
<th>Type of Retail</th>
<th>Households - Leeward Honolulu</th>
<th>Households - Central Honolulu</th>
<th>Households - Subject Site</th>
<th>Employees - Leeward Honolulu</th>
<th>Employees - Subject Site</th>
<th>Visitors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery &amp; Drug</td>
<td>13,000 SF</td>
<td>3,500 SF</td>
<td>5,000 SF</td>
<td>8,000 SF</td>
<td>500 SF</td>
<td>7,500 SF</td>
<td>37,500 SF</td>
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<tr>
<td>Restaurants</td>
<td>8,500 SF</td>
<td>2,000 SF</td>
<td>3,500 SF</td>
<td>4,000 SF</td>
<td>500 SF</td>
<td>57,000 SF</td>
<td>75,500 SF</td>
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<tr>
<td>Hard Goods</td>
<td>2,500 SF</td>
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<td>0 SF</td>
<td>0 SF</td>
<td>4,500 SF</td>
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<td>Soft Goods</td>
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<td>1,500 SF</td>
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<td>Entertainment &amp; Services</td>
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<td>500 SF</td>
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<td><strong>17,500 SF</strong></td>
<td><strong>18,000 SF</strong></td>
<td><strong>1,500 SF</strong></td>
<td><strong>158,000 SF</strong></td>
<td><strong>250,000 SF</strong></td>
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Source: Esri; Consumer Expenditure Survey; ICSC; RCLCO
# APPENDIX V: OFFICE DEMAND ANALYSIS

## OFFICE DEMAND ANALYSIS

### OAHU; 2007-2028

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<td>EMPLOYMENT BY SECTOR (000s)</td>
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</tr>
</tbody>
</table>

## EMPLOYMENT-DRIVEN OFFICE DEMAND

### Office/ Flex Using Employment (000s)\(^1\)

- 140
- 140
- 139
- 139
- 134
- 137
- 140
- 143
- 145
- 147
- 148
- 149
- 151
- 151
- 151
- 151
- 151
- 151
- 151
- 151
- 151
- 151

### Growth

- 2.8
- 3.4
- 3.2
- 3.2
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0

### Employment Density \(^2\)

- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase
- Increase

### Employment Density \(^3\)

- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125
- 125

### Office/Flex Space Demand (000s SF)

- 25,850
- 25,978
- 26,321
- 25,671
- 26,740
- 26,301
- 27,084
- 26,965
- 27,072
- 26,901
- 26,976
- 26,876
- 26,732
- 26,976
- 26,876
- 26,732
- 26,976
- 26,876
- 26,732
- 26,976
- 26,876
- 26,732

### Net Absorption (000s SF)

- 25,850
- 25,978
- 26,321
- 25,671
- 26,740
- 26,301
- 27,084
- 26,965
- 27,072
- 26,901
- 26,976
- 26,876
- 26,732
- 26,976
- 26,876
- 26,732
- 26,976
- 26,876
- 26,732
- 26,976
- 26,876
- 26,732

### ECONOMIC TRENDS

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<th>Economic Activity</th>
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<tr>
<td>2. Applies the assumptions of percent of office employment by industry to the total employment in each industry.</td>
</tr>
<tr>
<td>3. Historical employment density is the ratio of occupied square feet to the total office/ flex employment. Office Space is becoming more efficient, and square per employee has declined through 2018.</td>
</tr>
<tr>
<td>4. The analysis assumes that employment density will gradually decline to 177 square feet per worker by 2028, with new jobs added at a density of 125 square feet per employee.</td>
</tr>
<tr>
<td>5. Per Costar Group. Inventory includes all office space greater than 10,000 square feet in the respective geography.</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics; Moody's Economy.com; DBEDT; CoStar; RCLCO

Victus Advisors LLC | Strategic Market Analysis | Aloha Stadium Redevelopment | 10/23/2019 | 166
### FORECASTED OFFICE ABSORPTION & OCCUPANCY

**OAHU & LEEWARD HONOLULU; 2018-2028**

<table>
<thead>
<tr>
<th>OAHU PROJECTED NET ABSORPTION</th>
<th>ASSUMPTION</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>-305</td>
<td>61</td>
<td>146</td>
<td>-28</td>
<td>130</td>
<td>110</td>
<td>96</td>
<td>99</td>
<td>103</td>
<td></td>
</tr>
</tbody>
</table>

**STABILIZED OCCUPANCY** 90%

<table>
<thead>
<tr>
<th>OAHU</th>
<th></th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capture Rate</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupied Space</td>
<td>26,671</td>
<td>26,732</td>
<td>26,878</td>
<td>26,938</td>
<td>26,955</td>
<td>27,085</td>
<td>27,195</td>
<td>27,292</td>
<td>27,391</td>
<td>27,493</td>
<td></td>
</tr>
<tr>
<td>Supported Supply Additions</td>
<td>1,203</td>
<td>162</td>
<td>117</td>
<td>0</td>
<td>113</td>
<td>122</td>
<td>107</td>
<td>110</td>
<td>114</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventory (RBA)</td>
<td>28,499</td>
<td>29,702</td>
<td>29,864</td>
<td>29,981</td>
<td>29,981</td>
<td>30,095</td>
<td>30,217</td>
<td>30,324</td>
<td>30,434</td>
<td>30,548</td>
<td></td>
</tr>
<tr>
<td>Occupancy Rate</td>
<td>93.8%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>89.9%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>90.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LEEWARD HONOLULU</th>
<th></th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capture Rate</td>
<td>20.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Absorption</td>
<td></td>
<td>12</td>
<td>29</td>
<td>21</td>
<td>(6)</td>
<td>26</td>
<td>22</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Occupied Space</td>
<td>1,490</td>
<td>1,502</td>
<td>1,532</td>
<td>1,553</td>
<td>1,547</td>
<td>1,573</td>
<td>1,595</td>
<td>1,614</td>
<td>1,634</td>
<td>1,655</td>
<td></td>
</tr>
<tr>
<td>Supported Supply Additions</td>
<td>59</td>
<td>32</td>
<td>23</td>
<td>0</td>
<td>23</td>
<td>24</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventory (RBA)</td>
<td>1,611</td>
<td>1,669</td>
<td>1,702</td>
<td>1,725</td>
<td>1,725</td>
<td>1,748</td>
<td>1,772</td>
<td>1,784</td>
<td>1,816</td>
<td>1,839</td>
<td></td>
</tr>
<tr>
<td>Occupancy Rate</td>
<td>92.5%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>89.7%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>90.0%</td>
</tr>
</tbody>
</table>

1 See prior page.
2 Assumes that a stabilized office market operates at 90% occupancy. This is threshold for the market to support supply additions.
3 Based on historical capture of net absorption, as well as RCLCO assessment of growth in Leeward Honolulu's attractiveness as an office market.
4 Does not include additions currently under construction or in the pipeline.

Source: Bureau of Labor Statistics; Moody's Economy.com; DBEDT; CoStar; RCLCO

---

### CUMULATIVE SUPPORTED SUPPLY ADDITIONS

**ALOHA STADIUM; 2023-2027**

<table>
<thead>
<tr>
<th>Years</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leeward Honolulu Supported Leased Office Supply Additions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demand Growth 1</td>
<td>59</td>
<td>32</td>
<td>23</td>
<td>0</td>
<td>23</td>
<td>24</td>
<td>21</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>Demand from Turnover 2</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
</tr>
<tr>
<td>Total Demand</td>
<td>135</td>
<td>109</td>
<td>100</td>
<td>76</td>
<td>99</td>
<td>101</td>
<td>98</td>
<td>98</td>
<td>99</td>
</tr>
</tbody>
</table>

| Aloha Stadium Capture | | | | | | | | | |
|-----------------------| | | | | | | | | |
| Aloha Stadium Annual Demand | 20.0% | | | | | | | | |
| Aloha Stadium Cumulative Demand | 0 | 0 | 0 | 0 | 20 | 20 | 20 | 20 | 20 |

1 See prior page.
2 Estimates turnover in existing space assuming lease terms of seven years, 10% of those with expiring leases choose to change office space, and 20% Leeward Honolulu capture of turnover.

Source: Bureau of Labor Statistics; Moody’s Economy.com; DBEDT; CoStar; RCLCO
**APPENDIX VI: HOTEL DEMAND ANALYSIS**

**LEEWARD HONOLULU & CENTRAL HONOLULU**

**TOTAL ROOMS SUPPLY (UPPER MIDScale & HIGHER)**

2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030
26,389

**ADDITIONS/DELETIONS TO SUPPLY**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Additions</th>
<th>Deletions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>183</td>
<td>0</td>
</tr>
<tr>
<td>2019</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2020</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2021</td>
<td>300</td>
<td>0</td>
</tr>
<tr>
<td>2022</td>
<td>149</td>
<td>0</td>
</tr>
<tr>
<td>2023</td>
<td>149</td>
<td>0</td>
</tr>
<tr>
<td>2024</td>
<td>149</td>
<td>0</td>
</tr>
<tr>
<td>2025</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2026</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2027</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Cumulative Rooms Supply**

2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030
26,389 26,572 26,572 26,572 26,572 27,021 27,319 27,319 27,319 27,319 0 0 0

**Total Annual Rooms Supply (Nights)**

2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030
9,631,985 9,698,780 9,698,780 9,698,780 9,862,989 9,971,435 9,971,435

**DEMONSTRATED DEMAND**

<table>
<thead>
<tr>
<th>Year</th>
<th>Demonstrated Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>8,144,037</td>
</tr>
<tr>
<td>2019</td>
<td>8,295,318</td>
</tr>
<tr>
<td>2020</td>
<td>8,448,604</td>
</tr>
<tr>
<td>2021</td>
<td>8,484,819</td>
</tr>
<tr>
<td>2022</td>
<td>8,524,509</td>
</tr>
<tr>
<td>2023</td>
<td>8,564,270</td>
</tr>
<tr>
<td>2024</td>
<td>8,604,179</td>
</tr>
<tr>
<td>2025</td>
<td>8,644,261</td>
</tr>
<tr>
<td>2026</td>
<td>8,687,668</td>
</tr>
<tr>
<td>2027</td>
<td>8,731,315</td>
</tr>
</tbody>
</table>

**TOTAL DEMAND**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>8,144,037</td>
</tr>
<tr>
<td>2019</td>
<td>8,295,318</td>
</tr>
<tr>
<td>2020</td>
<td>8,448,604</td>
</tr>
<tr>
<td>2021</td>
<td>8,484,819</td>
</tr>
<tr>
<td>2022</td>
<td>8,524,509</td>
</tr>
<tr>
<td>2023</td>
<td>8,564,270</td>
</tr>
<tr>
<td>2024</td>
<td>8,604,179</td>
</tr>
<tr>
<td>2025</td>
<td>8,644,261</td>
</tr>
<tr>
<td>2026</td>
<td>8,687,668</td>
</tr>
<tr>
<td>2027</td>
<td>8,731,315</td>
</tr>
</tbody>
</table>

**SUPPLY / DEMAND**

<table>
<thead>
<tr>
<th>Year</th>
<th>Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>84.6%</td>
</tr>
<tr>
<td>2019</td>
<td>85.5%</td>
</tr>
<tr>
<td>2020</td>
<td>87.1%</td>
</tr>
<tr>
<td>2021</td>
<td>87.5%</td>
</tr>
<tr>
<td>2022</td>
<td>86.9%</td>
</tr>
<tr>
<td>2023</td>
<td>86.8%</td>
</tr>
<tr>
<td>2024</td>
<td>86.8%</td>
</tr>
<tr>
<td>2025</td>
<td>86.7%</td>
</tr>
<tr>
<td>2026</td>
<td>87.6%</td>
</tr>
</tbody>
</table>

**Total Cumulative Pent-up Demand**

<table>
<thead>
<tr>
<th>Year</th>
<th>At 80% Stabilized Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>1,582</td>
</tr>
<tr>
<td>2019</td>
<td>1,837</td>
</tr>
<tr>
<td>2020</td>
<td>2,362</td>
</tr>
<tr>
<td>2021</td>
<td>2,498</td>
</tr>
<tr>
<td>2022</td>
<td>2,309</td>
</tr>
<tr>
<td>2023</td>
<td>2,296</td>
</tr>
<tr>
<td>2024</td>
<td>2,285</td>
</tr>
<tr>
<td>2025</td>
<td>2,433</td>
</tr>
<tr>
<td>2026</td>
<td>2,383</td>
</tr>
</tbody>
</table>

**Subject Site Capture of Upper Midscale and Higher Demand**

<table>
<thead>
<tr>
<th>Year</th>
<th>Capture</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>20%</td>
</tr>
<tr>
<td>2019</td>
<td>20%</td>
</tr>
<tr>
<td>2020</td>
<td>20%</td>
</tr>
<tr>
<td>2021</td>
<td>20%</td>
</tr>
<tr>
<td>2022</td>
<td>20%</td>
</tr>
</tbody>
</table>

Source: Smith Travel Research (STR); Hawaii Department of Business; DBEDT; Hawaii Tourism Authority
CRITICAL ASSUMPTIONS

Our conclusions are based on our analysis of the information available from our own sources and from the client as of the date of this report. We assume that the information is correct, complete, and reliable.

We made certain assumptions about the future performance of the global, national, and local economy and real estate market, and on other factors similarly outside either our control or that of the client. We analyzed trends and the information available to us in drawing these conclusions. However, given the fluid and dynamic nature of the economy and real estate markets, as well as the uncertainty surrounding particularly the near-term future, it is critical to monitor the economy and markets continuously and to revisit the aforementioned conclusions periodically to ensure that they are reflective of changing market conditions.

We assume that the economy and real estate markets will grow at a stable and moderate rate to 2020 and beyond. However, stable and moderate growth patterns are historically not sustainable over extended periods of time, the economy is cyclical, and real estate markets are typically highly sensitive to business cycles. Further, it is very difficult to predict when an economic and real estate upturn will end.

With the above in mind, we assume that the long-term average absorption rates and price changes will be as projected, realizing that most of the time performance will be either above or below said average rates.

Our analysis does not consider the potential impact of future economic shocks on the national and/or local economy, and does not consider the potential benefits from major “booms” that may occur. Similarly, the analysis does not reflect the residual impact on the real estate market and the competitive environment of such a shock or boom. Also, it is important to note that it is difficult to predict changing consumer and market psychology.

As such, we recommend the close monitoring of the economy and the marketplace, and updating this analysis as appropriate.

Further, the project and investment economics should be “stress tested” to ensure that potential fluctuations in revenue and cost assumptions resulting from alternative scenarios regarding the economy and real estate market conditions will not cause failure.

In addition, we assume that the following will occur in accordance with current expectations:

- Economic, employment, and household growth
- Other forecasts of trends and demographic and economic patterns, including consumer confidence levels
- The cost of development and construction
- Tax laws (i.e., property and income tax rates, deductibility of mortgage interest, and so forth)
- Availability and cost of capital and mortgage financing for real estate developers, owners and buyers
- Competitive projects will be developed as planned (active and future) and that a reasonable stream of supply offerings will satisfy real estate demand
- Major public works projects occur and are completed as planned

Should any of the above change, this analysis should be updated, with the conclusions reviewed accordingly (and possibly revised).
GENERAL LIMITING CONDITIONS

Reasonable efforts have been made to ensure that the data contained in this study reflect accurate and timely information and are believed to be reliable. This study is based on estimates, assumptions, and other information developed by RCLCO from its independent research effort, general knowledge of the industry, and consultations with the client and its representatives. No responsibility is assumed for inaccuracies in reporting by the client, its agent, and representatives or in any other data source used in preparing or presenting this study. This report is based on information that to our knowledge was current as of the date of this report, and RCLCO has not undertaken any update of its research effort since such date.

Our report may contain prospective financial information, estimates, or opinions that represent our view of reasonable expectations at a particular time, but such information, estimates, or opinions are not offered as predictions or assurances that a particular level of income or profit will be achieved, that particular events will occur, or that a particular price will be offered or accepted. Actual results achieved during the period covered by our prospective financial analysis may vary from those described in our report, and the variations may be material. Therefore, no warranty or representation is made by RCLCO that any of the projected values or results contained in this study will be achieved.

Possession of this study does not carry with it the right of publication thereof or to use the name of “Robert Charles Lesser & Co.” or “RCLCO” in any manner without first obtaining the prior written consent of RCLCO. No abstracting, excerpting, or summarization of this study may be made without first obtaining the prior written consent of RCLCO. This report is not to be used in conjunction with any public or private offering of securities or other similar purpose where it may be relied upon to any degree by any person other than the client without first obtaining the prior written consent of RCLCO. This study may not be used for any purpose other than that for which it is prepared or for which prior written consent has first been obtained from RCLCO.
ECONOMIC & FISCAL IMPACT ANALYSIS
FOR A NEW ALOHA STADIUM &
ANCILLARY DEVELOPMENT
OCTOBER 23, 2019

ASSUMPTIONS

Please note the following key sources for the data utilized in developing this economic and fiscal impact analysis:

• CONSTRUCTION IMPACTS - The building programs and construction cost estimates used in this analysis were developed by Crawford Architects (stadium) and RCLCO (mixed-use development), as shown below. It is assumed that full build-out of more than 3.8 million gross square feet could occur within approximately 15 years of the opening of a new Aloha Stadium.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stadium</td>
<td>635,000</td>
<td>$350,000,000</td>
<td>635,000</td>
<td>$350,000,000</td>
</tr>
<tr>
<td>Retail</td>
<td>263,000</td>
<td>$119,252,280</td>
<td>680,500</td>
<td>$308,559,607</td>
</tr>
<tr>
<td>Residential</td>
<td>730,000</td>
<td>$396,777,492</td>
<td>1,889,500</td>
<td>$1,027,001,467</td>
</tr>
<tr>
<td>Office</td>
<td>83,500</td>
<td>$55,249,352</td>
<td>216,000</td>
<td>$142,920,479</td>
</tr>
<tr>
<td>Hotel</td>
<td>160,000</td>
<td>$86,787,857</td>
<td>414,000</td>
<td>$224,563,580</td>
</tr>
<tr>
<td>Total</td>
<td>1,871,500</td>
<td>$1,008,066,981</td>
<td>3,835,000</td>
<td>$2,053,045,133</td>
</tr>
</tbody>
</table>

Sources: RCLCO, Crawford Architects
Note: (1) Presented in 2019 dollars (2) Full Build-Out figures include Phase 1 (2) Construction costs include hard costs and soft costs, but do not include financing costs or developer fees

• OPERATIONAL IMPACTS - Operational estimates (usage, visitation, revenues, expenses) for the new stadium and ancillary development were developed by Victus Advisors.
In order to estimate the potential economic and fiscal impacts of a new Aloha Stadium and ancillary development, Victus Advisors utilized the following four (4) step process:

1. Estimate the Gross Direct Spending Associated with Annual Stadium & Ancillary Development Operations

2. Identify the Relevant Economic Area for Net Impact Analysis

3. Estimate the Net Direct Spending Occurring within the Defined Economic Area by Outside Visitors

4. Utilize the Multiplier Effect to Estimate Total Economic & Fiscal Impacts (including Direct, Indirect & Induced Spending)

---

1. ESTIMATE GROSS SPENDING

The first step in projecting the potential economic and fiscal impacts of a new Aloha Stadium and ancillary development is estimating the Gross Direct Spending activity that could occur due to both the one-time construction and on-going operations of the new stadium and development.

Gross Direct Spending represents all of the direct spending that could be associated with the project, regardless of income source or spending location.

---

| Primary Sources of Direct Spending from Stadium & Ancillary Development |
|---|---|---|
| **One-Time Construction Expenditures** | **On-Going Facility Operations** |
| Supplies & Materials | Stadium Revenues, such as: |
| Labor Costs | Ticket Sales & VIP Seating |
| Professional Service Fees | Concessions/Catering |
|                     | Sponsorships/Advertising |
|                     | **Ancillary Spending, such as:** |
|                     | Housing Rent & Hotel Rates |
|                     | Disposable Spending |
|                     | Visitor Spending, such as: |
|                     | Lodging |
|                     | Restaurants/Bars |
|                     | Entertainment |
|                     | Retail |
|                     | Transportation |
2. IDENTIFY “LOCAL” ECONOMY

For purposes of this study, Victus Advisors has been tasked with identifying the potential economic and fiscal impacts occurring on Oahu. Therefore, the local economy studied in this analysis is the physical area solely within Oahu/Honolulu County (as highlighted at left).

As described on the next page, “Net” Direct Spending only occurs when the spending source originates outside of the island and occurs within the island’s limits.

![Map of Oahu](image)

Source: East

3. CALCULATE NET IMPACTS

After estimating the “Gross” economic activity associated with the stadium and development, Victus Advisors estimated the portion of Gross Direct Spending that could represent incremental (or “Net”) spending within the island’s economy. Net Direct Spending accounts for the phenomenon of “displacement”, as described below.

**DISPLACEMENT** is the economic principle that assumes a household (or business) sports and entertainment budget would be spent within the local economy with or without development of a new Aloha Stadium. For purposes of this study, we have assumed that local event spending would be displaced (i.e. spent elsewhere within the Oahu economy) without the presence of a new stadium. Therefore...

**NET IMPACTS** estimated by Victus Advisors will only include the estimated dollars spent within Oahu limits by visitors, new residents, or new businesses who come to the island because of the presence of a new Aloha Stadium and ancillary development, thus injecting new incremental dollars into the island’s economy.
4. THE MULTIPLIER EFFECT

Direct Spending that is captured in Oahu is subsequently re-spent, both inside and outside the local economy. The cumulative impact of the re-spending cycles that occur within island limits is called the "Multiplier Effect".

<table>
<thead>
<tr>
<th>Initial Direct Spending</th>
<th>Construction</th>
<th>Facility Revenues &amp; Visitor Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Labor, Materials, Services, etc.</td>
<td>Tickets, Concessions, Sponsorships, Lodging, Restaurants, Entertainment, Retail, etc.</td>
</tr>
</tbody>
</table>

Indirect Spending

| Manufacturing, Wholesalers (Food & Beverage, Merchandise), Shipping/Freight, Utilities, etc. |

Induced Spending

| Additional spending by businesses, households, government entities, and other economic sectors. |

4. THE MULTIPLIER EFFECT (CONT.)

Victus Advisors utilized IMPLAN Multipliers specific to Oahu/Honolulu County (as shown below) to estimate the following Net Economic Impacts:

- **TOTAL OUTPUT** (direct, indirect & induced spending in Oahu)
- **EMPLOYMENT** (full-time & part-time jobs in Oahu)
- **LABOR INCOME** (salaries & personal earnings associated with Oahu jobs)
- **TAX REVENUES** (state & local taxes associated with the total output)

### IMPLAN MULTIPLIERS FOR HONOLULU COUNTY

<table>
<thead>
<tr>
<th>Industry</th>
<th>Total Output Multiplier</th>
<th>Personal Earnings Multiplier</th>
<th>Employment Multiplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction - Non Residential</td>
<td>1.46782</td>
<td>0.56822</td>
<td>8.56895</td>
</tr>
<tr>
<td>Construction - Residential</td>
<td>1.48543</td>
<td>0.36722</td>
<td>5.99861</td>
</tr>
<tr>
<td>Transit &amp; Ground Transportation</td>
<td>1.66845</td>
<td>0.83919</td>
<td>20.02110</td>
</tr>
<tr>
<td>Retail Stores</td>
<td>1.50717</td>
<td>0.54962</td>
<td>14.78580</td>
</tr>
<tr>
<td>Spectator Sports</td>
<td>1.58158</td>
<td>0.45493</td>
<td>29.96025</td>
</tr>
<tr>
<td>Amusement &amp; Recreation (Entertainment)</td>
<td>1.54752</td>
<td>0.54883</td>
<td>17.98860</td>
</tr>
<tr>
<td>Hotels &amp; Motels</td>
<td>1.47394</td>
<td>0.3267</td>
<td>9.84512</td>
</tr>
<tr>
<td>Food Services &amp; Drinking Places</td>
<td>1.46083</td>
<td>0.61934</td>
<td>18.83256</td>
</tr>
<tr>
<td>Other Personal Services</td>
<td>1.57208</td>
<td>0.75043</td>
<td>13.85916</td>
</tr>
</tbody>
</table>
ONE-TIME ECONOMIC IMPACTS OF CONSTRUCTION

As shown below, it is estimated that construction of a new Aloha Stadium and ancillary development at full build-out could generate one-time impacts of over $1.48 billion in economic output, approximately 12,660 construction jobs, and more than $595 million in construction wages.

<table>
<thead>
<tr>
<th>Total Estimated Construction Cost - New Aloha Stadium:*</th>
<th>$350,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Estimated Construction Cost - Phase 1 Ancillary Development*</td>
<td>$658,067,000</td>
</tr>
<tr>
<td>Total Estimated Construction Cost - Additional Phases to Full Build-Out*</td>
<td>$1,044,978,000</td>
</tr>
<tr>
<td><strong>Total Construction Spending - New Stadium &amp; Ancillary Development:</strong></td>
<td><strong>$2,053,045,000</strong></td>
</tr>
</tbody>
</table>

**Estimated Portion of Construction Spending Occurring in Local Economy:** $1,058,526,000

*Construction Estimate Sources: Crawford Architects, RCLCO
Note: (1) Presented in 2019 dollars (2) Construction costs include hard costs and soft costs, but do not include financing costs or developer fees

Estimated Economic Impacts of Construction Spending

<table>
<thead>
<tr>
<th><strong>Total Economic Output:</strong></th>
<th>$1,483,722,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full- and Part-Time Jobs:</td>
<td>12,660</td>
</tr>
<tr>
<td>Personal Earnings:</td>
<td>$595,822,000</td>
</tr>
</tbody>
</table>

ONE-TIME ECONOMIC IMPACTS OF CONSTRUCTION (CONT.)

As shown below, it is estimated that construction of a new Aloha Stadium and ancillary development at full build-out could generate over $16.7 million in state and local general excise tax revenues, via direct ancillary development construction spending and indirect/induced spending associated with stadium construction*.

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Full Build-Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Excise Tax - State</td>
<td>$6,117,000</td>
</tr>
<tr>
<td>General Excise Tax - Oahu</td>
<td>$765,000</td>
</tr>
<tr>
<td><strong>Total - GET Revenue:</strong></td>
<td><strong>$6,882,000</strong></td>
</tr>
</tbody>
</table>

Note: (1) Presented in 2019 dollars (2) Full Build-Out figures include Phase 1 (3) Consists of tax revenues from Phase I and additional phases ancillary development construction spending and stadium-related indirect/induced spending, as construction spending associated with the Stadium was assumed to be non-taxable.

*It is assumed that Aloha Stadium direct construction spending would be non-taxable since the $350 million construction cost is publicly funded.
ANNUAL ECONOMIC IMPACTS OF OPERATIONS

It is estimated that stadium operations (assumed to be completed in Phase 1) could annually generate over $40 million in net total output, 500 net annual jobs, and $14.6 million in net annual wages each year.

ESTIMATED ANNUAL NET ECONOMIC IMPACTS OF STADIUM OPERATIONS

<table>
<thead>
<tr>
<th></th>
<th>Phase 1 Net New</th>
<th>Full Build Net New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Spending</td>
<td>$26,526,000</td>
<td>$26,526,000</td>
</tr>
<tr>
<td>Total Output</td>
<td>$40,424,000</td>
<td>$40,424,000</td>
</tr>
<tr>
<td>Full- &amp; Part-time Jobs</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Personal Earnings</td>
<td>$14,581,000</td>
<td>$14,581,000</td>
</tr>
</tbody>
</table>

Note: (1) Presented in 2019 dollars (2) Full Build-Out figures include Phase 1 (3) Includes both in-stadium/out-of-stadium spending by attendees.

It is estimated that ancillary development operations (retail, residential, office, hotel) at full build-out could annually generate more than $79 million in net total output, 690 net annual jobs, and $28.8 million in net annual wages.

ESTIMATED ANNUAL NET ECONOMIC IMPACTS OF ANCILLARY DEVELOPMENT OPERATIONS

<table>
<thead>
<tr>
<th></th>
<th>Phase 1 Net New</th>
<th>Full Build Net New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Spending</td>
<td>$20,454,000</td>
<td>$52,931,000</td>
</tr>
<tr>
<td>Total Output</td>
<td>$30,599,000</td>
<td>$79,182,000</td>
</tr>
<tr>
<td>Full- &amp; Part-time Jobs</td>
<td>270</td>
<td>690</td>
</tr>
<tr>
<td>Personal Earnings</td>
<td>$11,125,000</td>
<td>$28,789,000</td>
</tr>
</tbody>
</table>

Notes: (1) Presented in 2019 dollars (2) Full Build-Out figures include Phase 1

ANNUAL FISCAL IMPACTS OF OPERATIONS

It is estimated that stadium operations (assumed to be completed in Phase 1) could annually generate more than $1.1 million in net new tax revenues.

ESTIMATED ANNUAL NET FISCAL IMPACTS OF STADIUM OPERATIONS

<table>
<thead>
<tr>
<th></th>
<th>Phase 1 Net New</th>
<th>Full-Build Net New</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Excise Tax - State</td>
<td>$142,000</td>
<td>$142,000</td>
</tr>
<tr>
<td>General Excise Tax - County</td>
<td>$18,000</td>
<td>$18,000</td>
</tr>
<tr>
<td>Transient Accommodations Tax</td>
<td>$969,000</td>
<td>$969,000</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>$1,129,000</td>
<td>$1,129,000</td>
</tr>
</tbody>
</table>

Note: (1) Presented in 2019 dollars (2) Full Build-Out figures include Phase 1 (3) Includes both in-stadium/out-of-stadium spending by attendees.

It is estimated that ancillary development operations (retail, residential, office, hotel) at full build-out could annually generate over $27 million in net new tax revenues.

ESTIMATED ANNUAL NET FISCAL IMPACTS OF ANCILLARY DEVELOPMENT OPERATIONS

<table>
<thead>
<tr>
<th></th>
<th>Phase 1 Net New</th>
<th>Full Build Net New</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Excise Tax - State</td>
<td>$878,000</td>
<td>$2,273,000</td>
</tr>
<tr>
<td>General Excise Tax - County</td>
<td>$110,000</td>
<td>$284,000</td>
</tr>
<tr>
<td>Transient Accommodations Tax</td>
<td>$471,000</td>
<td>$1,220,000</td>
</tr>
<tr>
<td>Property Tax</td>
<td>$9,032,000</td>
<td>$23,377,000</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>$10,491,000</td>
<td>$27,154,000</td>
</tr>
</tbody>
</table>

Notes: (1) Presented in 2019 dollars (2) Full Build-Out figures include Phase 1
As shown below, it is estimated that a new Aloha Stadium and ancillary development (that achieves full build-out within 15 years) could generate net impacts over a period of 25 years with an NPV of over $1.8 billion in total economic output, over $700 million in personal earnings, and over $198 million in state and local tax revenues. In addition, it is estimated that up to 1,190 net new annual jobs could be supported after full build-out.

<table>
<thead>
<tr>
<th>Cumulative (25 Years)</th>
<th>Net Present Value (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Spending:</td>
<td>$2,826,060,000</td>
</tr>
<tr>
<td>Total Output:</td>
<td>$4,118,215,000</td>
</tr>
<tr>
<td>Annual Jobs:</td>
<td>1,190</td>
</tr>
<tr>
<td>Personal Earnings:</td>
<td>$1,544,979,000</td>
</tr>
<tr>
<td>Taxes: (2)</td>
<td>$570,643,000</td>
</tr>
</tbody>
</table>

Notes: (1) Assumes 8.0% discount rate. (2) Includes State and Oahu taxes, including general excise, tourist, and property tax. (3) It is assumed that full build-out is achieved by Year 15.
Appendix J:
Preliminary Engineering Report
4.1.2 Project Requirements

Drainage runoff rates and improvements for the proposed improvements are determined herein based on the CCH DPP, Storm Drainage Standards, dated August 2017. Any increase in runoff due to the proposed improvements will need to be retained on-site to ensure that the project will not have any adverse effects on downstream properties.

In addition, it is anticipated that drainage improvements will also be required to comply with the City’s Rules Relating to Water Quality amended September 2018. Under these rules, projects that disturb more than one (1) acre of land are classified as Priority A projects.

Priority A projects are required (unless determined to be infeasible) to:

- Incorporate appropriate Low Impact Development (LID) site design strategies to the “maximum extent practicable” (MEP).
- Incorporate appropriate Source Control BMPs to the MEP.
- Retain on-site by infiltration, evapotranspiration, or harvest/reuse as much of the water quality volume (WQV) as feasible with appropriate LID Retention Post-Construction Treatment Control BMPs.
- Biofilter any portion of the WQV that is not retained on-site with appropriate LID Biofiltration Post-Construction Treatment Control BMPs.

If it is determined to be infeasible to retain and/or biofilter the Water Quality Volume, the City rules require the project to:

- Treat (by detention, filtration, settling, or vortex separation) and discharge with appropriate Alternative Compliance Post-Construction Treatment Control BMPs, any portion of the WQV that is not retained on-site or biofiltered.
- Retain or biofilter at an offsite location, the volume of runoff from a non-tributary drainage area equivalent to the difference between the project’s WQV and the amount retained on-site or biofiltered.

Appropriate BMP measures include, but are not limited to: infiltration basins and trenches, subsurface infiltration systems, dry wells, bioretention basins, permeable pavement, green roofs, vegetated bio-filters, enhanced swales, detention basins, sand filters, vegetated swales and buffer strips.
4.1.3 Proposed Improvements

The existing site is currently fully developed and is comprised of mostly impervious surfaces. Consequently, it is expected that any increase in the proposed project’s storm water runoff peak discharge rate will be minimal in comparison to those exhibited under existing conditions. Any increase in discharge to the City system due to the proposed project will need to be retained, harvested/reused, or disposed of by percolation on site. Proposed on-site storm drainage improvements will consist of a system of drain inlets, drain manholes, and underground piping. Existing drain lines running beneath proposed building footprints will need to be relocated to ensure access for maintenance (See Figure 4-5).

The final line sizes and drainage structure locations will be determined during the design phase of the project and maintain the existing discharge points to Halawa Stream and the City drainage system. As required by the Storm Drainage Standards, DPP, CCH, dated August 2017, storm water quality measures shall be installed to treat the water quality volume.

More information is contained in the Preliminary Drainage Study for the New Aloha Stadium Entertainment District Environmental Impact Statement, See Appendix C.

4.2 Sanitary Sewer System

4.2.1 Existing Conditions

The existing wastewater collection system in the vicinity of the Aloha Stadium is operated and maintained by the CCH Department of Environmental Services (ENV) (See Figure 4-2). There is an existing 21-inch sewer main running east to west across the parking lot north of Halawa Stream with a 12-inch lateral that provides service to the stadium. This main gravity flows to the 24-inch main that runs parallel to Salt Lake Boulevard. The 24-inch main continues to the Halawa Pump Station at the southwest corner of the site along Salt Lake Boulevard. Running along Salt Lake Boulevard is a 21-inch force main exiting the Halawa Pump Station. The force main re-enters the site to a manhole located on the northwest end in the parking lot surrounding the stadium. The discharge then gravity flows offsite via a 30-inch main that runs along Kamehameha Highway and is ultimately treated at the CCH Honouliuli Wastewater Treatment Plant.

Along the eastern and southern portions of the parking lot adjacent to the existing stadium, there is a Navy main line that ranges in size from 12- to 18-inches and runs from east to west. This main eventually connects into the 24-inch Navy sewer line along Salt Lake Boulevard.
4.2.2 Connection to the City and County Sewer System

A preliminary average daily sewer demand was submitted to ENV for review based on the program information below for the overall NASED development to confirm the available capacity in the CCH’s wastewater system to accommodate the proposed development. See Appendix A for average flow calculations.

<table>
<thead>
<tr>
<th>Phase / Date of Connection</th>
<th>Stadium Seats (th)</th>
<th>Retail (DF)</th>
<th>Entertainment (DF)</th>
<th>Food &amp; Beverage (DF)</th>
<th>Restaurant (DF)</th>
<th>Office (DF)</th>
<th>Hotel Rooms (DF)</th>
<th>Hotel Mgr. Space (DF)</th>
<th>Residential Units (DF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1A - 2023</td>
<td>35,000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Phase 1B - 2026</td>
<td>0</td>
<td>65,135</td>
<td>0</td>
<td>71,810</td>
<td>8,000</td>
<td>76,939</td>
<td>244</td>
<td>24,500</td>
<td>745</td>
</tr>
<tr>
<td>Phase 2 - 2035</td>
<td>0</td>
<td>0</td>
<td>38,364</td>
<td>104,975</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>696</td>
</tr>
<tr>
<td>Phase 3 - 2045</td>
<td>0</td>
<td>0</td>
<td>75,566</td>
<td>106,722</td>
<td>8,000</td>
<td>75,252</td>
<td>387</td>
<td>37,800</td>
<td>408</td>
</tr>
<tr>
<td>Total</td>
<td>35,000</td>
<td>65,135</td>
<td>117,933</td>
<td>333,557</td>
<td>16,000</td>
<td>152,201</td>
<td>631</td>
<td>62,100</td>
<td>1,849</td>
</tr>
</tbody>
</table>

In a letter dated May 11, 2020, ENV responded indicating that the current flow allocation for Aloha Stadium is based on 50,000 seats at 5 gallons per day (gpd) per seat, or 250,000 gpd total (See Appendix A). ENV confirmed that redevelopment of the site which does not exceed this flow allocation is acceptable, and therefore the proposed Phase 1A with average flow of 175,000 gpd is allowed. However, ENV noted that the existing wastewater conveyance system has limited additional capacity available and other development projects, including the State’s relocation of the Oahu Community Correctional Center to Halawa which currently has an approved sewer connection, will take most if not all of the remaining capacity. The current system capacity would not be able to accommodate the Phase 1B by the proposed 2026 connection date.

ENV indicates that the existing capacity limitations and proposed Capital Improvement Project Program for more capacity are described in the Honolulu/Waipahu/Pearl City Wastewater Conveyance Facilities, Draft Environmental Impact Statement, and that proposed schedule in the document shows the wastewater improvement projects will be completed in 2037. These improvements will accommodate Construction Phases 1B, 2 and 3 of proposed NASED project.

Given the limited sewer capacity available for the ancillary development, once an updated proposed program is developed by the selected P3 Developer team, it is recommended that detailed sewage flow quantities and a Sewer Connection Application (SCA) be submitted to the City to confirm the adequacy of the CCH wastewater collection system or identify capacity limitations and improvements required to accommodate the proposed development.
The DPP Wastewater Branch (WWB) reviews and approves SCAs for developments which require sanitary sewer service. An approved SCA would be valid for a 2-year period.

Upon approval of the SCA, complete construction plans shall be submitted by the selected P3 Developer, reviewed, and approved by WWB within two (2) years. Construction is required to commence within one (1) year after approval of plans. An updated or revised sewer connection application could be submitted to request an extension, if required for project completion. However, extension or approval of the updated SCA is subject to agency review and is not readily ascertained.

4.2.3 Proposed Improvements

Sewage flows from proposed development will be collected by new sewer lines within the proposed access roads and will connect to the existing 21-inch line running east to west across the parking lot north of Halawa Stream. The proposed on-site sewer improvements will consist of new sewer manholes, cleanouts, and underground piping to provide lateral connections to the new buildings (See Figure 4-5).

New sewer lateral locations and sizes will be verified during the design phase. Based on the proposed layout relocation of the existing 21-inch force main will need to be relocated to avoid conflict with the new stadium location. Coordination with the City and establishment of new sewer easements will be required for the proposed relocation. It should be noted that the relocation of the Hālawa Pump Station and the force main has been proposed by the CCH in the Honolulu/Waipahu/Pearl City Wastewater Conveyance Facilities, Draft Environmental Impact Statement.

Trenching and backfilling of proposed sewer lines will follow CCH standards and the Soils Engineers recommendations.

Upon City approvals of the Sewer Connection Application(s), and construction plans, along with payment of the sewer facilities charges, the proposed system can be connected to the City sewer system.

4.3 Water Supply System

4.3.1 Existing Conditions

Water for domestic use and fire protection is provided to the project site and surrounding vicinity through the CCH Board of Water Supply (BWS) municipal water system (See Figure 4-3). The offsite BWS water system in the vicinity of the project site consists of 36-inch concrete cylinder pipes running along both Salt Lake Boulevard and the Moanalua Freeway. A looped 36-inch water line runs around the eastern and southern portion of the parking lot adjacent to the stadium connecting the 36-inch water lines that run along Moanalua Road and Salt Lake Boulevard. The looped 36-inch water line has two 8-inch laterals with 8-inch meters (M/N#03182022 and 03182025) on the east and west of the stadium that connects to a looped 8-inch water line running around the interior of the stadium. Five of the six fire hydrants that surround the stadium are connected to the 8-inch line.

Running along Moanalua Freeway is a 20-inch non-potable ductile iron line. Tapping off of the 20-inch non-potable line at the north corner of the stadium, is an 8-inch lateral with a 6-inch meter (M/N# 05150000) and a fire hydrant.

In addition, there is a 24-inch Navy water line crossing over the northeast end of the site property along Aiea Access Road. Also connected to the 36-inch main at the southwest corner of the project site along Salt Lake Boulevard is a 1.5-inch meter (M/N# 11060137) and a 2-inch water meter (M/N# 10070050). The 1.5-inch meter serves the Halawa Sewer Pump Station and is owned by the City and County of Honolulu.

According to water meter records from the BWS 2018 fiscal year and 2019 fiscal year billing, the existing average daily water usage is 54,708 gpd. (See Appendix B)
4.3.2 Connection to Board of Water Supply System

On August 23, 2019, a letter was submitted to the BWS requesting information on the availability of water for the project and water pressure information for fire hydrants in the vicinity of the project site. This initial letter was based on programming for the proposed development and the estimated average daily water demand shown below (See Appendix B for supporting calculations).

<table>
<thead>
<tr>
<th>Facility</th>
<th>Area/Count</th>
<th>Avg. Daily Water Demand (gpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stadium/Mixed Use</td>
<td>52 acres</td>
<td>157,143</td>
</tr>
<tr>
<td>Residential</td>
<td>908 units</td>
<td>272,400</td>
</tr>
<tr>
<td>Hotel</td>
<td>648 units</td>
<td>194,400</td>
</tr>
<tr>
<td>Park</td>
<td>2 acres</td>
<td>8,520</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td></td>
<td><strong>632,463 gpd</strong></td>
</tr>
</tbody>
</table>

On April 7, 2020, the BWS responded stating that based on current data, the existing water system is adequate to accommodate the proposed development scenarios (See Appendix B). BWS record information indicates the water supply systems along Moanalua Road, Ohialomi Place, Ohenana Loop, Kahua'ani Street, and Salt Lake Boulevard have a calculated fire flow capacity of 4,000 gallons per minute. The final decision on the availability of water will be made when the building permit application is submitted for approval. BWS also indicated that irrigation from the proposed redevelopment will be required to connect to the existing 8-inch non-potable waterline north of the Aloha Stadium parcel which is part of the BWS Kalauao Spring Brackish Water System.

4.3.3 Proposed Improvements

On-site water system improvements will consist of new water meter(s) to provide domestic and fire protection water service for the proposed project site. Water connection(s) to the existing BWS system is anticipated to be from the existing 36-inch water main and will be confirmed when construction plans for the proposed project are submitted to BWS for review and approval. Based on the proposed layout a section of the existing 36-inch BWS water main will need to be relocated to avoid conflict with the new stadium location. New backflow preventers, valves, and underground piping will also be required. New fire hydrants and fire access roads will be provided as required to ensure adequate fire protection for the proposed buildings.
Trenching and backfilling of proposed water lines will follow BWS standards and the Soils Engineers recommendations. During the design phase, the calculated water demands from the proposed project will determine appropriate required meter and lateral size. Conceptual water system improvements to support the proposed NASED are shown in Figure 4-5.

4.4 Natural Gas

4.4.1 Existing Conditions

Synthetic natural gas (SNG) service is provided to Aloha Stadium by Hawaii Gas (HG). Record drawings indicate that two 2-inch laterals, which are connected to a 4-inch gas main running along Salt Lake Boulevard, are located at the south-west end of the stadium. A 16-inch gas main also runs down Salt Lake Boulevard, parallel to the 4-inch main (See Figure 4-4).

4.4.2 Proposed Improvements

Further coordination with HG by the selected P3 developer’s mechanical engineer will be required during the design phase to confirm fuel system service connections. The proposed fuel system demand required by the project will be needed at that time and determine the proposed improvements required.
5. REFERENCES


3. “Storm Drainage Standards”, Department of Planning and Permitting, City and County of Honolulu, August 2017.


9. “Environmental Impact Statement Preparation Notice Honolulu/Waipahu/Pearl City Wastewater Conveyance Facilities”, Department of Environmental Services, City and County of Honolulu, March 2019

May 11, 2020

Mr. Mason Suga
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96820

Dear Mr. Suga:

SUBJECT: Aloha Stadium Environmental Impact Statement
Sewer Flow Calculations

In response to your e-mail of April 24, 2020, transmitting the revised table of average wastewater flows for Phases 1A, 1B, 2, and 3 of the Aloha Stadium redevelopment project (copy attached), the current flow allocation for Aloha Stadium is based on 50,000 seats at 5 gallons per day (gpd) per seat, or 250,000 gpd total. We confirm that redevelopment of the site which does not exceed this flow allocation is acceptable, and therefore the proposed Phase 1A with average flow of 175,000 gpd is allowed.

We are not able to confirm capacity will be available for the proposed Phase 1B, which would add 323,874 gpd to the Phase 1A flow, for a total of 498,874 gpd, by your proposed schedule date of 2026. The existing wastewater conveyance system has limited additional capacity available. We anticipate other development projects, including the State’s relocation of the Oahu Community Correctional Center to Halawa which currently has an approved sewer connection, will take most if not all of the remaining capacity.

The existing capacity limitations and proposed Capital Improvement Project Program for more capacity are described in the “Honolulu/Waipahu/Pearl City Wastewater Conveyance Facilities, Draft Environmental Impact Statement”, December 2019, (DEIS) published in the State Office of Environmental Quality Control’s “The Environmental Notice”, January 8, 2020. The proposed schedule in the DEIS shows the wastewater improvement projects will be completed in 2037. These improvements will accommodate both Phase 2 and 3 of the Aloha Stadium redevelopment. As we proceed with the planning of our wastewater projects, we will look for opportunities to accomplish the work sooner so they can be done by your proposed schedule of 2035 for Phase 2.

Should you have any questions, please call Jack Pobuk, Program Coordinator, at (808) 768-3464 or email j pobuk@hawaii.gov.

Sincerely,

[Signature]

Lori M.K. Kahikina, P.E.
Director

Attachment
1. Construction of new inner ring road
2. Construction of new surface parking infill
3. Repair and resurface of existing parking

1. Construction of new stadium club / amphitheater buildings
2. Construction of new amphitheater support buildings / terracing / trellis

Note: The amphitheater is not part of the base stadium nor the ancillary development program outlined in the market study.
1. CONSTRUCTION OF BELOW GRADE PARKING ON HART PARCEL
2. CONSTRUCTION OF NEW RETAIL / RESIDENTIAL / HOTEL TOWERS ON HART PARCEL
3. RELOCATION OF BUS STATION
4. CONSTRUCTION OF NEW BELOW GRADE PARKING / BUILDINGS SOUTHEAST OF STADIUM
5. CONSTRUCTION OF NEW LAND BRIDGE OVER SALT LAKE BOULEVARD

PHASE 1B
1. DEMOLITION OF EXISTING PARKING LOT.
2. CONSTRUCTION OF NEW ROAD NETWORK.
3. CONSTRUCTION OF NEW MIXED USE BUILDINGS (RETAIL AND RESIDENTIAL) AND SUPPORTING PARKING IN SEQUENCE AROUND THE INNER RING ROAD.

PHASE 2
1. DEMOLITION OF EXISTING PARKING LOT.
2. CONSTRUCTION OF NEW ROAD NETWORK.
3. CONSTRUCTION OF NEW MIXED USE BUILDINGS (RETAIL AND RESIDENTIAL) AND SUPPORTING PARKING IN SEQUENCE AROUND THE INNER RING ROAD.
APPENDIX B

Existing Average Monthly Water Usage

Request Letter for Adequacy Inquiry and Pressure Data submitted August 23, 2019

Water Availability Response Letter from BWS dated April 7, 2020
<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Month</th>
<th>Water Consumption (Thousand Gallons)</th>
<th>Water Consumption (gpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>July</td>
<td>2,144</td>
<td>71,467</td>
</tr>
<tr>
<td></td>
<td>August</td>
<td>1,891</td>
<td>63,033</td>
</tr>
<tr>
<td></td>
<td>September</td>
<td>1,938</td>
<td>64,600</td>
</tr>
<tr>
<td></td>
<td>October</td>
<td>1,824</td>
<td>60,800</td>
</tr>
<tr>
<td></td>
<td>November</td>
<td>1,663</td>
<td>55,433</td>
</tr>
<tr>
<td></td>
<td>December</td>
<td>1,424</td>
<td>47,467</td>
</tr>
<tr>
<td></td>
<td>January</td>
<td>1,431</td>
<td>47,700</td>
</tr>
<tr>
<td></td>
<td>February</td>
<td>1,101</td>
<td>38,700</td>
</tr>
<tr>
<td></td>
<td>March</td>
<td>1,054</td>
<td>35,133</td>
</tr>
<tr>
<td></td>
<td>April</td>
<td>1,315</td>
<td>43,833</td>
</tr>
<tr>
<td></td>
<td>May</td>
<td>1,542</td>
<td>51,400</td>
</tr>
<tr>
<td></td>
<td>June</td>
<td>1,795</td>
<td>59,833</td>
</tr>
<tr>
<td>2019</td>
<td>July</td>
<td>1,935</td>
<td>64,500</td>
</tr>
<tr>
<td></td>
<td>August</td>
<td>1,655</td>
<td>55,167</td>
</tr>
<tr>
<td></td>
<td>September</td>
<td>1,790</td>
<td>59,667</td>
</tr>
<tr>
<td></td>
<td>October</td>
<td>1,553</td>
<td>51,787</td>
</tr>
<tr>
<td></td>
<td>November</td>
<td>2,009</td>
<td>69,067</td>
</tr>
<tr>
<td></td>
<td>December</td>
<td>1,486</td>
<td>49,533</td>
</tr>
<tr>
<td></td>
<td>January</td>
<td>1,574</td>
<td>52,467</td>
</tr>
<tr>
<td></td>
<td>February</td>
<td>1,449</td>
<td>48,300</td>
</tr>
<tr>
<td></td>
<td>March</td>
<td>1,629</td>
<td>54,300</td>
</tr>
<tr>
<td></td>
<td>April</td>
<td>1,785</td>
<td>59,500</td>
</tr>
<tr>
<td></td>
<td>May</td>
<td>2,084</td>
<td>69,467</td>
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<tr>
<td></td>
<td>June</td>
<td>1,319</td>
<td>43,967</td>
</tr>
<tr>
<td></td>
<td>Average Daily Usage</td>
<td>54,708</td>
<td></td>
</tr>
</tbody>
</table>

*Water consumption data from the Board of Water Supply 2018 FY and 2019 FY billing. Billing for water meters identified by meter numbers 03182022, 03182025, 10070060

10422-01
August 23, 2019

City and County of Honolulu
Board of Water Supply
Customer Care Division
630 South Beretania Street
Honolulu, HI 96843

Attention: Mr. Robert Chun

Subject: Aloha Stadium EIS

Dear Mr. Chun:

Wilson Okamoto Corporation is the civil engineering consultant for the Stadium Authority and the Department of Accounting and General Services (DAGS) which proposes to redevelop the existing Aloha Stadium and its surrounding parking lots to a new stadium and a mixed-use facility. Along with the new stadium, the proposed facility will include retail, entertainment, restaurant, office, civic, hotel, and residential uses. The project site is approximately 95.18 acres and is identified by Tax Map Key(s): 9-9-003/061, 062 & 071 (See attached TMK).

At this time we would like your assistance in determining the adequacy of the existing BWS storage and water distribution system in the vicinity of the project site to support the proposed project. Three options are being considered for the redevelopment of the property. Descriptions of the projected average daily water demand are as follows:

**Proposed Program – Stadium Option A**

<table>
<thead>
<tr>
<th>Facility</th>
<th>Zoning Designation</th>
<th>Count</th>
<th>Gal/day/unit</th>
<th>Avg. Daily Demand (gpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stadium/Mixed-use</td>
<td>Commercial Only</td>
<td>52</td>
<td>3,000</td>
<td>157,143</td>
</tr>
<tr>
<td>Residential</td>
<td>Multi-Family High Rise</td>
<td>908</td>
<td>300</td>
<td>272,400</td>
</tr>
<tr>
<td>Hotel</td>
<td>Multi-Family High Rise</td>
<td>648</td>
<td>300</td>
<td>194,400</td>
</tr>
<tr>
<td>Park</td>
<td>Park</td>
<td>2</td>
<td>4,000</td>
<td>8,520</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>832,463</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1907 S. Beretania Street, Suite 400 • Honolulu, Hawaii • 96826 • (808) 946-2277
Proposed Program – Stadium Option B

<table>
<thead>
<tr>
<th>Facility</th>
<th>Zoning Designation</th>
<th>Count</th>
<th>Gall/day/unit</th>
<th>Avg. Daily Demand (gpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stadium/Mixed-use</td>
<td>Commercial Only</td>
<td>48 acres</td>
<td>3,000 gpd/acre</td>
<td>144,810 gpd</td>
</tr>
<tr>
<td>Residential</td>
<td>Multi-Family High Rise</td>
<td>1,310 units</td>
<td>300 gpd/unit</td>
<td>393,000 gpd</td>
</tr>
<tr>
<td>Hotel</td>
<td>Multi-Family High Rise</td>
<td>640 units</td>
<td>300 gpd/unit</td>
<td>192,000 gpd</td>
</tr>
<tr>
<td>Park</td>
<td>Park</td>
<td>2 acres</td>
<td>4,000 gpd/acre</td>
<td>9,120 gpd</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>738,930 gpd</strong></td>
</tr>
</tbody>
</table>

Proposed Program – Stadium Option C

<table>
<thead>
<tr>
<th>Facility</th>
<th>Zoning Designation</th>
<th>Count</th>
<th>Gall/day/unit</th>
<th>Avg. Daily Demand (gpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stadium/Mixed-use</td>
<td>Commercial Only</td>
<td>83 acres</td>
<td>3,000 gpd/acre</td>
<td>187,740 gpd</td>
</tr>
<tr>
<td>Residential</td>
<td>Multi-Family High Rise</td>
<td>986 units</td>
<td>300 gpd/unit</td>
<td>295,800 gpd</td>
</tr>
<tr>
<td>Hotel</td>
<td>Multi-Family High Rise</td>
<td>1,065 units</td>
<td>300 gpd/unit</td>
<td>319,500 gpd</td>
</tr>
<tr>
<td>Park</td>
<td>Park</td>
<td>3 acres</td>
<td>4,000 gpd/acre</td>
<td>11,480 gpd</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>814,520 gpd</strong></td>
</tr>
</tbody>
</table>

In addition to your review of the existing water system adequacy, we would like to obtain pressure and flow information for the existing fire hydrants located in the vicinity of the project site. The hydrant numbers are (See attached BWS System Map).

- L03370
- L01368
- M07390
- LP0396
- L03385
- L05876
- M06848

Please call 946-2277 should you have any questions or require additional information.

Sincerely,

Mason M. M. Suga, P.E.
Project Manager

Enclosures:  TMK map
           BWS System Map

---

Mr. Mason Suga, P.E.
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Suga:


Thank you for the opportunity to comment on the proposed Aloha Stadium Redevelopment project.

The existing water system is generally adequate to accommodate the water requirements for the proposed redevelopments. However, we reserve further comments on the proposed project until site plans are submitted for our review. Please be advised that this information is based upon current data, and therefore, the Board of Water Supply (BWS) reserves the right to change any position or information stated herein up until the final approval of the building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

There are large BWS transmission mains that border the Aloha Stadium parcel. These water mains and any proposed water mains should be located within paved roadways to ensure accessibility and made accessible for repairs and maintenance. Any water connections and proposed structures shall be designed and built to our Water System Standards, such that adequate setback from water main easements are maintained for the safety of the public and to prevent any damage to structures due to unforeseen breaks, repair, and maintenance events. The construction drawings should be submitted for our review.

The proposed redevelopment is near the BWS Makalapa Spring Brackish Water System and will be required to connect to this system as a non-potable water source for irrigation and other application where applicable, as a means to conserve potable water. For your information, there is an existing non-potable water meter and 8-inch water line north of the Aloha Stadium parcel.

Water for Life... Ka Moi Ola
The estimated nonpotable water requirements should be included in the Environmental Impact Statement, as well as an adjusted potable water demand. The availability of nonpotable water will be confirmed when the building permits are submitted for review and approval. The BWS reserves the right to change the project requirements up until the service agreement is executed.

The developer will be required to submit construction drawings for our review and approval. The construction schedule should be coordinated with BWS to minimize impact to our water system.

Water conservation measures are required for all proposed developments. These measures include utilization of nonpotable water for irrigation, using rain catchments to retain and reuse stormwater, drought tolerant landscaping, efficient irrigation systems, such as a drip system and moisture sensors and weather-based irrigation controllers, and the use of Water Sense labeled high efficiency water fixtures and faucets.

The proposed development will be required to meet BWS cross-connection control and backflow prevention requirements. The requirements will be determined when the building permit application is submitted for our review and approval. If water is required during construction, all connections to the BWS system will require BWS approved reduced pressure principle backflow prevention assemblies.

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

The BWS has suspended fire flow tests on fire hydrants as a water conservation measure. However, you may use the following calculated flow data:

<table>
<thead>
<tr>
<th>Fire Hydrant Number</th>
<th>Location</th>
<th>Static Pressure (psi)</th>
<th>Residual Pressure (psig)</th>
<th>Flow (gpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L033358</td>
<td>Moanalua Rd.</td>
<td>58</td>
<td>48</td>
<td>4,000</td>
</tr>
<tr>
<td>L03370</td>
<td>Ohalani Pl.</td>
<td>80</td>
<td>63</td>
<td>4,000</td>
</tr>
<tr>
<td>L03385</td>
<td>Ohehena Lp.</td>
<td>82</td>
<td>42</td>
<td>4,000</td>
</tr>
<tr>
<td>L05876</td>
<td>Moanalua Rd.</td>
<td>67</td>
<td>56</td>
<td>4,000</td>
</tr>
<tr>
<td>M036468</td>
<td>Kahaupanui St.</td>
<td>83</td>
<td>66</td>
<td>4,000</td>
</tr>
<tr>
<td>M073350</td>
<td>Salt Lake Blvd.</td>
<td>85</td>
<td>59</td>
<td>4,000</td>
</tr>
</tbody>
</table>

The data are based on the existing water system, and the static pressure represents the theoretical pressure at the point of calculation with the reservoir full and no demands on the water system. The static pressure is not indicative of the actual pressure in the field. Therefore, to determine the flows that are available to the site, you will have to determine the actual field pressure by taking on-site pressure readings at various times of the day and correlating that field data with the above hydraulic design data.

Fire Hydrant LP0396 is a private fire hydrant. The BWS does not maintain or provide information regarding private hydrants and water systems.

The map showing the location of the fire hydrants is attached.

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

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

Very truly yours,

[Signature]

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

Attachment
APPENDIX C

Preliminary Drainage Study for the New Aloha Stadium Entertainment District
Environmental Impact Statement
New Aloha Stadium Entertainment District - EIS

Drainage Study

TABLE OF CONTENTS

I. INTRODUCTION........................................................................................................... 1
   A. General ................................................................................................................ 1
   B. Site Location and Project Description ................................................................ 1

II. EXISTING DRAINAGE CONDITIONS ................................................................... 3
   A. Existing Topography .......................................................................................... 4
   B. Soils .................................................................................................................... 4
   C. Flood Hazard ..................................................................................................... 4
   D. Drainage ............................................................................................................ 7

III. PROPOSED DRAINAGE CONDITIONS ................................................................. 10

IV. HYDROLOGY ANALYSIS ....................................................................................... 12
   A. Design Criteria .................................................................................................. 12
   B. Peak Flow Calculations ..................................................................................... 12
      1. Rational Method .............................................................................................. 12
         a) Runoff Coefficient (C) .................................................................................. 12
         b) Rainfall Intensity (I') ...................................................................................... 13
         c) Drainage Area (A) .......................................................................................... 13
         d) Results ........................................................................................................... 13

V. DISCUSSION ............................................................................................................. 13

VI. REFERENCES ......................................................................................................... 14

APPENDIX

PRELIMINARY
DRAINAGE STUDY

FOR THE

NEW ALOHA STADIUM ENTERTAINMENT DISTRICT
ENVIRONMENTAL IMPACT STATEMENT

Honolulu, Oahu, Hawaii
Tax Key Map: 9-9-003:055, 061, 070, 071

Prepared for:
Crawford Architects
737 Bishop Street, Suite 2870
Honolulu, HI 96813

Prepared by:
Wilson Okamoto Corporation
Engineers and Planners
1907 South Beretania Street, Suite 400
Honolulu, HI 96826
WOC Job No. 10422-03

June 2020
LIST OF FIGURES

Figure A: Vicinity Map ................................................................. 2
Figure B: Soil Classification Map ................................................. 5
Figure C: Flood Insurance Rate Map .............................................. 6
Figure D: Existing Drainage Condition Map .................................... 9
Figure E: Proposed Drainage Condition Map .................................. 11

APPENDIX A

Table 1a,1b: Existing Peak Flow Calculations ..................................... A-2
Table 2a, 2b: Proposed Peak Flow Calculations .................................. A-3

APPENDIX B

Plate 1: 10-year, 1-hour Rainfall .................................................. B-2
Plate 2: Overland flow Chart – Existing .......................................... B-3
Plate 3: Correction Factor – Existing ................................................ B-3
Plate 4: Overland flow Chart – Proposed ......................................... B-4
Plate 5: Correction Factor – Proposed ............................................. B-4
Plate 6: Runoff Coefficient (0.8 and 0.1) for Surface Types ................ B-5

I. INTRODUCTION

A. General

The existing Aloha Stadium site consists of paved parking, the Aloha Stadium, and various site features. The state of Hawai‘i’s Department of Accounting and General Services (DAGS) is proposing to construct a new stadium facility along with ancillary development to create a New Aloha Stadium Entertainment District. The proposed development area is 97.08 acres.

The purpose of this report is to assess the impact of the proposed Construction Phase 1A and 1B development on the existing drainage conditions of the area, and to recommend any drainage improvements, as required in conjunction with the Programmatic Environmental Impact Study (PEIS).

B. Site Location and Project Description

The project site, identified by TMKs: 9-9-003-055, 061, 070, 071, is located in Honolulu on the island of Oahu. The street address of the project site is 99-500 Salt Lake Boulevard, Honolulu, HI 96818. The project site is bounded by Kamehameha Highway to the north, Salt Lake Boulevard to the west, Moanalua Freeway to the east, and Queen Liliuokalani Freeway to the south. (See Figure A).

Phase 1A and 1B of the Aloha Stadium development project consists of the construction of the following:

- A stadium
- A loading dock area
- A staff parking lot
- An inner ring road
- Repair and resurface of existing parking lots
- An outdoor amphitheater
- Amphitheater buildings
- Retail, residential, and hotel towers
- Parking structure for HART Stations

The entire redevelopment, upon completion will have options to include – spectators stadium and field, hotel, HART station plaza, mixed-use retail, pedestrian promenade, entertainment district, office campus, swap meet, amenities for cultural, educational, and recreational purposes, residential building,
surface and structural parking. The site will be cleared to remove pavement and other site structures which conflict with the proposed improvements. Utilities that do not conflict with the proposed improvements are to remain unless otherwise noted.

The proposed improvements are conceptual and subject to change based on further development of plans and availability of additional information. It will be up to the developer/design teams to provide supplemental environmental documentation beyond what is being addressed in the Programmatic Environmental Impact Statement (PEIS). The conceptual layouts that are being analyzed for the PEIS do not constitute any final locations or pre-specified zones for any phases of the project, but instead serve to create a ‘case study’ for analysis. The development/design teams selected will undertake their own market analysis and determine the program and actual building locations/phasing plan for the project within the ultimate range of the PEIS established for the NASED development.
II. EXISTING DRAINAGE CONDITIONS

A. Existing Topography

The project site topography varies greatly in elevation throughout as it has been built up with the stadium, concrete walkways, and paved parking areas. The existing elevation of the field in the Aloha Stadium is 20-feet above mean sea level (MSL) while the parking lot surrounding the stadium varies from 55-feet to 30-feet above MSL. The parking lot just north of Halawa Stream generally slopes from north to south with elevations ranging from 28-feet to 16-feet above MSL. The parking lot just south of Halawa Stream generally slopes from east to west with elevations ranging from 26-feet to 14-feet above MSL. Existing storm runoff from rainfall on or within the development area sheetflows and is collected by onsite storm drain inlets throughout the site and discharge to Halawa Stream.

B. Soils

Soil series and mapping units for the island of Oahu are found in maps on the United States Department of Agriculture online web soil survey and soil physical properties are found in the “Soil Survey of islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii” dated January 1, 1972, prepared by the U.S. Department of Agriculture, Soil Conservation Service (currently Natural Resources Conservation Services). The underlying soil within the project site consists of: Hanalei silty clay, Honolulu clay, Kawaihapa clay, Lahaina silty clay, Makalapa clay, Rock Land, Water, and Waipahu Silty Clay (See Figure B). The soil has characteristics described below:

Hanalei Silty Clay, 2 to 6 percent slopes (HnB): On this soil, runoff is slow and the erosion hazard is slight.

Honolulu Clay, 0 to 2 percent slopes (HxA): This soil occurs in the lowlands along the coastal plains and permeability is moderately slow. Runoff is slow and the erosion hazard is no more than slight.

Kawaihapa Clay Loam, 0 to 2 percent slopes (KLA): This soil occupies smooth slopes and permeability is moderate. Runoff is slow, and the erosion hazard is no more than slight.

C. Flood Hazard

Lahaina Silty Clay, 0 to 3 percent slopes (LaA): On this soil, runoff is slow and the erosion hazard is no more than slight. This soil is used for sugarcane and pineapple.

Makalapa Clay, 2 to 6 percent slopes (MdB): This soil is gently sloping and permeability is slow. Runoff is slow and the erosion hazard is slight.

Rock Land (rBK): This land type is nearly level to very steep.

Waipahu Silty Clay, 0 to 2 percent slopes (WzA): This soil is nearly level and permeability is moderately slow. Runoff is slow or very slow, and the erosion hazard is none to slight.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Panel No: 15003 C0332 H dated November 5, 2014 shows that the project site is located within Zone X defined as an area determined to be outside the 500-year floodplain. The Zone X area is determined to be outside of the 0.2% annual chance of flood plain. Portions of the site along the northern border lie within Zone D. Zone D is defined as areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. It should also be noted that the City requires any new building that straddles more than one flood zone be constructed to comply with the most conservative zone.

The parcel is not located in the tsunami evacuation zone as established by the Oahu Civil Defense. (See Figure C).
D. Drainage

Majority of the storm water runoff generated within the project site currently sheetflows into several existing drain inlets onsite, which convey the storm water runoff to Halawa Stream. The existing topography of the project site divides the storm water runoff into eleven (11) drainage areas as follows: (See Figure D)

Storm water runoff from rainfall on or within basin E1 is collected by a series of drain inlets and is conveyed to a main drain line varying from 30- to 48-inches, which eventually discharges to Halawa Stream, denoted as DP1.

Storm water runoff from rainfall on or within basin E2 is collected by a series of drain inlets and is conveyed to a 54-inch main drain line which eventually discharges to Halawa Stream, denoted as DP2.

Storm water runoff from rainfall on or within basin E3 is collected by a series of drain inlets and is conveyed to a main drain line varying from 30- to 48-inches which eventually discharges to Halawa Stream, denoted as DP3.

Storm water runoff from rainfall on or within basin E4 sheetflows offsite to the landscape area on the ewa side of Queen Liliuokalani Freeway.

Storm water runoff from rainfall on or within basin E5 is collected by a drain inlet and is conveyed to a 30-inch drain line which eventually discharges to Halawa Stream, denoted as DP4.

Storm water runoff from rainfall on or within basin E6 is collected by a series of drain inlets and is conveyed to a main drain line varying from 24- to 36-inches which eventually discharges to Halawa Stream, denoted as DP5.

Storm water runoff from rainfall on or within basin E7 is collected by a series of drain inlets and is conveyed to a main drain line varying from 18- to 36-inches which eventually discharges to Halawa Stream, denoted as DP6.

Storm water runoff from rainfall on or within basin E8 is collected by a series of drain inlets and is conveyed to a main drain line varying from 18- to 30-inches which eventually connects to an existing catch basin along Salt Lake Boulevard, denoted as DP8.

Storm water runoff from rainfall on or within basin E9 is collected by a series of drain inlets and is conveyed to a main drain line varying from 18- to 30-inches which eventually connects to an existing catch basin along Salt Lake Boulevard, denoted as DP8.

Storm water runoff from rainfall on or within basin E10 sheetflows offsite to Kamehameha Highway.

Storm water runoff from rainfall on or within basin E11 sheetflows offsite to Salt Lake Boulevard.

The total drainage area for the project site was determined to be 97.08 acres and is comprised of eleven (11) drainage areas. The total existing storm runoff flow rate is 413.56 cfs.
III. PROPOSED DRAINAGE CONDITIONS

The proposed drainage patterns will match the existing drainage conditions to avoid impacts to the surrounding areas and the drainage systems downstream of the proposed development. The proposed improvements will divide the storm water runoff into eleven (11) drainage areas. Details are further described below. (See Figure E).

Storm water runoff from rainfall on or within Basin P1 will be collected by drain inlets throughout the parking lot and will be conveyed to the existing main drain line varying from 30- to 48-inches. The main line will eventually discharge to Halawa Stream, denoted as DP1.

Basin P2 will contain the development of an outdoor amphitheater and new buildings, which will result in the addition of landscaped area. The runoff from rainfall on or within Basin P2 will be collected by a series of drain inlets and will be conveyed to the existing 54-inch main drain line which eventually discharges to Halawa Stream, denoted as DP2.

Basin P3 will contain the development of the new stadium and buildings. Runoff from rainfall on or within Basin P3 will be collected by a series of drain inlets and will be conveyed to a main drain line varying from 30- to 48-inches which eventually discharges to Halawa Stream, denoted as DP3.

The extent of this drainage study assesses the drainage conditions of the development that occurs within Construction Phase 1A and 1B of the New Aloha Stadium Entertainment District (NASED). As such, basins P4, P5, P6, P7, P8, P9, P10, and P11 have not been analyzed for future development and will therefore match the existing drainage conditions.

The total drainage area for the project site was determined to be 97.08 acres and is comprised of eleven (11) drainage areas. The total proposed storm runoff flow rate is 397.40 cfs.
IV. HYDROLOGY ANALYSIS

A. Design Criteria

The total drainage area (97.08 acres) is less than 100 acres, without sump effects. As such, the hydrologic analysis is based on a 10-year storm runoff with 1-hour rainfall intensity for all flows. The rational method was used to determine peak discharge for the existing and proposed conditions. The estimated rainfall for the project location is 2.5 inches for a 10-year storm.

B. Peak Flow Calculations

1. Rational Method

Peak flows are determined by the Rational Method expressed as:

\[ Q = C \times I' \times A \]

where:

- \( Q \) = Flowrate in cubic feet per second (cfs)
- \( C \) = Runoff coefficient
- \( I' \) = Rainfall intensity in inches per hour for a duration equal to the time of concentration.
- \( A \) = Drainage area, in acres

a) Runoff Coefficient (C)

The “Rules Relating to Water Quality” dated July 2017, by the Department of Permitting and Planning, City and County of Honolulu, provides information for runoff coefficients of various ground covers. Runoff coefficients of 0.10 and 0.80 are selected for pervious and impervious surfaces, respectively. Selection is based on relation of site conditions to surface type descriptions provided in Table F (See Appendix B).

b) Rainfall Intensity (I’)

The design rainfall intensity and time of concentration were determined using the “Storm Drainage Standards” dated August 2017, by the Department of Permitting and Planning, City and County of Honolulu. A 10-year, 1-hour rainfall value of 2.5 inches/hour was used. (See Appendix B).

c) Drainage Area (A)

Limits of the drainage basins are delineated based on topographic features. There are eleven (11) basins for the existing and proposed conditions with a total area of 97.08 acres in both instances. Delineation of drainage areas for the existing condition is presented in Figure D, while delineation of drainage areas for the proposed condition is presented in Figure E.

d) Results

Peak flows in cubic feet per second as calculated by the Rational Method for both the existing and proposed conditions are shown in Tables 1a, 1b, 2a, and 2b in Appendix A. Total discharge from rainfall on or within project site under existing drainage conditions is 413.56 cfs. Total discharge from rainfall on or within project site under proposed drainage conditions is 397.40 cfs.

V. DISCUSSION

The peak discharge calculations for the existing and proposed drainage conditions of the project area are shown in the Hydrologic Calculation tables of Appendix A.

The total storm water runoff from the site under the existing drainage conditions for the project is 413.56 cfs. Under proposed drainage conditions, the runoff rate was calculated to be 397.40 cfs. In comparing the peak discharge of the existing and proposed drainage conditions for the project site, there is a decrease of 16.16 cfs in total runoff. The decrease in runoff can be primarily attributed to the relocated Aloha Stadium and the outdoor amphitheater, which replace a significant amount of impervious area with pervious surface. It should also be noted that there will be no increase in runoff to any of the individual drainage systems.

Based on the evaluation of the proposed development, no significant impact is anticipated to the adjacent properties, existing drainage patterns, and existing drainage systems.
VI. REFERENCES

1. “Storm Drainage Standards”, Department of Planning and Permitting, City and County of Honolulu, August 2017.


3. “Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii”, United States Department of Agriculture Soil Conservation Service in cooperation with University of Hawaii Agricultural Experiment Station, August 1972.


APPENDIX A

Table 1a  Weighted Runoff Coefficient – Existing Condition
Table 1b  Hydrologic Calculations – Existing Condition
Table 2a  Weighted Runoff Coefficient – Proposed Conditions
Table 2b  Hydrologic Calculations – Proposed Conditions
### Table 1: Weighted Runoff Coefficient - Existing Condition

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APPENDIX B

EXCERPTS FROM REFERENCE 1 - C&C STORM DRAINAGE STANDARDS

Plate 1  10-year, 1-hour Rainfall Intensity
Plate 2  Overland Flow Chart – Existing Condition
Plate 3  Correction Factor – Existing Condition
Plate 4  Overland Flow Chart – Proposed Condition
Plate 5  Correction Factor – Proposed Condition

EXCERPTS FROM REFERENCE 2 – C&C RULES RELATING TO WATER QUALITY

Plate 6  Runoff Coefficient for Surface Types
Existing Condition

Plate 2

Overland Flow Chart

Plate 3

CORRECTION FACTOR
FOR CONVERTING 1 HR RAINFALL TO RAINFALL INTENSITY
OF VARIOUS DURATIONS

TO BE USED FOR AREA
LESS THAN 100 ACRES
(See Plate 6 for area
more than 100 acres)

CORRECTION FACTOR
FOR CONVERTING 1 HR RAINFALL
TO RAINFALL INTENSITY
OF VARIOUS DURATIONS

TO BE USED FOR AREA
LESS THAN 100 ACRES
(See Plate 6 for area
more than 100 acres)

Proposed Condition

Plate 4

Overland Flow Chart

Plate 5
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Source: "Rules Relating to Water Quality", Department of Planning and Permitting, City and County of Honolulu, August 2017
Appendix K:

Electrical Infrastructure Report
NEW ALOHA STADIUM ENTERTAINMENT DISTRICT
ANTICIPATED ELECTRICAL SERVICE LOADS

Project: New Aloha Stadium Entertainment District
99-500 Salt Lake Boulevard
Aiea, Hawaii 96818

Prepared By: Hadi Tahai, PE
Fabian Serkis, PE, LEED AP BD+C
Pragmatic Professional Engineers

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Abstract
This document identifies the capacity of the existing electrical service to the Aloha Stadium project site and determines the anticipated electrical load for re-development of the site. Currently, the project site is served by a medium voltage 115-kiloVolt service, from Hawaiian Electrical via a primary meter. The electrical load calculation for the re-development is based on Master Plan Option B, dated January 15, 2020, which included fourteen separate buildings.
**Existing Electrical Infrastructure**

**DESCRIPTION**
The existing site is served by primary power service at 11.5-kiloVolt with a 125-ampere fuse. A preferred/alternate-scheme incoming service medium voltage loop from Hawaiian Electric is utilized.

**EXISTING ELECTRICAL SERVICE**
Existing service with the 125-ampere fuse under 11.5-kiloVolt would allow approximately 2,500,000 Watts of power usage. Per the Electrical Study dated December 11, 2009, the peak demand noted in the 1997 Electrical Power Distribution System Assessment Report for the stadium was approximately 2,100,000 Watts.

---

**Emergency Power System**
Existing system includes a 300-kiloWatt diesel generator with a fuel tank, which is not base-mounted, an associated automatic transfer switch, all distribution equipment, including a main switchboard, step-down transformers, 277/480-Volt panels, and 120/208-Volt panels. Existing equipment is at or near the end of its useful life. Per the conclusion of this document, we recommend demolishing the existing emergency power system and not re-using it for the re-developed project site.

**Anticipated Electrical Infrastructure**

**ASSUMPTIONS**
- Air-conditioning will be provided to hotels, restaurants, offices, suites within the stadium, and media rooms within the stadium.
- The following spaces, within Building 1.2, will have negligible electrical loads and shall not be included in the electrical load calculations:
  - Event Level Spaces
  - Seating Bowl
  - Vertical Circulation
- Parking lighting will have negligible electrical loads and shall not be included in the electrical load calculations.
- Electrical Load Assumptions:
  - Retail = 7-Watts/square-foot
  - Residential, Hotel = 7-Watts/square-foot
  - Stadium Suites/Media, Office, Restaurant = 9-Watts/square-foot
  - Stadium Concourse = 10-Watts/square-foot
  - Stadium Lighting = 400-lights @ 1,000-Watts each = 400,000-Watts
  - Demand Factor\(^2\) = 0.5

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\(^1\) Assumptions are based on experience and are for planning purposes only. Depending on the space-use, these quantities may vary significantly. Design team shall adjust values when more information on the type and nature of space-use becomes available.

\(^2\) To calculate demand load (actual maximum power use), a diversity factor shall be applied to the calculated connected load.
New Sub-Station Sizes

The electrical load of each building, based on the electrical load calculations and assumptions within this report, are as follows:

<table>
<thead>
<tr>
<th>Building</th>
<th>Space</th>
<th>Area [Square-Feet]</th>
<th>Power Usage [Watts / Sq.Ft] (See Note 3)</th>
<th>Total Watts per Line Item</th>
<th>Total Watts per Building</th>
<th>Proposed Sub-Station Size [kVA]</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1.1</td>
<td>Retail</td>
<td>62,250</td>
<td>7</td>
<td>438,750</td>
<td>5,766,500</td>
<td>2,500</td>
</tr>
<tr>
<td></td>
<td>Hotel</td>
<td>160,500</td>
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<td>1,123,500</td>
<td>1,500</td>
<td>2,500</td>
</tr>
<tr>
<td></td>
<td>Residential</td>
<td>991,750</td>
<td>7</td>
<td>6,942,250</td>
<td>4,199,623</td>
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<td></td>
<td>Restaurant</td>
<td>8,000</td>
<td>9</td>
<td>72,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1.2</td>
<td>Club Mezzanine</td>
<td>115,423</td>
<td>9</td>
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<td>2,500</td>
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<tr>
<td></td>
<td>Suites/Media</td>
<td>34,157</td>
<td>9</td>
<td>307,413</td>
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<tr>
<td></td>
<td>Concourse</td>
<td>174,484</td>
<td>10</td>
<td>1,744,840</td>
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<td></td>
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<td></td>
<td>Field Lighting</td>
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<td></td>
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<td>634,950</td>
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<td>1,500</td>
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<tr>
<td></td>
<td>Retail</td>
<td>46,550</td>
<td>7</td>
<td>325,850</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Residential</td>
<td>79,134</td>
<td>7</td>
<td>553,988</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1.4</td>
<td>Office</td>
<td>75,497</td>
<td>9</td>
<td>670,413</td>
<td>1,615,989</td>
<td>1,500</td>
</tr>
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<td></td>
<td>Retail</td>
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<td>7</td>
<td>360,479</td>
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<td>7</td>
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<tr>
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<td>Residential</td>
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<td>7</td>
<td>1,191,988</td>
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<td>1,512,483</td>
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<tr>
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<td>1,192,016</td>
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<tr>
<td></td>
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<td>9</td>
<td>72,000</td>
<td></td>
<td></td>
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<td>B3.2</td>
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<tr>
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<td>372,330</td>
<td></td>
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<td>2,500</td>
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<td>387,263</td>
<td>387,263</td>
<td></td>
<td>13,092,447</td>
</tr>
</tbody>
</table>

Total Watts: 26,185,294
Diversity Factor: 0.5
Demand Watts: 13,092,447

Conclusion

The existing sub-stations at Aloha Stadium will likely be demolished along with the stadium due to the re-development of this site. The anticipated electrical requirements of the re-development of this site are substantially larger than that which is currently supplied to the site; therefore, Hawaiian Electric should be consulted to determine the availability of power and feasibility of the upgrades.

Potential options for upgrading the service to this site include enhancing the existing medium voltage loop by providing an additional loop at this voltage or by providing a dedicated, on-site 46-kiloVolt sub-station with two 46-kiloVolt lines.

Upgrading the emergency generator and its power distribution would require a new emergency power system. Potential upgrades to the existing emergency power system may include a new 1,500-kiloVolt-ampere, 277/480-Volt diesel generator with an associated power distribution system. The generator would likely be installed in a weather-proof, sound-attenuated enclosure, and include a base-mounted fuel tank, for at least 8-hours of operation. Additional items which will likely be included are a 2,000-ampere automatic transfer switch, a 2,000-ampere, 277/480-Volt panel, and all required downstream emergency power distribution components. Design team shall develop proper size and type of emergency power system when further information becomes available.

Due to the extensive electrical work that the re-development will require, this may be a good opportunity to underground any power lines that are within the line-of-sight from the New Aloha Stadium Entertainment District.

References

1. Record electrical drawings of Aloha Stadium from 1974
2. Photos of South Electrical Room from site survey on January 14, 2020
3. Hawaiian Electric Line Extension and Substation (Rule No. 13)
5. Master Plan Option B Planning Gross Area Spreadsheet dated January 15, 2020
6. Electrical Site Plan dated 1999
7. One Line Diagram dated 1999
8. Electrical Service Study dated December 11, 2009
Appendix L:
EISPN Consultation Response Letters
Mr. Keola Cheng  
November 8, 2019  
Page 2

3. Add "Land Uses" to the categories for consideration in the Draft EIS (Section 1.2 of the EIS Preparation Notice). TOD will play an important role in land use decisions, as the entire site is within walking distance of the Halawa/Aloha Stadium rail transit station.

4. The Draft EIS should discuss what common, organizational framework, if any, is used to derive the land use configurations of the three Aloha Stadium Site Master Plan Options.

5. Please include in the Draft EIS a summary of the urban design elements in each option that contribute to: a) community building; b) place-making; c) a strong iconic presence; d) a strong rail transit station to stadium connection; e) protecting public views; and f) safe and secure pedestrian-friendly environment. Discuss how these elements are organized to visually and physically link the development sites to create a unified sense of place.

6. Although the three Aloha Stadium Site Master Plan Options in the EIS Preparation Notice are conceptual, it appears that they focus more on the office and entertainment sector, with minimal residential buildings. The DPP's recent TOD Demand Analysis and Market Projections study indicated little demand for offices (the full study can be viewed at Honolulu.gov/TOD). While the actual mix of uses will likely be up to the selected developer and market, we suggest reviewing those assumptions for the Draft EIS since office and residential have different impacts on traffic, water, wastewater, and other infrastructure.

7. The Draft EIS should provide a discussion of the opportunities for accessibility and connectivity between the Project and adjacent neighborhoods, and commercial centers by all modes of transportation.

8. The connection to the Pearl Harbor Historic Trail and the Arizona Memorial should be explored to improve non-vehicular travel options in the area. Improved pedestrian connectivity and bicycle circulation to these facilities are recommended in the Draft Final Halawa Area TOD Plan.

9. The Draft EIS should include an analysis of how important views will be protected, as well as wind considerations on stadium orientation.
10. The Draft EIS should include more detailed information on the phases of the proposed Project including how many phases there will be, what each phase of the development will consist of, and an estimated timeline.

11. The Draft EIS should include a discussion on if and how the residential component is consistent with the State's goal to increase supply of affordable housing on State-owned lands along the rail transit route.

12. Under the Climate Change category, discussion regarding sea level rise (SLR) should be based upon the State of Hawaii SLR Vulnerability and Adaptation Report and further guidance from the Honolulu Climate Change Commission. Generally, those areas immediately adjacent to the streams and drainage ways that empty into Pearl Harbor near the rail transit stations are within or immediately adjacent to the 3.2-foot SLR Exposure Area, as defined by the State SLR Report. The City and County of Honolulu has established a planning benchmark of 3.2 feet of additional SLR is appropriate for new development by mid-century. A planning benchmark of six feet of SLR is recommended for projects with a life-span beyond mid-century and for critical infrastructure. In both cases, high tide flooding and nuisance flooding may be present and precede global mean sea level rise by decades.

13. The Draft EIS should discuss the disposition of the monkeypod trees in the existing stadium parking lot, specifically whether the Project will require they be removed or maintained for their positive pedestrian and environmental effects. In the event they are removed, the Draft EIS should account for the impact their loss will have on decreasing carbon dioxide absorption and overwhelming already depleted tree stocks at island tree nurseries. If they will be re-planted back on-site, relocation specialists should be consulted regarding their storage, relocation, and post-transplantation best practices to ensure survival.

14. The Halawa Stream crossing the stadium site creates an opportunity for stream corridor improvements. Such improvements are called for within the Draft Final Halawa Area TOD Plan, but have not been described in any of the three options. The Draft EIS assessment should include examination of the potential for habitat regeneration and green infrastructure to improve both localized stream functions and downstream impact, in addition to passive recreational opportunities. Suggested stream improvements might include the removal of channelized walls and replacement with a soft berm, as well as the addition of a shared pedestrian/bikeway path above the berm. This approach contributes to green infrastructure and could reduce incidence of flooding in downstream residential area, currently in the less than one percent annual flood zone category.

15. The Draft EIS should include a Traffic Impact Analysis Report and Parking Assessment (analyzing possible impacts to surrounding neighborhoods) covering each of the options. A Traffic Management Plan with Traffic Demand Management measures should be provided once a preferred option is chosen. More detailed comments will be provided upon review of the Draft EIS.

16. The Draft EIS should include a narrative describing the Project's post-construction stormwater quality strategic plan pursuant to Section 20-3-50 of the "Rules Relating to Water Quality." The strategic plan shall include a written description of the proposed development, expected activities and pollutants that will be generated by activities at the site, and the low-impact development site design strategies that will be used to comply with the rules. The strategic plan shall also include a development schedule.

17. The Draft EIS should state that the development shall comply with the prevailing "Storm Drainage Standards" and will ensure the Project's compliance with the Rules Relating to Water Quality and Storm Drainage Standards. This compliance will be verified at the time that the grading/construction plans are submitted to the DPP for review.

18. The municipal wastewater system is available and adequate to accommodate the initial phase of the Project (Aloha Stadium replacement). Future development phases will need to be reevaluated for impacts to the wastewater system, which may require improvements to the wastewater system. Existing municipal sewer lines located on the project site will need to be relocated if structures are to be located over them. The Draft EIS should account for this phasing and identify funding sources to pay for the upgrades.

19. The Draft EIS should include a description on how the Project will comply with the City's Park Dedication requirements for residential/lodging components.
20. The Draft EIS should state the Project will need to comply with Subdivision Rules and Regulations for the realignment of Salt Lake Boulevard.

21. The Draft EIS should list all the permits involved in getting the Project approved and built.

Should you have any questions, please contact Franz Kraintz, of our staff, at 788-8046.

Very truly yours,

Eugene H. Takahashi
Deputy Director

KKS:ah

cc: The Honorable David Y. Ige
Governor of the State of Hawaii
Chris Kinimaka, Department of Accounting and General Services, State of Hawaii
Developers. Specifically, the final design, scale, and layout of both the New Aloha Stadium, as well as the ancillary development surrounding it will be determined by the District Developer(s), in partnership with the State.

5. The aforementioned NASED PMP discusses the urban design elements referenced in your letter.

6. Your suggestion has been shared with the project team for consideration in reviewing the conceptual designs and site layout for the Draft Programmatic EIS and the PMP. It will also be shared with the selected District Developer(s) who will prepare the final design and site layout. We concur that the proportionate mix of land uses will impact traffic and demand for water, wastewater, and other infrastructure.

7. Overall, as discussed in Section 4.11.2 (Multi-Modal Facilities) of the Draft Programmatic EIS, the Proposed Action is anticipated to increase and improve multi-modal facilities (pedestrian, bicycle, and transit) and connectivity within the Project Site and the surrounding area.

8. Connectivity with the Pearl Harbor Historic Tail and Arizona Memorial are evaluated and discussed in the aforementioned NASED PMP – refer to Section 2.3 Sustainability and Resilience under Subsection Establishing a Green Circulation Network.

9. Significant View-planes, as well as wind conditions are discussed and evaluated in both the subject PMP and Draft Programmatic EIS.

10. An overview of project phasing and implementation is included within the NASED PMP.

11. It is acknowledged that there is a need for additional affordable housing inventory and options across the state. Furthermore, recent events have shown that there is a shortage of affordable housing within proximity to Honolulu’s urban core.

As envisioned, the Proposed Action will directly serve this need through offering a diverse range of residential options accounting for upwards of 1,800 new residences. Proposed Action master planning and design efforts are ongoing, as a parallel process coupled with the project’s district procurement strategy. The subject district procurement process will select an ideal District Developer that will blend public funds with the resources and expertise of a private development and design team to leverage a better, higher-value outcome for all interested parties; public and private alike.

The selected District Developer’s final master plan and design scheme will comply with applicable affordable housing requirements. The Proposed Action’s residential offerings will provide needed housing inventory. The program and scope of these residential offerings are outlined and discussed in the subject Draft Programmatic EIS and Draft Programmatic Master Plan (which is appended to the Draft Programmatic EIS as an appendix).

The very nature of District Procurement will ensure a strong, inherent synergy between public and private interests that will reflect a unified response to the need for housing in Honolulu’s urban core.

An analysis of the current and anticipated housing market conditions in relation to the Proposed Action is provided in Chapter 4, Section 13.2.1 Population and Housing of the Draft Programmatic EIS. Additionally, in the Appendix A-1 Programmatic Master Plan (PMP) by Crawford Architects, the PMP addresses a variety of housing options in Chapter 2.6 Equity and Inclusion, under subsection Residential and Housing Diversity.

12. As the impacts of climate change are increasingly brought to the forefront of mainstream science as new data and research are made available, the greater development community has acknowledged an inherent social responsibility to promote sustainable, environmentally friendly, low-impact design for new buildings and structures. Chapter 2.3 Sustainability and Resilience of the NASED PMP outlines the sustainability initiatives and strategy that has been set forth for the implementation of the Proposed Action.

13. As mentioned previously, Project Design is still on-going, and it is anticipated that adjustments will be made to the conceptual designs and site layout presented in this Draft Programmatic EIS and the PMP during the design phase by the eventual selected District Developer. Specifically, the final design, scale, and layout of both the New Aloha Stadium, as well as the ancillary development surrounding, including project landscaping will be determined by the selected District Developer in partnership with the State. Nonetheless, should the removal of the referenced monkeypod trees be required, the selected District Developer will comply with all permitting and regulatory requirements.

14. The NASED PMP does not outline major improvements to Hālawa Stream. But, as referenced previously, the final design, scale, and layout of both the New Aloha Stadium, as well as the ancillary development surrounding it, including the Hālawa Stream will be determined by the selected District Developer.

15. The Proposed Action will seek to improve accessibility, connectivity, and mobility within the Project Site and surrounding community by creating a network of pedestrian walkways, bike paths, developing safer routes for mass transit and ride sharing options, and improvements made to major arterials that service the area. The Proposed Action will create multi-modal streets and paths that enhance the sense of place and accessibility of the surrounding community.

Existing traffic conditions as well as anticipated project related traffic impacts are discussed in the Draft Programmatic EIS. Refer to Chapter 4, Section 11: Traffic, which summarizes the findings and analysis conducted under a formal traffic study, which is appended to the Draft Programmatic EIS as Appendix H: Traffic Impact Assessment.
16. DFP’s request for a Post-Construction Stormwater Quality Strategic Plan, pursuant to Section 20-3-50 of the “Rules Relating to Water Quality” is acknowledged. The selected District Developer should fulfill this requirement pending the finalization of project design.

17. Your request is acknowledged, the Draft Programmatic EIS will reference that the proposed action will comply with the standards and requirements cited in your letter.

18. Thank you for confirming the adequacy of the municipal wastewater system to serve the initial phase (Phase 1A) of the Proposed Action. It is further acknowledged, and reflected in the Draft Programmatic EIS, that development beyond Phase 1A (Aloha Stadium Replacement) would potentially require improvements to the wastewater system.

19. The Draft Programmatic EIS outlines that the selected District Developer will comply with the City’s Park Dedication requirements.

20. The Draft Programmatic EIS will reflect that the Proposed Action will comply with Subdivision Rules and Regulations for the realignment of Salt Lake Boulevard.

21. A list of anticipated required permits and regulatory approvals is included in the subject Draft EIS. Refer to Section 5.3 Permits and Approvals of the Draft Programmatic EIS.

Your email, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
September 25, 2019

The Honorable David Ige
Governor of Hawaii
Executive Chambers, State Capitol
415 South Beretania Street
Honolulu, Hawaii 96813

Dear Governor Ige:

This is in response to a letter from the Wilson Okamoto Corporation requesting input on the Environmental Impact Statement Preparation Notice for the proposed creation of a New Aloha Stadium Entertainment District on the grounds of the existing Aloha Stadium site in Halawa.

Based on the information provided in the Office of Environmental Quality Control's The Environmental Notice, this project will have a significant impact on the services and operations of the Honolulu Police Department.

If there are any questions, Captain Aaron Farias of District 3 (Pearl City) may be contacted at 723-8603.

Sincerely,

Allan T. Nagata
Assistant Chief
Support Services Bureau

cc: Mr. Chris Kinimaka, Department of Accounting and General Services
Mr. Keola Cheng, Wilson Okamoto Corporation

The Environmental Notice

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hilawaw, Oahu, Hawai‘i

Dear Mr. Nagata

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS) Preparation Notice. We acknowledge your comments and concerns outlined in your letter dated September 25, 2019 (ref: AF-DK). They have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i’s Administrative Rules, Title 11, Chapter 200.1, Section 24.

We concur that development of the Proposed Action is anticipated to have a significant impact on the services and operations of the Honolulu Police Department. The Draft Programmatic EIS provides an assessment of the existing conditions, anticipated impacts and mitigation measures associated with HPD’s operations within Chapter 4, Section 14 Public Services and Facilities, Subsection 1 Police Fire, and Medical Services.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on the Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
Stacey Jones, Crawford Architects

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

TO: DLNR Agencies:  
- Div. of Aquatic Resources  
- Div. of Boating & Ocean Recreation  
- Engineering Division  
- Div. of Forestry & Wildlife  
- Div. of State Parks  
- Commission on Water Resource Management  
- Office of Conservation & Coastal Lands  
- Land Division – Oahu District  
- Historic Preservation

FROM: Russell Y. Tanji, Land Administrator

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed New Aloha Stadium Entertainment District

LOCATION: Halawa, Island of Oahu; TMK: (1) 9-9-003:061, and neighboring parcels 055, 070, & 071

APPLICANT: Waihona Corporation on behalf of Department of Accounting and General Services, State of Hawaii

Transmitted for your review and comment is information on the above-referenced project. The notice of availability of the EISP is has been published in O&QG’s official publication, The Environmental Notice (TEN), on September 08, 2019. This issue of the TEN and a link to the Draft SHS can be found at: http://oqg2.ohio.gov/The_Environmental_Notice/2019/09-08-TEN.pdf

Please submit comments by October 04, 2019. 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 Barbara Lee at 387-0453 or by email at barbara.j.lee@hawaii.gov. Thank you.

( ) We have no objections.  
( ) We have no comments.  
(x) Comments are attached.

Signed: /s/ M. Kaleo Manual

Print Name: Deputy Director  
Date: September 24, 2019

Attachments: Co: Central Files
There may be the potential for ground or surface water degradation/contamination and, therefore, the developer’s acceptance of any resulting requirements related to water quality.

The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.

A Water Construction Permit(s) is (are) required before the commencement of any well construction work.

A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.

A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.

A Petition to Amend the Intermittent Flow Standard is required for any new or expanded diversion(s) of surface water.

The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

OTHER:

If you have any questions, please contact Dean Ujino of the Commission staff at 587-0234.
Your letter, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: Environmental Impact Statement Preparation Notice for Proposed New Aloha Stadium Entertainment District
Location: Halawa, Island of Oahu
TMK(s): (1) 9-9-003:061
Applicant: Wilson Okamoto Corporation on behalf of Department of Accounting and General Services, State of Hawaii

COMMENTS
The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaii.nfip.org/FHAT).

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:
- **Oahu**: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- **Hawaii Island**: County of Hawaii, Department of Public Works (808) 961-8327.
- **Maui/Molokai/Lanai**: County of Maui, Department of Planning (808) 270-7253.
- **Kauai**: County of Kauai, Department of Public Works (808) 241-4896.

The applicant should include water demands and infrastructure required to meet project needs. Please note that the projects within State lands requiring water service from their local Department/Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

The applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections.

Signed: [Signature]
Date: 10/10/19

From:
Russell Y. Tsuji, Land Administrator

TO:
DLNR Agencies:
- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Div. of Forestry & Wildlife
- Div. of Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division – Oahu District
- Historic Preservation

Subject:
Environmental Impact Statement Preparation Notice for Proposed New Aloha Stadium Entertainment District

Location:
Halawa, Island of Oahu; TMK: (1) 9-9-003:061, and neighboring parcels 055, 670, & 071

Applicant:
Wilson Okamoto Corporation on behalf of Department of Accounting and General Services, State of Hawaii

Transmitted for your review and comment is information on the above-referenced project. The notice of availability of the EISP has been published in OBQC’s official publication, The Environmental Notice (TEN), on September 08, 2019. This issue of the TEN and a link to the Draft SEIS can be found at:
http://obqc2.doh.hawaii.gov/Backup/Environmental_Notice2019-09-08-TEN.pdf

Please submit comments by October 04, 2019. 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 Barbara Lee at 808-0453 or by email at barbara.lee@hawaii.gov. Thank you.

- We have no objections.
- We have no objections.
- Comments are attached.

Signed:
Gary S. Chang, Chief Engineer

Print Name:
Date: 10/10/19

Co: Central Files
The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA’s Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).”


Dear Mr. Chang:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS) Preparation Notice. We acknowledge your comments and concerns. They have been considered and incorporated in the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i’s Administrative Rules, Title 11, Chapter 280.1, Section 24.

The following is offered in response to your comments:

Comment #1: “The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA’s Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).”

Response #1: The Draft Programmatic EIS outlines and discusses the Proposed Action’s relationship to Flood Hazard Zones – refer to Section 4.4.2 Flood and Tsunami Hazard.

Comment #2: “The applicant should include water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections.”

Response #2: The EIS process is intended to evaluate and disclose the anticipated environmental impacts of the Proposed Action. Pursuant to this effort, the Board of Water Supply has been consulted to ascertain the availability of water service to cover the development of the Proposed Action. The scope of the Proposed Action is outlined in the NASED Programmatic Master Plan (PMP) which is appended to the Draft Programmatic EIS as Appendix A-1: Programmatic Master Plan, outlines the program and vision for the Proposed Action. Nonetheless, it should be noted that Project Design is still on-going, and it is anticipated that adjustments will be made to the conceptual designs and site layout presented in this Draft Programmatic EIS and the PMP as design moves forward under the direction of the State and District Developer(s). Specifically, the final design, scale, and layout of both the New Aloha Stadium, as well as the mixed-use development surrounding it will be directed by the State and District Developer(s). It is further acknowledged that projects within State lands requiring water service from the Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

The applicant is required to provide water demands and calculations to the Engineering Division.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
Stacey Jones, Crawford Architects
To: DLNR Agencies:

Div. of Aquatic Resources
Div. of Hunting & Ocean Recreation
Div. of Forestry & Wildlife
Div. of State Parks
Commission on Water Resource Management
Office of Conservation & Coastal Lands
Land Division – Oahu District
Historic Preservation

From: Russell Y. Tsuji, Land Administrator

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed New Aloha Stadium Entertainment District; Halawa Island of Oahu; TMK: (1) 9-9-003:061, and neighboring parcels 055, 070, & 071

Thank you for the opportunity to review and comment on the above subject. The Land Division of the Department of Land and Natural Resources (DLNR) distributed copies of your request to DLNR’s various Divisions for their review and comments.

Enclosed are responses from our a) Engineering Division, b) Commission on Water Resource Management, and c) Land Division – Oahu District on the subject matter. Should you have any questions, please feel free to contact Barbara Lee at (808) 587-0453 or barbara.j.lee@hawaii.gov. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

TO:

Joe Doherty, Planning Manager
John Foster, Executive Director
Steve Blazes, Recreation Director
Kevin Schmitz, Land Division

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed New Aloha Stadium Entertainment District

LOCATION: Halawa, Island of Oahu; TMK: (1) 9-9-003:061, and neighboring parcels 055, 070, & 071

APPLICANT: Wilson Okamoto Corporation on behalf of Department of Accounting and General Services, State of Hawaii

Transmitted for your review and comment is information on the above-referenced project. The notice of availability of the EISPN has been published in OEQC’s official publication, The Environmental Notice (TEN), on September 08, 2019. This issue of the TEN and a link to the Draft SEIS can be found at: http://oqpc2.doh.hawaii.gov/Envirnmental_Notice/2019-09-08-TEN.pdf

Please submit comments by October 04, 2019. 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 Barbara Lee at 587-0453 or email her at barbara.j.lee@hawaii.gov. Thank you.

( ) We have no objections.
( ) We have no comments at this time.
( ) Comments are attached.

Signed: Patti E. Miyashiro

Date: September 12, 2019

Attachments

Print Name: Patti E. Miyashiro

Cc: Central Files

Draft SEIS on file.
10422-01
December 23, 2020

Patti E. Miyashiro
DLNR Land Division
P.O Box 621
Honolulu, HI, 96809

Subject:  Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Ms. Miyashiro:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS) Preparation Notice. We acknowledge that the Department of Land and Natural Resources-Land Division-Oahu District has no comments to offer at this time as outlined in your letter dated October 8, 2019 (LD 1661).

Your letter, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc:  Chris Kinimaka, Department of Accounting and General Services
     Stacey Jones, Crawford Architects
The HIDOE schools currently serving the Project area are Aiea Elementary, Aiea Intermediate, and Aiea High. The Draft Environmental Impact Statement (DEIS) needs to include the anticipated number of residential units to be developed. Also, there should be an explanation of the educational amenity.

The Project is located within the Leeward Oahu School Impact Fee District. Chapter 302A-1606, Hawaii Revised Statutes, require that residential developments with 50 or more units execute an agreement with the HIDOE. The developer is encouraged to meet with the HIDOE as early as possible to execute an Educational Contribution Agreement.

Further comments will be provided during the review of the Draft Environmental Impact Statement.

Thank you for the opportunity to comment. Should you have questions, please contact Robyn Loudermilk, School Lands and Facilities Specialist with the Facilities Development Branch, Planning Section, at 784-5093 or via email at robyn.loudermilk@k12.hi.us.

Respectfully,

Kenneth G. Masden II
Public Works Manager
Planning Section

KGMrII

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Comment: “The HIDOE schools currently serving the Project area are Aiea Elementary, Aiea Intermediate, and Aiea High. The Draft Environmental Impact Statement (DEIS) needs to include the anticipated number of residential units to be developed. Also, there should be an explanation of the educational amenity.

The Project is located within the Leeward Oahu School Impact Fee District. Chapter 302A-1606, Hawaii Revised Statutes, require that residential developments with 50 or more units execute an agreement with the HIDOE. The developer is encouraged to meet with the HIDOE as early as possible to execute an Educational Contribution Agreement.”

Response: We acknowledge that the Proposed Action will be served by the HIDOE’s ‘Aiea Elementary’, ‘Aiea Intermediate’, and ‘Aiea High Schools.

The Proposed Action will provide needed housing options for the growing population in the region. Upon completion and build out, the Proposed Action is anticipated to potentially encompass residential uses that may account for up to 1,800 new homes which will provide much...
The Environmental Notice

needed housing inventory for residents seeking to live closer to town as well as those in the market for competitively priced housing.

It is also recognized that the Project Site is located within HIDOE’s Leeward O‘ahu School Impact Fee District, and that Chapter 302A-1606 of the Hawai‘i Revised Statutes (HRS) mandates that residential developments with 50 or more units must execute an agreement (Educational Contribution Agreement) with the HIDOE. This requirement will be woven into District Procurement. Pursuant to selection of District Developer(s), the NASED will comply with applicable Federal, State, and City permitting and regulatory requirements. Consequently, it is anticipated that the State and selected District Developer(s) will be consulting directly with HIDOE to verify and adhere to statutory educational contribution requirements.

Your email, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. It is anticipated the Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
Mr. Keola Cheng  
Associate Director of Planning  
Wilson Okamoto Corporation  
1907 South Beretania Street  
Honolulu, Hawaii 96826  

Dear Mr. Cheng:

Subject: New Aloha Stadium Entertainment District  
Environmental Impact Statement Preparation Notice (EISPBN)  
Halawa, Oahu, Hawaii  
TMK: (1) 9-9-003:061, 055, 070, 071  

The Department of Transportation (DOT) understands the Department of Accounting and General Services is proposing the development of a new stadium facility (to replace the existing stadium) and other related ancillary facilities to create an Aloha Stadium Entertainment District (Stadium District) on the approximately 98 acres of the existing stadium site and certain adjacent parcels. The project envisions a down-sized stadium, from 50,000 seats to approximately 35,000 seats. The new stadium complex would include facilities to accommodate related and new events.

Three options for development of the stadium district were provided in the EISPBN. It was stated that the development of the stadium district would occur over time until eventually full buildout was reached.

DOT’s comments on the subject project are as follows:

Airports Division (DOT-AIR)

1. The stadium district is 2.37 miles from the property boundary of the Daniel K. Inouye International Airport (HNL). All projects within five miles from Hawaii State airports must read the Technical Assistance Memorandum (TAM) for guidance with development and activities that may require further review and permits. The TAM is available at the following link:  

2. The stadium district is 17,834 feet from the end of Runway 8L. The Federal Aviation Administration (FAA) regulation requires the submittal of FAA Form 7460-1 Notice of Proposed Construction or alteration pursuant to the Code of Federal Regulations, Title 14, Part 77.9 if the construction or alteration is within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet. Construction equipment and staging area heights, including heights of temporary construction cranes need to be included in the submittal. The form and criteria for submittal are available at the following website: https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

3. Photovoltaic (PV) systems located in or near the approach path of aircrafts into HNL can create a hazardous condition for pilots because of possible glint and glare reflected from the PV array. If glint or glare from the PV array creates a hazardous condition for pilots, the owner of the PV system shall immediately mitigate the hazard upon notification by DOT-AIR and/or FAA.

4. PV systems have been known to emit radio frequency interference (RFI) to aviation-dedicated radio signals, disrupting the reliability of air-to-ground communications. Again, the owner of the PV system shall immediately mitigate the RFI hazard upon notification by DOT-AIR and/or FAA.

Highways Division (DOT-HWY)

A visual review of the conceptual options A, B, and C indicated that the stadium district will largely, but not always, retain the current accesses of the existing Aloha Stadium. Major differences between the options included different locations of the new stadium within the stadium district.

1. It is assumed that each option will have a traffic impact analysis regarding the pros and cons of each option to facilitate the selection process for a preferred option. The analysis is expected to be of a more general nature, suitable for assisting in the selection of a preferred option. DOT-HWY will provide comments on the options analysis as it feels appropriate.

2. DOT-HWY may require that a more detailed Traffic Impact Analysis Report be prepared once a preferred option selection is made, to more specifically analyze the option’s effects to State highways and recommend improvements as may be applicable.

If there are any questions, please contact Mr. Blayne Nikaido of the DOT Statewide Transportation Planning Office at (808) 831-7979 or via email at blayne.h.nikaido@hawaii.gov.

Sincerely,

JADE T. BUTAY  
Director of Transportation
development surrounding it will be determined by that District Developer. The District Developer will also be responsible for complying with all TAM requirements. The TAM requirement will be included in the list of potentially required permits and approvals. (refer to the section of the DPEIS where required permits and approvals will be listed).

Comment #2: “The stadium district is 17,834 feet from the end of Runway 8L. The Federal Aviation Administration (FAA) regulation requires the submittal of FAA Form 7460-1 Notice of Proposed Construction or alteration pursuant to the Code of Federal Regulations, Title 14, Part 77. If the construction or alteration is within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet. Construction equipment and staging area heights, including heights of temporary construction cranes need to be included in the submittal. The form and criteria for submittal are available at the following website: https://oeaaa.faa.gov/oeaaa/external/portal.jsp.”

Response #2: As previously discussed, the final design, scale, and layout of both the New Aloha Stadium, as well as the ancillary development surrounding it will be determined by the selected District Developer. The selected District Developer will also be responsible for complying with all FAA requirements, including those applicable to construction equipment such as cranes. The FAA Form 7460-1 Notice of Proposed Construction or Alteration will be included in the list of potentially required permits and approvals. (refer to the section of the DPEIS where required permits and approvals will be listed).

Comment #3: “Photovoltaic (PV) systems located in or near the approach path of aircrafts into HNL can create a hazardous condition for pilots because of possible glint and glare reflected from the PV array. If glint or glare from the PV array creates a hazardous condition for pilots, the owner of the PV system shall immediately mitigate the hazard upon notification by DOT-AIR and/or FAA.”

“PV systems have been known to emit radio frequency interference (RFI) to aviation-dedicated radio signals, disrupting the reliability of air-to-ground communications. Again, the owner of the PV system shall immediately mitigate the RFI hazard upon notification by DOT-AIR and/or FAA.”

Response #3: It is not anticipated that PV Systems installed onsite would adversely impact Airport Operations. Glint and glare produced by the PV systems will be mitigated through adherence to design and best management practices (BMPs). Should any larger scale PV Systems be considered for installation, the preparation of a glint and glare study will be required prior to authorization of construction.

With regard, to the relationship between PV systems and radio frequency interference (RFI), no adverse impacts on airport operations are anticipated from the implementation of the Proposed Action. The scope and scale of onsite PV systems would not be anticipated to produce a significant level of electromagnetic interference.
As previously discussed, the final design, scale, and layout of both the New Aloha Stadium, as well as the ancillary development surrounding it will be determined by the selected District Developer. The selected District Developer will also be responsible for complying with all mandated regulations and permits in relation to the installation of PV systems.

**Highways Division (DOT-HWY)**

**Comment #1:** “It is assumed that each option will have a traffic impact analysis regarding the pros and cons of each option to facilitate the selection process for a preferred option. The analysis is expected to be of a more general nature, suitable for assisting in the selection of a preferred option. DOT-HWY will provide comments on the options analysis as it feels appropriate.”

**Response #1:** The purpose of the Draft Programmatic EIS process is to evaluate and disclose the anticipated environmental impacts of the Proposed Action. The NASED Programmatic Master Plan (PMP), appended to the Draft Programmatic EIS as Appendix A-1: Programmatic Master Plan, outlines the program and vision for the Proposed Action. The rationale for preparing a PMP and a Programmatic EIS is to accommodate future design changes and refinements by the yet-to-be selected Public-Private-Partnership (P3) developer. Specifically, the final design, scale, and layout of both the New Aloha Stadium, as well as the ancillary development surrounding it will be determined by that P3 developer.

Therefore, pursuant to the scope of the Draft Programmatic EIS process, both existing and anticipated future traffic conditions based on the NASED PMP have been evaluated. A summary of these findings, along with a full Traffic Impact Analysis Report (TIAR) are included within the Draft Programmatic EIS. Any significant deviation from the program evaluated may require subsequent re-evaluation as determined in consultation with agencies administering transportation facilities. If traffic or other environmental impacts are significantly more adverse than presented in the Final Programmatic EIS, a supplemental EIS may be required.

**Comment #2:** “DOT-HWY may require that a more detailed Traffic Impact Analysis Report be prepared once a preferred option selection is made, to more specifically analyze the option’s effects to State highways and recommend improvements as may be applicable.”

**Response #2:** Your comment is acknowledged. The Draft Programmatic EIS discloses that Programmatic analysis and documentation will likely be required pursuant to final design.

Your email, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with

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it, will be available for review on Office of Environmental and Quality Control website following its publication in *The Environmental Notice*.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
Mr. Keola Cheng  
Associate Director of Planning  
Wilson Okamoto Corporation  
1967 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826  

Dear Mr. Cheng:

Subject: Environmental Impact Statement Preparation Notice – Proposed New Aloha Stadium Entertainment District, Halawa, Ewa District, Oahu  
Tax Map Keys: (1) 9-9-003: 661; 9-9-003: 055, 070, and 071

Thank you for the opportunity to provide comments on this Environmental Impact Statement Preparation Notice (EISPAN) for the planning of a new stadium and site redevelopment of the Aloha Stadium.

It is our understanding that the Department of Accounting and General Services (DAGS), in response to conclusions in the February 2017 Aloha Stadium Conceptual Redevelopment Report, proposes the construction of a new stadium facility and related ancillary development on the grounds of the existing Aloha Stadium site in Halawa. The project envisions the creation of a vibrant, mixed-use community anchored by a modern, multipurpose sports and entertainment venue, now branded as the New Aloha Stadium Entertainment District (NASED).

The Draft Environmental Impact Statement (DEIS) is being prepared in conjunction with a master plan being developed to lay the foundation for procurement of a private partner to construct and maintain the new stadium. The master plan for the entire site provides three options for possible location of the new Aloha Stadium, which will be downsized from its existing capacity of 50,000 seats, to a capacity of approximately 35,000 seats. Additional features for NASED will include hotels, retail space, and community recreational space. The EISPAN states that the Phase 1 will comprise the construction of the new stadium and additional mixed-use elements.

The Office of Planning (OP) has reviewed the EISPAN and has the following comments to offer.

Transit-Oriented Development

1. NASED is one of the priority TOD projects identified by the Hawaii Interagency Council for Transit-Oriented Development in its State of Hawaii Strategic Plan for Transit Oriented Development: Revised August 2018. The DEIS should consider the TOD Strategic Plan and other State TOD projects in the area when evaluating the proposed project and its impacts. The TOD Strategic Plan can be found at: https://planning.hawaii.gov/wp-content/uploads/State-TOD-Strategic-Plan_Dec-2017-Rev-Aug-2018.pdf.

2. It is important that the NASED project be evaluated and planned in terms of its physical and functional relationship to an adjacent priority TOD project identified in the TOD Strategic Plan – the redevelopment of the Hawaii Public Housing Authority’s (HPHA) Puuwaik Momi project, situated on Tax Map Key (1) 9-9-003: 056. HPHA envisions increasing the project unit count to 1,500 units. As the HPHA is not currently listed as an agency under “Consultation” on page 8 of the EISPAN, OP recommends consultation with HPHA to ensure that optimal TOD benefits are derived from the co-location of these projects in this area.

3. The NASED DEIS should analyze and discuss the cumulative impacts of the NASED development and additional housing units—those planned for Puuwaik Momi and other nearby parcels—on roadway and infrastructure systems serving this area, as well as identify measures that are planned or proposed to mitigate or avoid short- and long-term impacts on these infrastructure facilities.

4. The DEIS should define the timing of Phase 1 and the approximate extent of the area to be developed under Phase 1 and identify the infrastructure improvements that will be required for the first phase and subsequent phasing. The DEIS should discuss where bundling of improvements needed for subsequent phases in Phase 1 delivery might be advantageous to avoid having to dig up streets or finished improvements in later phases.

5. The EISPAN states “the proposed project will not result in development at the Halawa/Aloha Stadium HART station,” while the options being proposed under the master plan clearly show development on that parcel. TOD is most successful when access to stations or the stations themselves are physically integrated with adjoining buildings or facilities. This option should not be foreclosed on for the future, and any potential impacts of such integration should be noted. On a related note, the DEIS should examine the need for a multimodal mobility center in proximity to the rail station or within the NASED that would enhance the user experience in travelling to, from, and within the district.
6. The DEIS will need to discuss the regional wastewater system capacity and planned City and County of Honolulu (City) improvement projects as it impacts Phase 1 and subsequent phases of buildout. The DEIS should identify options being considered to meet the wastewater collection and treatment demand should City system capacity not be available when needed.

7. Traffic, parking, and noise impacts on adjoining neighborhoods have been raised as concerns. The DEIS should discuss what measures can or will be taken to manage traffic volume and flow, parking, and promote greater connectivity within the NASED that provides safe pedestrian and bicycle access to the rail station and within NASED. It would be useful for the DEIS to examine and discuss a range of noise attenuation strategies that could be considered in facility and site design, building materials, landscaping, and event management.

8. The DEIS should discuss the energy efficiency and renewable energy technologies that will be used in meeting the increased energy demand that would be generated by NASED development.

9. The DEIS should also identify whether there are any environmental hazards on the property from contamination onsite or offsite that would need to be remediated or removed prior to development. If remediation or removal is required, the DEIS should identify the extent of the response required and who will be the responsible parties for the response action.

10. The DEIS should discuss the need for State TOD Development Plan Approval by the OP. Pursuant to § 225M-2(b)(10)(h), the OP shall “approve all state agencies’ development plans for parcels along the rail transit corridor.” For purposes of this requirement, “Development plans” mean conceptual land use plans that identify the location and planned uses within a defined area. OP’s review and endorsement of these development plans focuses on their consistency with county-adopted TOD or development plans that set forth TOD strategies, as well as the Smart Growth and TOD principles of compact, mixed-use, transit-linked, walkable, and pedestrian. OP’s approval of development plans is undertaken in the course of its review of environmental assessments and EIAs prepared pursuant to Chapter 343, HRS.

11. In addition, the State TOD Planning and Implementation Project, currently underway and managed by OP, has developed an anticipated land use scenario and identified regional and project-serving infrastructure needs for TOD buildout in the Honolulu-Stadium TOD Priority Area. The purpose of the project is to provide information on infrastructure project requirements, costs, and timing to help formulate an infrastructure investment strategy for the State that would support TOD on State lands. The land use scenario and the infrastructure needs assessment have been developed in consultation with State agencies, including DAGS and the Stadium Authority. A brief description of this project should be provided in the DEIS. If possible, it would be valuable to identify where the infrastructure assumptions, improvement requirements, costs, and timing developed for the NASED DEIS differ significantly from those compiled under the State TOD Implementation Project, so that adjustments may be made, or differences reconciled as needed in formulating recommendations for a broader State infrastructure investment strategy for the region.

12. Drainage/Stormwater Runoff Controls/Low Impact Development (LID)
Section 1.2, page 2 of the EIS/PN lists resource categories such as Geology, Topography, Soils, and Surface and Coastal Waters that will be evaluated in the DEIS. Based on the project area’s size, and its proximity to Ala Moana, this redevelopment project may be subject to the City and County of Honolulu, Department of Planning and Permitting (DPP) rules on drainage and onsite stormwater management. Please indicate any LID post-construction standards as they would apply to this project.

To assist in the development of onsite stormwater management plans, and the resource categories listed above, OP has developed guidance documents on this subject. We recommend consulting these evaluation tools when developing mitigation methods to offset polluted storm runoff. These documents offer useful techniques to keep land based pollutants and sediment in place, while considering the management practices best suited for the topography of the area and the types of contaminants potentially affecting nearby water resources. These useful stormwater evaluation tools include:

- **Stormwater Impact Assessments** assist in identifying and evaluating information on hydrology, stressors, sensitivity of aquatic and riparian resources, and management measures to control runoff, as well as consider secondary and cumulative impacts to the area:

- **Low Impact Development (LID), A Practitioners Guide** covers a range of structural best management practices for stormwater control management and layout that minimize environmental impacts:
13. Hawaii Coastal Zone Management (CZM) Program
The DEIS will need to evaluate the relationship of the proposed action with the objectives and supporting policies of the Hawaii CZM Program, listed in HRS § 205A-2, as amended. This analysis should include the project's compatibility with all ten of the components of HRS § 205A-2. If the project conflicts with any of the provisions of HRS § 205A-2, the DEIS should indicate what steps will be taken to align the project with these objectives and supporting policies. Compliance with HRS § 205A-2 is a vital component for satisfying the requirements of HRS Chapter 343.

14. Hawaii State Planning Act
The DEIS will also need to assess the relationship of the proposed action with the Hawaii State Planning Act, as found in HRS Chapter 226. This assessment should detail the proposed project's relevance with all parts of HRS Chapter 226, the Hawaii State Planning Act; which include Part I - the goals, objectives, and policies; Part II - planning coordination and implementation (State Functional Plans); and Part III - priority guidelines. The DEIS should discuss those policy elements that would be negatively impacted by the proposed project and the measures that will be taken to mitigate negative impacts.

If you have any questions regarding these comments, please contact Ruby Edwards, Land Use Division, (808) 587-2817, or Joshua Heckel, CZM Program, (808) 587-2845.

Mahalo,
Mary Alice Evans
director

Cc: Christine I. Kinimuka, Department of Accounting and General Services
Scott Chun, Stadium Authority
Andrea Los Banos, Hawaii Community Development Authority

10422-01
December 23, 2020
Mary Alice Evans
Director, Office of Planning
235 South Beretania St, 9th Floor
Honolulu, HI, 96813

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Ms. Evans:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). Preparation Notice with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 2001, Section 24.

We offer the following in response to your comments outlined in your letter dated November 6, 2019 (DTS201909161341ED) in relation to the scope and content of the Draft Programmatic EIS:

1. The Proposed Action, when considered in conjunction with past, present and reasonably foreseeable future actions to the environment, may result in cumulative impacts. Section 4.18.1 (Known Conceptual and Underway Development Projects) of this EIS provides a summary of known conceptual and underway development within proximity of the Project Site. A review of potential cumulative and secondary impacts of the Proposed Action and other development is also provided. These developments include the following:
   - Live Work Play ‘Aiea;
   - ‘Aiea-Pearl City Neighborhood TOD Plan;
   - Hālawa Area TOD Plan;
   - ‘O‘ahu Community Correctional Center (OCCC);
   - Pu‘uwai Moi Development;
   - Honolulu / Waipahu / Pearl City Wastewater Conveyance Facilities; and
   - Other Potential Developments

2. The scope of your comments is acknowledged, they will be incorporated into the forthcoming Draft Programmatic EIS.

3. Proposed Action residential products will provide prospective residents with a wide range of housing choices. Upon completion and build out, the Proposed Action is anticipated to include up to 1,800 new homes which will provide much needed housing inventory for residents seeking to live closer to town as well as those in the market for competitively priced housing.
An analysis of the current housing conditions and the proposed actions anticipated impacts is provided in Chapter 4, Section 13.2.1 Population and Housing of the Draft EIS. Additionally, within DEIS Appendix A-1, Programmatic Master Plan (PMP), a variety of housing options are addressed under Chapter 2.6 Equity and Inclusion, under subsection Residential and Housing Diversity.

4. An overview of project phasing and implementation is included within the NASED PMP.

5. The scope of your comments is acknowledged. Multimodal transportation strategies are further discussed within the Programmatic Mater Plan Chapter 3.6 Public Transist, included as Appendix A-1 of the Draft Programmatic EIS.

6. A Preliminary Engineering Report (PER) prepared by Wilson Okamoto Corporation serves as a basis for the EIS evaluation of the Project Site and regional infrastructure and utilities under the context of the Proposed Action. The Draft Programmatic EIS includes the PER as Appendix J Preliminary Engineering Report.

7. The Proposed Action will seek to improve accessibility, connectivity, and mobility within the Project Site and surrounding community by creating a network of pedestrian walkways, bike paths, developing safer routes for mass transit and ride sharing options, and improvement made to major arterials that service the area. The Proposed Action will create multi-modal streets and paths that enhance the sense of place and accessibility of the surrounding community.

Existing conditions and the anticipated impacts of the Proposed Action are addressed in the subject Draft EIS. Information relating to traffic is addressed in Chapter 4, Section 11 Traffic, which summarizes the findings and analysis conducted under a formal traffic study, which is appended to the Draft EIS as Appendix H Traffic Impact Assessment.

8. The scope of your comments is acknowledged, it is anticipated the implementation of energy efficient designs and renewable energy technologies will be pursued for incorporation to the project at the direction of the selected District Developer.

9. A hazardous materials remediation plan will be prepared and implemented by the selected P3 developer(s) prior to development of the District. Known hazardous materials will be contained or remediated to a level acceptable for the future planned uses. However, it is possible that additional future development at the proposed stadium site may require additional remediation measures. Such measures are difficult to quantify or estimate at this time, as they are tied specifically to the Proposed Action’s design, demolition, and site preparation efforts which, at this early stage of project planning and programming, are unknown.

The Draft EIS provides an assessment of the existing conditions and anticipated impacts of the proposed action relating to Hazardous materials in Chapter 4, Section 10 Hazardous Materials. The EIS also included a detailed report prepared by ENPRO environmental dated March 4th, 2020 appended as Appendix G: Hazardous Materials Survey.

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

The Draft EIS also provides and assessment of the existing conditions and anticipated impacts of the Proposed Action associated with surface waters in Chapter 4, Section 3.1 Surface Water. Subsequently AECOS has prepared a Natural Resource Assessment that includes an in depth study of the Hālawa Stream. AECOS Natural Resources Assessment has been appended to the Draft EIS as Appendix C: Natural Resources Assessment- NASED.

10. The Proposed Action will require permits and approvals for various agencies prior to the construction and operation of the proposed NASED. A list of required Permits and Approvals is further discussed in Section 5.3 Permits and Approvals of the Draft Programmatic EIS.

11. Your comment is acknowledged, “Land Uses” are discussed as an environmental resource criteria within the subject Draft Programmatic EIS.

12. The Proposed Action’s relationship to of the list of resources that include Geology, Topography, Soils, Surface Water and Coastal Waters and evaluated in the Draft Programmatic EIS — refer to Chapter 4 Description of Existing Environment, Impacts and Mitigation Measures of this Draft Programmatic EIS.

13. The Proposed Action’s alignment with and relationship to the objectives and supporting polices of the Hawaii Coastal Zone Management is discussed and evaluated in the Draft Programmatic EIS — refer to Section 5.1.3 Hawaii Coastal Zone Management Program.

14. The Proposed Action’s alignment with and relationship to the objectives and supporting polices of the State Functional Plan is discussed and evaluated in the Draft Programmatic EIS — refer to Section State Functional Plans.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.
Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
All,

Apologize for the delay in getting this response to you. Navy comments to the State of Hawaii/Aloha Stadium Entertainment District are attached. The Navy would like to remain engaged as this initiative progresses. We look forward to continuing to work together on this initiative. Please let me know if anyone has any questions.

John Muraoka
NAVFAC HI in Support of
NRH REC and Environmental Compliance
Code EV13
Bldg X-11, Ph: 471-4850
e-mail: john.muraoka@navy.mil

1/1
10422-01
December 23, 2020

John Muraoka
Naval Facilities Engineering Command (NAVFAC)
U.S Navy-Department of Defense
John.muraoka@navy.mil

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hilawa, Oahu, Hawai‘i

Dear Mr. Muraoka:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i’s Administrative Rules, Title 11, Chapter 200.1, Section 24.

We offer the following in response to your comments relating to the scope and content of the Draft Programmatic EIS:

The adjacent Joint Base Pearl Harbor Hickman (JBPHH) military installation is one of the Navy’s busiest harbors and is considered a critical strategic component of the nation’s defense network and operations. Securing the line of sight and visibility of on-base operation is a chief concern. Pursuant to the initial early scoping effort associated with the subject EIS process, the Navy has expressed that it is imperative that the Proposed Action not compromise national security or the physical security of the adjacent JBPHH. The State and selected District Developer(s) will consult with the Navy, as appropriate to ensure that final design and implementation of the Proposed Action will not present a National Security risk, nor adversely impair the physical security of the JBPHH installation.

The Proposed Action will seek to improve accessibility, connectivity, and mobility within the Project Site and surrounding community by creating a network of pedestrian walkways, bike paths, developing safer routes for mass transit and ride sharing options, and improvement made to major arteries that service the area. The Proposed Action will create multi-modal streets and paths that enhance the sense of place and accessibility of the surrounding community.

Existing conditions and the anticipated impacts of the Proposed Action are addressed in the Draft Programmatic EIS. Information relating to traffic is addressed in Chapter 4, Section 11
Traffic, which summarizes the findings and analysis conducted under a formal traffic study, which is appended to the Draft Programmatic EIS as Appendix H Traffic Impact Assessment.

Your email, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
TWIMC
I request that the EIS include an economic evaluation of impacts to our state debt and a fair analysis of funding priorities statewide.

Maui has been waiting a long time for much needed infrastructure upgrades and even basic repairs for schools and infrastructure. I’d like to see an evaluation of the needs and benefits of a new stadium vs the needs and benefits of outer island infrastructure.

Thank you,
Patti Cadiz
2406 Waipua Street
Paia, HI 96779
Sent from my iPhone

Patti Cadiz
2406 Waipua Street
Paia, HI 96779
Sent from my iPhone

Subject: Environmental Impact Statement Preparation Notice: New Aloha Stadium Entertainment District (NASED)
Hilawa, Oahu, Hawai‘i

Dear Ms. Cadiz:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
Stacey Jones, Crawford Architects
November 7, 2019

Agency
Chris Kinimaka
Department of Accounting and General Services
1151 Punchbowl St
Honolulu, HI 96813

Copy to Applicant
Keola Chang
Wilson Okamoto Corporation
1907 S. Beretania St.
Honolulu, HI 96826

RE: Response to the EISP/N for the New Aloha Stadium Entertainment District (NASED)

Dear Ms. Kinimaka,

UNITE HERE Local 5 is the labor union that represents most hotel workers in Waikiki, as well as other hotel, food service and health care workers across the state. We believe that issues affecting the working class are not only related to our jobs, but span into our personal lives as well. It is in this capacity that we respectfully submit our testimony for the New Aloha Stadium Entertainment District EISP/N.

Our primary concern is that local needs—particularly around affordable housing—are insufficiently represented in the potential development for this site. Multiple recent studies identify affordable housing as one of the foremost issues for Kama‘aina. In 2015, a national survey found that homelessness and housing ranked as the second and third most important issues to residents of Hawaii.1 In 2016, that same poll found those issues rose to first and second, respectively.2 A 2017 statewide survey from the Hawaii Association of Realtors found that 85% of residents feel significant concern over the lack of affordable housing.3 In the 2019 Hawaii Perspectives Poll, 45% of voters live in a household with someone considering moving away.4 Just as Local 5 has a responsibility to its members, the City and County of Honolulu has a responsibility to its residents and their needs.

Local 5 was one of the few organizations represented at both the Community Scoping Meeting and the WT Partnership’s P3 Industry Day. At the Community Scoping Meeting, community members made clear that affordable housing, traffic, desire for more community usage, and retaining the swap meet were among their top concerns for the Aloha Stadium redevelopment.

Yet when developers, financiers, architects, general contractors, and engineers gathered to discuss the same redevelopment at the P3 Industry Day, there was little mention of any of the community’s concerns from either the State or the private sector. We find this very concerning, especially given the opportunity that this large-scale public project affords to address these concerns.

Minimally, the Draft EIS should include analysis of the following:

1. Study of the feasibility of building a hotel as part of this redevelopment project. This should include comparative discussion about various levels of service at which such a hotel could operate, the ideal size of such a hotel, the amenities such a hotel would have, and how each of the foregoing would impact the number, type and quality of jobs at such a hotel.

2. Please explain all processes for the community and/or the Honolulu City Council to input or discretion over the Stadium project and its component pieces. Please explain the timeline for such input or discretion.

3. Please provide a timeline for the project that includes when demolition will take place, when construction of each component will take place, when each component will become operational or obtain a certificate of occupancy, and when each component of the project will be complete.

4. Several projects on our islands have completed Environmental Impact Statements or Environmental Assessments years before construction commences, and in some cases decades before the projects are complete. The environment, including each of the aspects that an Environmental Impact Statement is supposed to address, can change significantly during that time—traffic, socioeconomics, population, availability of utilities, endangered and native flora and fauna, etc. Please discuss how this project and any components of this project not completed in five years will address and mitigate the project’s changing impacts as the surrounding environment changes.

5. Please include analysis of the impacts of all other known and/or proposed developments which are either in the area or large in scale which could affect or be affected by this project. Among other things, this would include the Aina Live Work Play project, potential redevelopment of the Neal Blaisdell Center, Ho‘opili, Koa Ridge, Hoakalei Resort at Ocean Pointe, and other large sports complexes and concert venues on Oahu.

6. Please include analysis of ways this project could incorporate large-scale affordable housing projects at different affordability levels, and the impact the project would have
on the statewide need for affordable housing under each alternative (including any alternatives which do not consider large-scale affordable housing components).

7. Please describe all forms of public subsidies, tax incentives, tax breaks, public financing, and other public monies that will be: a) available to developers of the various components of this project, and b) used for any part of this project at any stage.

8. Please provide a valuation of each of the the assets and contracts that will be awarded to private partners for this project.

Mahalo,

Abby Snyder
UNITE HERE! Local 5
1516 South King St.
Honolulu, HI 96826
808-941-2141 ext. 238
asnyder@5.unitehere.org

10422-01
December 23, 2020

Abby Snyder
Local 5
1516 South King St.
Honolulu, HI, 96826
asnyder@5.unitehere.org

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Ms. Snyder:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i’s Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning
cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects

1 https://www.civilbeat.org/2015/03/what-are-the-top-five-issues-in-hawaii/
2 http://www.hawaiirexpress.com/ArticlesMain/tabid/266/0217421/CC-Roll-Call-Top-5-Issues-in-Hawaii.aspx
November 7, 2019

Mr. Keola Cheng, Planning Consultant
Wilson Okamoto Corporation
Honolulu, Hawaii 96826

Ms. Christine L. Kimimuka, Public Works Administrator
Department of Accounting and General Services
State of Hawai‘i 96818

Re: Aloha Stadium Entertainment District EIS

Thank you for this opportunity to give input on this exciting and sensitive new project. We hope our input can manifest itself into a meaningful redevelopment for our community. This redevelopment does not happen in isolation, it will impact our four vital transportation corridors of Salt Lake Boulevard, Kamehameha Highway, Moanalua Road and the H-1 freeway.

Currently the present Aloha Stadium is a standalone structure surrounded by parking spaces, that usually prove to be inadequate in number. Depending on the event, it is not unusual to have event goers parking spill over into the surrounding neighborhoods. You will hear over and over, the most critical concern from the surrounding community is the increase density with uses such as small businesses and “hotel” in the proposed plans. This increase in density will adversely impact parking spaces and emphasize the shortages in our neighborhood. As the circle around the redevelopment enlarged, traffic congestion issues on our above four (4) arteries will impact our community’s ability to navigate home or to the Leeward plains.

Currently the Aloha Stadium occupies a large area with a large parking mass. The stadium is used mostly on the weekends and the proposed redevelopment would mean a daily use of the property. Less parking spaces to accommodate those users and more traffic flow in and out of the neighborhood. Certainly, the rail station at Hālawa will provide some relief for commuters and end destination users but there is no parking attached to that rail station. Although, we have reservations to blocking our view planes to Pearl Harbor a palatable low rise parking structure must be considered. Supplemental mass transit integration is a necessity to reduce congestion and improve accessibility to any new development. Attention also must be given to exiting the area heading west without going through ‘Aiea town or doubling back to Honolulu and then west.

P. O. Box 2785 • ‘Aiea, Hawaii • 96701
November 7, 2019

Mr. Keola Cheng, Planning Consultant
Wilson Okamoto Corporation
Honolulu, Hawai‘i 96826

Ms. Christine L. Kinimaka, Public Works Administrator
Department of Accounting and General Services
State of Hawai‘i 96818

Re: Aloha Stadium Entertainment District EIS

Thank you for this opportunity to give input on this exciting and sensitive new project. We hope our input can manifest itself into a meaningful redevelopment for our community. This redevelopment does not happen in isolation, it will impact our four vital transportation corridors of Salt Lake Boulevard, Kamahameha Highway, Mountain Road and the H-1 freeway.

Currently the present Aloha Stadium is a standalone structure surrounded by parking spaces, that usually prove to be inadequate in number. Depending on the event, it is not unusual to have event goers parking spill over into the surrounding neighborhoods. You will hear over and over, the most critical concern from the surrounding community is the increase density with uses such as small businesses and “hotel” in the proposed plans. This increase in density will adversely impact parking spaces and emphasize the shortages in our neighborhood. As the circle around the redevelopment enlarges, traffic congestion issues on our above four (4) arteries will impact our community’s ability to navigate home or to the Leeward plains. Currently the Aloha Stadium occupies a large area with a large parking mass. The stadium is used mostly on the weekends and the proposed redevelopment uses would mean a daily use of the property. Less parking spaces to accommodate these users and more traffic flow in and out of the neighborhood. Certainly, the rail station at Hālawa will provide some relief for commuters and end destination users but there is no parking attached to that rail station. Although, we have reservations to blocking our view planes to Pearl Harbor a palatable low rise parking structure must be considered. Supplemental mass transit integration is a necessity to reduce congestion and improve accessibility to any new development. Attention also must be given to exiting the area heading west without going through ‘Ali‘i Road or doubling back to Honolulu and then west.

“Aloha Stadium Entertainment District - EIS Comments

and get some hand-on interactive experiences would be so beneficial for our keiki. Working together with University cultural practitioners to develop these “miniature” Bishop Museums would be welcomed by kama‘aina and malihinis.

Careful thought must be given to the hotel feature. It will add tremendous density. If the hotel’s purpose is to service the venue of the Aloha Stadium Entertainment District, it can be smaller in height, limited car access, promote bus drop off and pickup and rail transit accessible.

At the public hearing, there were many who testified in favor of affordable housing, some even suggesting such dense housing as the Singapore’s answer of seven towers of 50’ heights. The ‘Aiea Community Association recognizes the need for affordable housing but we will strongly oppose have such dense housing or use of the Aloha Stadium redevelopment as an answer for O‘ahu’s housing shortage. We do not feel the community’s best interests will be served using this prime, central and open space as housing. We do not want to be another plopped down Waialua or a densely populated Kakaako area. Those of us, who are five long residents of ‘Aiea, bought the suburbs and we would like to have some semblance of it preserved.

We look forward to continued community opportunities for input and review. Thank you very much for including us in this process. Our community is cautiously excited and optimistic about the Aloha Stadium Redevelopment and the opportunities it presents to us. We would like to see innovative and futuristic uses for this precious ‘Ali‘i that will not compromise the values and negatively impact our quality of life.

Mahalo,

Claire Tamamoto
‘Aiea Community

P.O. Box 2785 • ‘Aiea, Hawai‘i • 96701

"Building A Sense of Community"
10422-01
December 23, 2020

Claire Tamamoto
Aiea Community Association
P.O. Box 2785, †Aiea, HI 96701
aieacommunity@gmail.com

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hilalwa, Oahu, Hawai‘i

Dear Ms. Tamamoto:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS).
We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
Aloha,

I strongly believe the New Aloha Stadium Entertainment District should include much more than 2,000 housing units. Since the redevelopment takes place on 98 acres of state-owned property, and has access to its own rail station, this is an ample opportunity for the state to develop a mass amount of affordable housing units (80% AMI or below) and to aid Oahu’s critical housing crisis. Please consider revising this proposal to include 5,000 housing units to meet the needs of the area’s growing population.

Peace,

Amy

Rev. Amy C. Wake, Senior Pastor
Trinity United Methodist Church
1716 Komo Mai Dr
Pearl City, HI 96782
I feel very strongly that the New Aloha Stadium Entertainment District is an opportunity to create many more than the planned 2,000 housing units. With access to rail on 98 acres of state-owned property, this is a perfect opportunity for the state to aid Oahu’s critical housing crisis by developing a mass amount of affordable housing units. The EIS should quantify the impact on the state's published housing demand.

Thank you,
Carla S. Allison
1062 Oiliopu Place
Honolulu, HI 96825

---

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Ms. Allison:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
From: David Kimo Frankel <davidkimofrankel@hawaiiantel.net>
Sent: Friday, September 20, 2019 10:37 AM
To: Public Comment
Subject: EISP

I would like to offer the following comments on the EISP for the New Aloha Stadium Entertainment District.

The EISP assumes that a stadium is needed. One of the primary reasons for a stadium is to host football games. Without the stadium, it would be much more difficult for the University of Hawai‘i and high schools to play football. Therefore, a secondary impact that the EIS must consider is that football causes a significant number of players to suffer the effects of concussions. While I do not expect the EIS to include thorough medical review of the latest science on concussions, it must acknowledge that the project will facilitate concussions. Using commonly accepted statistical analysis, it can even calculate how many individuals are likely to suffer concussions annually a the stadium.

On the flip side, as the science matures and as lawsuits increase, there is a distinct likelihood that in the next few decades, football will not be played in the way it is now at the high school and collegiate level. There is a distinct possibility that high schools and even the University of Hawai‘i will shut down these programs as they grapple with the expense, personal tragedy and societal costs of concussions. If this happens, how often will this new stadium be used?

The EIS should include a graph that shows how attendance at Aloha Stadium has steadily decreased since it was built. While there are many armchair quarterbacks who can provide multiple explanations for the decline, the EIS should acknowledge that in general fewer people want to attend sporting events on O‘ahu. That trend may well continue into the future, even with a new stadium.

Finally, the EIS should explore a fourth option. Instead of creating a structure that encourages residents to sit on their butts for hours, consider installing attractions that allow residents to be participants rather than spectators. Instead of a stadium, you could offer a running path, pickleball courts, volleyball courts, sports fields and a dogpark. And you could include more affordable housing.

David Kimo Frankel
1638-A Mikahala Way
Honolulu, HI 96816

10422-01
December 23, 2020

David Kimo Frankel
1638-A Mikahala Way
Honolulu, HI 96816

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Mr. Frankel:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your email, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review of Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects

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

Joshua Arallon
P.O. Box 37335
Honolulu, HI 96837

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Mr. Arallon:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
Stacey Jones, Crawford Architects
From: Kevin Carney <kevin.carney@eahhousing.org>
Sent: Monday, October 14, 2019 12:44 PM
To: Public Comment
Cc: Kevin Carney
Subject: Aloha Stadium Redevelopment EIS

Follow Up Flag: Follow up
Flag Status: Flagged

Only 2,000 housing units on state land when we have a recognized housing crisis for at least the last 10 years? What a great opportunity to provide ridership for rail in a central part of Oahu! The largest demand for housing is for those making 80% of the Area Median Income and below. At that level of income we are talking about rental housing and renters are most likely to be your rail commuters. So help solve the housing crisis and provide ridership for rail by increasing the number of housing units to 10,000 with a majority of those at 80% AMI and below. Thank you for the opportunity to comment.

Kevin

Kevin R. Carney, (PB), NAHP-E
Vice President, Hawaii
RB-16444
Office: (808) 523-8826 Fax: (808) 523-8827 | kevin.carney@eahhousing.org
wwweahhousing.org | Twitter | Facebook | Youtube
1001 Bishop St., Suite 2280, Honolulu, HI 96813
EAH Housing | HI Lic. RB-16985 | CalBRE Lic. 853495

"The mission of EAH Housing is to expand the range of opportunities for all by developing, managing and promoting quality affordable housing and diverse communities."
Aloha!

I am off-island and unable to attend the Sept. 25th meeting for the Aloha Stadium EIS. I was wondering what considerations will be made regarding a central utility plant for the entire entertainment district?

Mahalo,
Nicole

Nicole A. Velasco
Business Development
NORESCO
3375 Koapaka Street, Ste. F220-26, Honolulu, HI 96819
Cell 808.304.3716  nvelasco@noresco.com
www.noresco.com

Confidentiality Note:
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Attaching my comments.

---

Rev. Samuel L. Domingo
204 Kuuhoa Place
Kailua, Hawaii 96734
Cell Phone: 808-384-8701
Email: revsandom@gmail.com

To the New Aloha Stadium Entertainment District Delivery Team:

I am a retired United Methodist pastor, who has been in ministry here for over 40 years, and one of the two remaining pastors who help create Faith Action for Community Equity in 1993. We are a grassroots, interfaith 501(c)3 non-profit organization driven by a deep spiritual commitment to improving the quality of life for our members and all the people of Hawaii.

Our state and especially the island of Oahu is experiencing a housing crisis. The members of Faith Action continue to be concerned with creating housing for our local residents especially those whose incomes are 80% and below the AMI. We are now interested in pursuing the creation of higher density housing on public lands and that the conversations around the plans for a new stadium ought to include building low cost housing.

I offer my comments on the Environmental Impact Statement.

- Regarding the Purpose and Need:
  I would like the Purpose and Need statement to explicitly include low cost housing (which should be defined as households earning 80% of area median income spending no more than 30% of that income on housing costs) in addition to stadium renovation/replacement, mixed-use development, and transit-oriented development.

- Regarding socioeconomic characteristics:
  The Department of Business, Economic Development and Tourism (DBEDT) issued a March 2015 report stating, “The forecast projects demand for an additional 64,700 to 66,000 housing units, during the 2015-2025 period... Wages and incomes have not been growing as fast as housing prices, making it harder to afford real estate in Hawaii, especially for younger and lower-income households.” The state has clearly indicated the need for more housing units for local residents. Therefore, I believe this EIS should examine affordable housing as a socioeconomic impact of the proposed project. It should quantify the impact on the state’s published housing demand.

- Regarding infrastructure, traffic, and utilities:
  The EIS should quantify the site’s maximum housing capacity (given as housing units, gross floor area, and building height). The EIS should also examine the impact of raising the maximum housing capacity of the site by constructing additional capacity or preserving space for utilities.

- Regarding public services and facilities:
  Given the March 2015 DBEDT report quantifying the need for housing units, I believe the EIS should quantify the project’s impact to public land as an opportunity cost by decreasing the developable state land area. The analysis should include a declaration of the highest and best use of the land proximate to the future rail station in the context of the Halawa Area Transit-Oriented Development Plan. This plan must “Preserve existing affordable housing and potential opportunities for new affordable housing, and as appropriate, with supportive services.” If the plan does not include the physical maximum quantity of affordable housing units, the EIS should quantify the land area...
that could be preserved as undeveloped parcels for the future implementation of low cost housing within the site. The State Legislature is considering a bill proposing development of high-density affordable housing on state-owned land, therefore the EIS should quantify the impact to available state land for high-density affordable housing, particularly on the rail corridor.

- **Regarding air quality:**
  The EIS should examine the relationship between housing units and air quality. A sensitivity analysis should be included reducing and/or eliminating parking spaces for exclusive residential use. The most aggressive analysis should examine the effects of 100% low cost housing units for transit-dependent residents who would not keep motor vehicles on site. Another air quality sensitivity analysis should assume all Swap Meet vendors and Entertainment District employees have on-site housing units that are low cost (at 30% of their income) and dedicated for their living so they can live within walking distance of their places of business.

- **Regarding infrastructure, traffic, and utilities:**
  The EIS should examine the relationship between increased housing units and motor vehicle traffic congestion. A sensitivity analysis should also be included to reducing and/or eliminating parking spaces for exclusive residential use. The most aggressive analysis should examine the effects of 100% low cost housing units for transit-dependent residents who would not keep personal vehicles on and near the site. Another traffic sensitivity analysis should assume all Swap Meet vendors and Entertainment District employees have on-site housing units that are low cost (at 30% of their income) and dedicated for their living so they can live within walking distance of their places of business.

---

**Wilson Okamoto Corporation**

10422-01
December 23, 2020

Rev. Samuel L. Domingo
204 Kuuhoa Pl
Kailua, HI, 96734
reysamdom@gmail.com

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hilawau, Oahu, Hawai’i

Dear Rev. Domingo:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai’i Administrative Rules, Title 11, Chapter 2001.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
Subject: EISPN: Proposed New Aloha Stadium Entertainment
District (NASED) — Scoping Meeting, September 25, 2019

Please address:

1) Noise + vibration containment — Dome vs. open air
2) Car-centric — Pedestrian, bike-friendly
3) Traffic control — Accommodate neighborhood + local traffic
4) Nature of the family-focused neighborhood + affordable housing
   vs. impacting outside investors +
   non-family type of occupants. Do not solicit more "Kukaha
5) Enhancing the life for current residents — Add value to
   the current residents
6) The venue is not just an "entertainment" development site to
   integrate the function into the existing neighborhood where
   people, families, children, when people are working, sports
   enjoy movement
7) Please answer the public emailed comments. I never received reply.
8) Please go green in reduction foot print — Please go green w/gran trees

(Inclue additional sheets as necessary)

Please Print:

Name: Sandra Pak
Phone: 224-5297

Organization:

Mailing Address:

Email: Sandra.Teruya@gmail.com

Please submit comments by November 7, 2019, or email

NASED.FIS@wilsonokamoto.com

*Receipt of e-mailed comments will be confirmed via e-mail. If you do not receive a confirmation message, please contact our office (see contact information, above).
Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Ms. Pak:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS).
We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

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We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
SUBJECT: EISP: PROPOSED NEW ALOHA STADIUM ENTERTAINMENT
DISTRICT (NASED) – SCOOPING MEETING, SEPTEMBER 25, 2019

1) How will building the new complex affect the properties located across the stadium in the Halawa Valley Estates?

2) What methods of construction will be used? Will it affect the foundation of homes across the street in Halawa Valley Estates?

3) Will the current water, gas, electrical and utilities be upgraded to handle the added entertainment / stadium venues?

4) Will construction fences be erected to protect homes in Halawa Valley Estates from dirt, fumes, etc?

NASED Comments
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826
Attention: Mr. Keola Cheng

Postage Required

(include additional sheets as necessary)

PLEASE PRINT: Name: Tina Tamam	Phone: 808-225-0185
Organization:
Mailing Address: 99-290 Ohuana Pl
Arc #1, Aloha
Email: tamam.tina818@gmail.com

Please submit comments by November 7, 2019, or email NASED.EIS@wilsonokamotocom

*Receipt of e-mailed comments will be confirmed via e-mail. If you do not receive a confirmation message, please contact our office (see contact information, above).
Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Ms. Tamaru:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Chang
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
35,000 seat is too small. This will be the only large capacity outdoor facility in Hawaii for the next 50 years. The old 50,000 seat stadium, while not sold out frequently, still fills the stands on occasion. Limiting the new facility to 35,000 seems very short sighted for a once in a generation project.
Dear Members of Crawford Architects,

Thank you for allowing me to offer comments about the new Aloha Stadium Entertainment District. I believe the next stadium, along with UH and Daniel Inouye International Airport, should be the man-made jewels of Oahu.

I had the opportunity to travel to Seattle for the recent UH game and toured Century Link Stadium and attended the football game at Husky Stadium. I would like to see the experience at our next stadium to be similar to those in Seattle. It goes without saying that the stadium planners should visit 3-4 successful stadium venues on the mainland to get some ideas for a successful stadium district and to not have to so called, "reinvent the wheel."

These are my suggestions for the new stadium entertainment district that would enhance the experience for those attending events there, especially UH football (and fan experience needs to be enhanced there for revenue and therefore program vitality):

1. Reduce the environmental footprint of the stadium, for example, PV panels (which may mean ensuring the proper grid) and ensuring recycling opportunities.
2. Have enough parking lots to accommodate the attendees. We shouldn't have to wait in car line one hour before kickoff for only one stadium lot open and have to park in a small gated lot off lower Halawa lot for a game with only 20,000 attendees. What happens when there are 45,000 attendees? If space becomes an issue, consider a parking structure for those who will not be tailgating or walk up ticket buyers.
3. There should be multiple parking lots that allow for tailgating. All lots and parking structure should have multiple entrances and exits to access Moanalua Road, Kahuapani Road, Kamehameha Hwy, and freeways. There should not be a line to get into lots before the game once the gates are open, unless the event is sold out.
4. There should be a shopping/dining district between the stadium and the train station and Pearl Harbor (Arizona Memorial). This could draw patrons from all three venues (see the University Village adjacent to UW athletic complex, for example).
5. There could be a park nearby the shopping district on the stadium property for patrons to enjoy. They could buy their food and picnic, walk, or play. A kids playground would be nice. This could be enjoyed by game day fans as a place for kids to play or throw the ball around as there is presently no place to do these in the current stadium lots.

Thank you for your consideration of these comments. I also look forward to offering suggestions on the stadium design.

Sincerely,
Brad Kaya

---

10422-01
December 23, 2020

Brad Kaya
Bkkaya1132@gmail.com

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Halawa, Oahu, Hawai‘i

Dear Mr. Kaya:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
Stacey Jones, Crawford Architects
From: Calvin Pham <cfpham@yahoo.com>
Sent: Tuesday, November 5, 2019 8:39 PM
To: Public Comment
Subject: NASED Comments

To the New Aloha Stadium Entertainment District Delivery Team:

Please accept my written comments to include narrative and analysis within the Environmental Impact Statement as follows:

- Regarding the Purpose and Need:
  I would like the Purpose and Need statement to explicitly include affordable housing (which should be defined as households earning 80% of area median income spending no more than 30% of that income on housing costs) in addition to stadium renovation/replacement, mixed-use development, and transit-oriented development.

- Regarding socioeconomic characteristics:
  The Department of Business, Economic Development and Tourism (DBEDT) issued a March 2015 report stating, “The forecast projects demand for an additional 64,700 to 66,000 housing units, during the 2015-2025 period... Wages and incomes have not been growing as fast as housing prices, making it harder to afford real estate in Hawaii, especially for younger and lower-income households.” The state has clearly indicated the need for more housing units for local residents. Therefore, I believe this EIS should examine affordable housing as a socioeconomic impact of the proposed project. It should quantify the impact on the state’s published housing demand.

- Regarding infrastructure, traffic, and utilities:
  The EIS should quantify the site’s maximum housing capacity (given as housing units, gross floor area, and building height). The EIS should also examine the impact of raising the maximum housing capacity of the site by constructing additional capacity or preserving space for utilities.

- Regarding public services and facilities:
  Given the March 2015 DBEDT report quantifying the need for housing units, I believe the EIS should quantify the project’s impact to public land as an opportunity cost by decreasing the developable state land area. The analysis should include a declaration of the highest and best use of the land proximate to the future rail station in the context of the Halawa Area Transit-Oriented Development Plan. This plan must “Preserve existing affordable housing and potential opportunities for new affordable housing, and as appropriate, with supportive services.” If the plan does not include the physical maximum quantity of affordable housing units, the EIS should quantify the land area that could be preserved as undeveloped parcels for the future implementation of affordable housing within the site. The State Legislature is considering a bill proposing development of high-density affordable housing on state-owned land, therefore the EIS should quantify the impact to available state land for high-density affordable housing, particularly on the rail corridor.

- Regarding air quality:
  The EIS should examine the relationship between housing units and air quality. A sensitivity analysis should be included reducing and/or eliminating parking spaces for exclusive residential use. The most aggressive analysis should examine the effects of 100% affordable housing units for transit-dependent residents who would not keep motor vehicles on site. Another air quality sensitivity analysis should assume all Swap Meet vendors and Entertainment District employees have on-site housing units that are affordable (at 30% of their income) and dedicated for their living so they can live within walking distance of their places of business.

  Regarding infrastructure, traffic, and utilities:
  The EIS should examine the relationship between increased housing units and motor vehicle traffic congestion. A sensitivity analysis should also be included reducing and/or eliminating parking spaces for exclusive residential use. The most aggressive analysis should examine the effects of 100% affordable housing units for transit-dependent residents who would not keep personal vehicles on and near the site. Another traffic sensitivity analysis should assume all Swap Meet vendors and Entertainment District employees have on-site housing units that are affordable (at 30% of their income) and dedicated for their living so they can live within walking distance of their places of business.

Calvin Foo Pham
Salt Lake Resident
96818
Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawaiʻi

Dear Mr. Pham:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawaiʻi Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
To whom it may concern,

My name is Chaz Mihara. I'm a Journalism student at the University of Hawaii at Manoa. I am doing a story for UHMTV on the New stadium. I would like to schedule a video interview with someone to get some information. My email is chazkm@hawaii.edu

Thank You,
Chaz Mihara

---

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Chaz Mihara:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
Greetings,

Please revise the proposal to add more affordable housing (80% or below AMI). The proposed 2,000 housing units need to be much higher (5,000? 7,000?) to begin to address the dire need on Oahu. This redevelopment has the huge acreage of state land and the tremendous asset of its own train station. It would be a crying shame for us not to take this opportunity to meet a vital need of our our people. Meeting that need for a home will positively impact many areas of economic, social, and personal life.

I ask for your thoughtful consideration on this matter.

Aloha,
Evelyn Hao, retired teacher and principal of Hawaii public schools
Keola Cheng & Chace Shigemasa

I came up with the idea for a new "Hawaii Heroes" museum in 2015 while serving on the Neighborhood Board for Foster Village, Alamanu, SaltLake. The museum will feature federal leaders like President Obama, Senator Inouye, Congresswoman Patsy Mink, also entertain Bruno Mars and Polynesian NFL football players. (see attached brochure).

The community backs this museum.

TOD Administrator Harrison Rue received numerous letters of support from the community in 2016.

Harrison Rue liked the museum concept for the Halawa Rail Station. Harrison Rue included the Museum in the City's final Plan, dated July 2017. (see attached). The 119-page Halawa Station Plan mentions the museum 6 times. (see attached).

Two years ago, Harrison Rue told us to wait until the state took action on the fate of Aloha stadium. The state finally took action on July 8, 2019.

This museum needs to be included in your ENTERTAINMENT DISTRICT plans.

Mahalo nui loa,
Gloria Borland
Hawaii Heroes Museum (temporary name)
(808) 781-4472

The museum is mentioned 6 times in City's Final Plan. (see attached)

Retail uses that service the basic needs of tourists, commuters, and residents. Street retail uses might include grocery stores, bakeries, convenience stores, and personal services such as banks, dry cleaners, and hair salons. Day care as well as medical offices would serve commuters and residents alike. Restaurants with outdoor dining would further contribute to an active streetscape. Entertainment uses could include theaters, health clubs, a museum, or other uses that support game day and non-game day activity.

Establish Cultural Facilities in addition to entertainment usage such as sports hall of fame to showcase notable athletes from Hawaii in professional and amateur national or international sports. In addition, as suggested by one community member, a hall of fame or museum showcasing political, cultural, and scientific leaders and innovators from Hawaii would be ideal in the Corridors plan.

The area immediately adjacent to the rail station is characterized as a high-density, high-intensity urban mix of uses. The mixed-use core is also intended to serve as the "front door" to the Halawa area. The mixed-use core should utilize the station-station connection as its central organizing element. Opportunities may include:

- Multi-modal transit linkages and accommodation of the rail station's park-and-ride function.
- Potential to incorporate an entertainment or cultural use, such as a tourist information center or museum.
- Usage of wayfinding elements to assist tourists and stadium goers.
- Ability to accommodate large amounts of parking via a below grade parking mezzanine or structured garage.
- Accommodation of a community retail anchor to serve residents and transit riders.
Mixed-use sports and entertainment districts adjacent to sports stadiums require a threshold level of development, or “critical mass”, in order to be successful. This phase represents the initial investment (aside from infrastructure preparation) a developer may make, allowing for a more intensive year-round usage of the stadium site. The uses that make up the investment rely upon the ability to create a vibrant, lively environment that a broad array of locals and visitors will be drawn to. Successful districts of this type must be large enough, and have the right mix of uses, to foster this environment. The following elements should be located adjacent to Aloha Stadium, preferably along the stadium-station connection:

- A large, programmable open space that can be used for events.
- A hotel.
- A cultural venue, such as a theater, museum, or cinema.
- Supporting retail and dining.
- Introduction of structured parking or underground parking magazines.
- Gateway signage at TOD district edges.
COMMUNITY BENEFITS

Some participants at community workshops expressed concern on who will pay for public realm improvements, and how developers will be attracted to the Halawa area. The Plan should discuss how to leverage private investment and contributions towards completing and expanding necessary public infrastructure upgrades or improvements. Such community benefits may be exchanged for development bonuses.

ALOHA STADIUM

Participants at public outreach events are curious about how Aloha Stadium will be affected by TOD. State organisations, such as the Stadium Authority and the Department of Accounting and General Services (DAGS) have led the discussions during the planning process about the future of the stadium, and their leadership has been helpful for public outreach and development scenarios. The State will ultimately determine the future redevelopment of the stadium site.

ADDITIONAL PEDESTRIAN CONNECTIONS

To increase overall connectivity within the Halawa area, it has been suggested by stakeholders and by members of the public that additional pedestrian connections be considered through and around the Stadium/Station area. These include connections to central Ala Moana, permanently opening the pedestrian bridge over Interstate 201, access to Halawa Stream, and providing an alternate pedestrian connection from Aloha Stadium Station to the Pearl Harbor Visitor Center.

ENTERTAINMENT/CULTURAL VENUES

Some thought has been given by the public on what types of venues could act as a complement to Aloha Stadium. Examples include an outdoor amphitheater, a relocated Ice Palace, a museum honoring prominent citizens and residents of Hawaii, entertainment venues that may cater to visiting military personnel and other attractions or museums that may play off of synergies between the Pearl Harbor Visitor Center and Aloha Stadium.

DEVELOPMENT SITES

Members of the public are curious on the impact that TOD will have on the largely single-family communities that make up the Halawa area. It should be made clear in this document and in future planning efforts where development is likely to occur.
3. RETAIL AND ENTERTAINMENT

Retail uses that service the basic needs of tourists, commuters, and residents. Street retail uses might include grocery stores, bakeries, convenience stores, and personal services such as banks, dry cleaners, and hair salons. Day care as well as medical offices would serve commuters and residents alike. Restaurants with outdoor dining would further contribute to an active streetscape. Entertainment uses could include theaters, health clubs, a museum, or other uses that support game day and non-game day activity.

4. DIVERSE HOUSING

Provide a variety of housing types that appeal to a diversity of lifestyles, including transit-oriented young families, empty nesters, and singles. A mix of affordable, for-sale and rental housing should incorporate design features that promote street orientation and pedestrian scale. Site and building design should take advantage of mountain and coastal views and prevailing breezes, including courtyards and rooftop amenities.

3.1.2 THE PLAN’S KEY CHARACTERISTICS

The Halawa Area TOD Plan’s key characteristics and specific advantages are depicted in Figure 3-8. They include:

**LAND USE SUMMARY PLAN COMPONENTS**

- Relocate Aloha Stadium to a new 30,000-40,000 seat stadium. This frees up developable land in the center of the stadium site. Phasing of the relocation so as to maintain use of the existing stadium while constructing the new one is an important criterion.
- Create an Appealing Gateway of mixed-use and entertainment uses from the transit station to the stadium. Establishing a strong visual and aesthetic core and connection between station and the stadium.
- Enhance and Balance the Energy of the District by creating both daytime and nighttime activities. The maximum development of retail and office space (up to 2.6 million GSF) on the stadium site will provide a critical mass of activities to take advantage of transit, populate the site during non-game days, and improve safety and walkability of the area for residents.
- Establish a Single 200-300 Room Hotel for military, business, and sports travelers.
- Establish an Office/Institutional Campus appropriately located on the mauka side of stadium. An athletic theme would provide natural synergies with the stadium and the sports and entertainment districts. For flexibility, "creative office" units could substitute or add diversity to a sports and fitness institute.
- Concentrate Most of the Ground Floor Retail Space appropriately along the mixed-use corridor and around central open spaces.
- Encourage High-Density Residential Mixed-Use close to stadium area. Density projections of housing assumes 2,000 new residential units over the entire 100 acre Stadium Site. A density of 20 dwelling units per acre will be within the PUC transit-oriented preferred densities or between 13 to 16 dwelling units per acre. High density residential, not to exceed 250 feet to minimize blocking important views, will help with financial feasibility.
- Line Salt Lake Boulevard with Street-level Retail to serve the convenience needs of new residential units above and for the surrounding neighborhoods. This mixed-use district would be no higher than 4 floors above street level, where an eclectic mix and variety of stores and shopping opportunities creates its own engaging street vibe and appeal.

- **Provide Oceanside Use,** such as use with different operating hours from retail use. This provides opportunities for shared parking with a variety of parking structures quite dissimilar from the existing expanse of surface parking. A parking management program can allow Aloha Stadium to manage it’s parking needs.

- **Establish High-Density Mixed-Use Redevelopment** at Pukalani Momi, and medium-density, longer term development at Stadium Mall, Stadium Marketplace, and Aina Elementary School sites.

- **Establish Cultural Facilities** in addition to entertainment usage such as sports hall of fame to showcase notable athletes from Hawaii in professional and amateur national or international sports. In addition, as suggested by one community member, a hall of fame or museum showcasing political, cultural, and scientific leaders and innovations from Hawaii would be ideal in the Coordinated plan.

**OPEN SPACE IMPROVEMENTS**

- **Provide a Multi-functional Landscaped or Hardscaped Open Space** fronting of Aloha Stadium designed as an outdoor amphitheater for multi-functional events.

- **Extend Pedestrian and Bicycle Improvements** to adjoining development areas from the stadium area, including Stadium Marketplace, Stadium Mall, Ala Elementary School, and Pukalani Momi Public Housing, integrate Halawa Stream with pedestrian and bicycle networks to facilitate connections to adjacent development sites and complete the overall open space network.

- **Provide a Gathering Place** below H-1 at Stadium Mall.

**TRANSPORTATION IMPROVEMENTS**

- **Provide an Outer, "Ring" Road** along the perimeter of the stadium site. In order to improve vehicle flow and provide access to the institutional campus and stadium.

- **Provide an Intersection** at Kamehameha Highway front of Salt Lake Boulevard.
3.1.2 PLANNING AREA SUB-DISTRICTS

Each sub-district provides an idea of the preferred land use character of its specific locale to the Corridor scenario. The characteristics of each sub-district are described and explained as to how they complement the vision, contribute to potential opportunities, and fulfill the goals of transit-oriented development. Figure 3-9 provides a depiction of sub-district boundaries.

MIXED-USE CORRIDOR

The area immediately adjacent to the rail station is characterized as a high-density, high-intensity urban mix of uses. The mixed-use core is also intended to serve as the "front door" to the Kaimuki area. The mixed-use core should utilize the station-platform connection as its central organizing element. Opportunities may include:

- Multi-modal transit linkages and accommodation of the rail station's park-and-ride functions.
- Potential to incorporate an entertainment or cultural use, such as a tourist information center or museum.
- Usage of wayfinding elements to assist tourists and stadium goers.
- Ability to accommodate large amounts of parking via a below grade parking mezzanine or structured garage.
- Accommodation of a community retail anchor to serve residents and transit riders.

ALOHA STADIUM

A rebuilt Aloha Stadium located closer to Pearl Harbor along Kamehameha Highway opens up land for other purposes. Other opportunities include:

- Incorporation of retail, dining, and other venues common in NFL stadiums.
- A hall of fame for all Hawaii sports.
- Configuration of the stadium to maximize views.
- Create an appropriate sense of arrival.

INSTITUTIONAL DISTRICT

An office or institutional campus (e.g., sports performance, exercise science, physical/occupational therapy) located adjacent to the stadium would provide natural synergies with the nearby stadium and mixed-use development district, and could incorporate athletic fields. A cluster of office buildings around landscaped green spaces could also offer an attractive opportunity for a large campus-style office development that is in close proximity to the district's amenities, while maintaining a critical mass that office users will desire. Opportunities include:

- Utilization of open spaces/athletic fields for public use.
- Designation of a surface pedestrian right-of-way to better connect Aloha Stadium to the area Elementary School District.

THE GATHERING PLACE

The "Gathering Place" is an active, open space fronting Aloha Stadium. It acts as the hub of pedestrian connections and is surrounded by a reserve of Moanalua Park, The Gathering Place is intended to be a flexible, multifunctional landscaped or landscaped open space which could be the setting for community events such as the Great Aloha Fun Run, football rally nights, movie shows, farmers markets, and the Swap Meet and Marketplace.
5.4.3 PHASE 2: ALOHA STADIUM
Replacement of the current Aloha Stadium with a contemporary, first-class stadium with a smaller capacity presents exciting opportunities for ancillary development around the stadium and the new rail station. However, major sports stadiums take many years of pre-development planning even before construction can begin. No matter where Aloha Stadium is planned to be located, the stadium site, its location, and the surrounding area will be crucial in determining the character of mixed-use development and the sports and entertainment component of the Halawa area.

Aloha Stadium is proposed to be relocated slightly west of the current stadium location, allowing for the potential for a phased construction/demolition process in a compact area. This may minimize any potential disruptions to stadium events, such as UH home games, and maximize the remainder of the site for parking or additional development. The following additional improvements could be provided at this phase:

- Improved vehicular accessibility to the stadium site, such as a ramp from the H-1 freeway.
- Provide connectivity and introduce an internal street grid based on Complete Streets concepts and guidelines within the stadium site to eliminate surface parking lots, structures, or future development sites.
- Potential reorganization or on-site relocation of the Swap Meet.
- Potential realignment of area streets, such as Salt Lake Boulevard, to optimize stadium traffic and/or future development.

5.4.4 PHASE 3: GATHERING PLACE
Mixed-use sports and entertainment districts adjacent to sports stadiums require a threshold level of development, or "critical mass," in order to be successful. This phase represents the initial investment (aside from infrastructure preparation) a developer may make, allowing for a more intensive year-round usage of the stadium site. The elements that make up the investment rely upon the ability to create a vibrant, lively environment that a broad array of locals and visitors will be drawn to. Successful districts of this type must be large enough, and have the right mix of uses, to foster this environment. The following elements should be located adjacent to Aloha Stadium, preferably along the stadium-station connection:

- A large, programmable open space that can be used for events.
- A hotel.
- A cultural venue, such as a theater, museum, or cinema.
- Supporting retail and dining.
- Introduction of structured parking or underground parking garages.
- Gateway signage at TOD district edges.
BRUNO MARS

BETTIE MIDLER

Dwayne Johnson
Grew up in Honolulu. Attended McKinley High School.

The City and County of Honolulu has allocated space in their draft plans to include a historical museum at the Halawa Rail Station near Aloha Stadium. Residents and visitors alike will walk away knowing this untold story of Hawaii. We need community support to make this museum a reality. Please contact your City Council member to express your support. The Multi-Media Democracy Museum will honor American presidents and congressional leaders who were influenced by Hawaii and work to improve the progress of Democracy.

Hawaii’s 442nd Regiment shipped off to Europe in 1943. The 442 was segregated for Americans of Japanese ancestry. Hawaii’s 442nd earned the “Lost Battalion” from Texas the 36th Division was surrounded by German soldiers on France in 1944. The 442 is the most highly decorated regiment in US Army history.

After walking on the moon, Apollo astronauts greeted by President Richard Nixon at Pearl Harbor Hawaii 1969.

Before they were president, John F. Kennedy, George H. Bush and Jimmy Carter were young Naval officers stationed at Pearl Harbor.

Born in Maui to a missionary family, Samuel Chapman Armstrong graduated from Punahou School in 1879. During the Civil War he fought at Gettysburg and then volunteered to lead a segregated colored-troop.

After the war, Armstrong founded Tuskegee Institute in Virginia to educate former slaves. His protégé was Booker T. Washington who founded Tuskegee Institute in Alabama.

© 2010 by Gloria Bartlett
Hawaii Sports Museum
Olympians


Hawaii’s Bryan Cave won the Olympic Gold Medal in Decathlon at the Beijing Olympics in 2008.

Bryan Cave grew up on Oahu’s north shore, he graduated from Castle High School.

Hawaii Sports Museum
Hawaii’s NFL Players

Mark Tuinei - NFL
Dallas Cowboys
Graduated, Punahou School, 1978

Dallas Cowboys 1983-1997
2 times Pro Bowl 1994, 1995

Marcus Mariota – NFL
Tennessee Titans, Graduated, St. Louis High School, 2011

Tennessee Titans 2015-present
Heisman Trophy 2014

NOTABLE NFL PLAYERS
OF SAMOAN DESCENT

<table>
<thead>
<tr>
<th>PLAYER</th>
<th>POSITION</th>
<th>PRIMARY TEAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mike Iupati</td>
<td>OL</td>
<td>San Francisco 49ers</td>
</tr>
<tr>
<td>Marcus Mariota</td>
<td>QB</td>
<td>Tennessee Titans</td>
</tr>
<tr>
<td>Troy Polamalu</td>
<td>DB</td>
<td>Pittsburgh Steelers</td>
</tr>
<tr>
<td>Jesse Sarouli</td>
<td>OL</td>
<td>San Francisco 49ers</td>
</tr>
<tr>
<td>Junior Seau</td>
<td>LB</td>
<td>San Diego Chargers</td>
</tr>
<tr>
<td>Mya Tanuvasa</td>
<td>DE</td>
<td>Denver Broncos</td>
</tr>
<tr>
<td>Moa Tatupu</td>
<td>RB</td>
<td>New England Patriots</td>
</tr>
<tr>
<td>Manti Te’o</td>
<td>LB</td>
<td>Seattle Seahawks</td>
</tr>
<tr>
<td>Mark Tuinei</td>
<td>OL</td>
<td>Dallas Cowboys</td>
</tr>
</tbody>
</table>
The roots of innovation can be traced to the 1870s and Hawaii’s **King David Kalakaua**, a Renaissance man, scientist and inventor. The King was friends with Thomas Edison and in 1886 he installed electricity at Iolani Palace in Honolulu, four years before the White House had lights. King Kalakaua invented an improved double screw and an improved bottle stopper in 1872. He also invented a new fish ram and a torpedo-proof vessel in 1875.

**Hawaii Inventors**  
**Hawaii Museum**

---

**Verifone** was invented in Hawaii.

[Image of a Verifone device]

**Bill Melton** founded VERIFONE the first electronic point of sale terminal in 1981 to help merchants with verifying check and credit card payments in Hawaii. A University of Hawaii engineer **Jimmy Thomson** developed Verifone’s technology.

One of the young interns working under engineer Jimmy Thompson was **Steve Case**, who later became CEO of AOL.

After hitting $30 million in sales, Verifone moved to California in 1985 and was bought by Hewlett Packard in 1997. Today Verifone is in 150 countries, has 50% of the world’s non-cash transactions, and process $7.6 Billion transactions a year.

Verifone is the only global billion-dollar company produced from Hawaii.

---

**Hawaii Sports Museum**  
**Women Sports & Title IX**


**Clarissa Moore**  
**World Champion Surfer**

---

**King David Kalakaua** received two U.S. patents for his inventions.
The Environmental Notice

10422-01
December 23, 2020

Gloria Borland
gbor@aol.com

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Ms. Borland:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
I appreciate the opportunity to provide input on the new stadium.

I support construction of a new stadium, and I accept its reduced capacity. However, I suggest a stadium that can be temporarily expanded to 40,000 for major events. I hope that all parties - architects, engineers, and vendors can meet this request.

I support option A, building the stadium on its present footprint. Option A would not require razing the parking area, cutting that cost.

Why are athletic facilities not meant to host events part of Option A? Public park space should not be in the purview of Aloha Stadium. A better idea would be to build mini Aloha Stadium, a 3,000 seat stadium with everything the main stadium has, locker rooms, scoreboard, etc. It would be an affordable option for smaller organizations, or the the stadium could host simultaneous high school football games.

For option B, why was building an arena not considered? I wonder if a 15,000 to 18,000 seat arena could fit on the current stadium site?

What are educational and cultural amenities? Who may use these spaces, and will there be rental fees for these spaces? Again, park space shouldn't be in the purview of a stadium authority.

I am opposed to the entertainment district in all proposals. Aloha Stadium is close to Pearlridge Center and Pearl Highlands Center. Additionally, Alea Bowl bowling alley and the Ice Palace ice skating rink are next to the stadium - an entertainment district seems unnecessary. Also, retail space doesn't make sense. Also Shopping Center, Stadium Mall, and Stadium Marketplace are right near the Stadium's boundaries. The only retailer that should be allowed is the University of Hawaii's official store. Other retailer development should not take place.

There is a benefit to building a hotel on stadium property. medical tourism. Pali Momi hospital is right next to Pearlridge Shopping Center, and Kaiser Permanente hospital is in Moanalua. Patients undergoing outpatient surgery will have another hotel option.

Why wasn't closing down the stadium an option? Would there be cost savings in shutting down and building without keeping the stadium open? It should be noted that more Oahu high schools now have artificial surface fields. Also, Maui War Memorial Stadium has the ability to host University of Hawaii football games.

I feel that the three options overestimate rail's impact on traffic. After all, though the driving can be slow, it's door to door service, so to speak. Also, less parking means less tailgating, and some ill will at being price gouged at the concessions.

I look forward to a new Aloha Stadium. I appreciate a field that can handle football, rugby and soccer. Though rare, being able to join a rugby world cup, or soccer world cup bid would be nice. The reduced cost of maintaining a new stadium will be very appreciated.

May this project meet budget and be finished on time. Thank you for the opportunity to comment.
Hello Wilson

I have a couple of questions regarding the Aloha Stadium Redevelopment. I read that the number of seats will be reduced from 50,000 to 35,000. Since the plan is to add retail space and hotel and residential units and office space, is that the reason for reducing the amount of seats in the stadium? Will that not affect the decision of artists and sports organizations to rethink about coming to Hawaii to hold their events? Unless the music artists perform in more than one show, wouldn’t the music artist gain more in one show with 50,000 seats versus having less seating?

Plus, wouldn’t the sports organization gain more in a stadium seated for 50,000 people versus having less seats unless they are having more than one game? What if these artists and organizations decide not to come to Hawaii because the amount of tickets sold may not be worthwhile to cover the overhead costs and have less profit.

Also, I hope that the plan includes easier access for the senior citizens and the disabled. I also hope the restrooms will be height friendly, especially in the women’s restrooms. For example, making sure that the toilet seat cover and toilet paper and handbag hook is low and closer to the toilet for small people will be able to reach.

I would appreciate a prompt response.

Thank you
Janis

---

From: Jan Ishiki <jansffz@live.com>
Sent: Saturday, October 5, 2019 3:53 AM
To: Public.Comment
Subject: Aloha Stadium Redevelopment

Hello Wilson

I have a couple of questions regarding the Aloha Stadium Redevelopment. I read that the number of seat will be reduced from 50,000 to 35,000. Since the plan is to add retail space and hotel and residential units and office space, is that the reason for reducing the amount of seats in the stadium? Will that not affect the decision of artists and sports organizations to rethink about coming to Hawaii to hold their events? Unless the music artists perform in more than one show, wouldn’t the music artist gain more in one show with 50,000 seats versus having less seating?

Plus, wouldn’t the sports organization gain more in a stadium seated for 50,000 people versus having less seats unless they are having more than one game? What if these artists and organizations decide not to come to Hawaii because the amount of tickets sold may not be worthwhile to cover the overhead costs and have less profit.

Also, I hope that the plan includes easier access for the senior citizens and the disabled. I also hope the restrooms will be height friendly, especially in the women’s restrooms. For example, making sure that the toilet seat cover and toilet paper and handbag hook is low and closer to the toilet for small people will be able to reach.

I would appreciate a prompt response.

Thank you
Janis
Regarding "Option B"

Is there any potential safety concern with the Stadium being located too close to Kam Highway? For Example: Federal Buildings are required to have a significant setback from roadways to help to prevent a potential "terrorist attack."

---

Email from Jason Sumner:

From: Jason Sumner <sumner.lasvegas@gmail.com>
Sent: Friday, September 27, 2019 2:06 PM
To: Public Comment
Subject: NASED Comment/Question

Dear Mr. Sumner:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your email, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
     Stacey Jones, Crawford Architects
I believe that the Aloha Stadium redevelopment should include MORE THAN 2,000 units! Please, more affordable housing!

Since the redevelopment takes place on 98 acres of state-owned property, and has access to its own rail station, this is an ample opportunity for the state to develop a mass amount of affordable housing units (80% AMI or below) and to aid Oahu's critical housing crisis. The EIS should quantify the impact on the state’s published housing demand.

Mahalo.

Linda Green
Aloha,

I strongly believe the New Aloha Stadium entertainment District should include much more than 2,000 housing units. Since the redevelopment takes place on 98 acres of state-owned land and has access to its own rail station, this is a great opportunity to develop a mass amount of affordable housing units (80% AMI or below) to aid Oahu’s critical housing crisis.

Please consider revising this proposal to include a larger mass of housing units to meet the needs of the area’s population.

Thank you very much.

Liz Nelson
Faith Action for Community Equity

---

10422-01
December 23, 2020

Liz Nelson
Faith Action for Community Equity
hawaiizie@gmail.com

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hilalwa, Oahu, Hawaii

Dear Ms. Nelson:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai’i Administrative Rules, Title 11, Chapter 200.1, Section 24.

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We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
Dear EIS folks,

Aloha and thank you for taking public input on your study decision-making.

I strongly believe the New Aloha Stadium Entertainment District should include much more than 2,000 housing units. Since the redevelopment takes place on 98 acres of state-owned property, and has access to its own rail station, this is an ample opportunity for the state to develop a mass amount of affordable housing units (80% AMI or below) and to aid Oahu’s critical housing crisis. Please consider revising this proposal to include a larger mass of housing units to meet the needs of the area’s growing population.

Mahalo,

Marian Heidel
Kailua, HI 96734

---

10422-01
December 23, 2020

Marian Heidel
Mheidel808@icloud.com

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Halawa, Oahu, Hawai’i

Dear Ms. Heidel

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai’i Administrative Rules, Title 11, Chapter 200.1, Section 24.

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We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
Aloha,
I strongly believe the New Aloha Stadium Entertainment District should include much more than 2,000 housing units. Since the redevelopment takes place on 98 acres of state-owned property, and has access to its own rail station, this is an ample opportunity for the state to develop a mass amount of affordable housing units (80% AMI or below) and to aid Oahu’s critical housing crisis. Because it is near the rail station, it will also help with traffic. Please consider revising this proposal to include a larger mass of housing units to meet the needs of the area’s growing population. I could certainly benefit from some more affordable housing but will probably have to leave the islands before there are enough units available. Mahalo,
Mary Carolyn Kuahulu

Mary Carolyn Kuahulu
dukiecarol@aol.com

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Halawa, Oahu, Hawai‘i

Dear Ms. Kuahulu:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

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We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
Stacey Jones, Crawford Architects
From: Nanea Lo <naneaclo@gmail.com>
Sent: Wednesday, September 25, 2019 12:04 AM
To: Public Comment
Subject: More Housing NOW.

Hello,

I strongly believe the New Aloha Stadium Entertainment District should include much more than 2,000 housing units. Since the redevelopment takes place on 98 acres of state-owned property, and has access to its own rail station, this is an ample opportunity for the state to develop a mass amount of affordable housing units (80% AMI or below) and to aid Oahu’s critical housing crisis. Please consider revising this proposal to include a larger mass of housing units to meet the needs of the area’s growing population.

Me ke aloha ‘aina,

Nanea Lo
Phone: 808-845-3504
Email: naneaclo@gmail.com
https://www.linkedin.com/in/naneaclo

Some people say that Hawai’i will be a better place when Hawaiians no longer stand in the way of progress. But even these people must know that at this point, this will no longer be Hawai’i. - Jonathan Kay Kamakawiwo’ole Osorio. The Value of Hawai’i

---

From: Nanea Lo <naneaclo@gmail.com>
Sent: Monday, October 14, 2019 2:50 PM
To: Public Comment
Subject: Aloha Stadium EIS (Environmental Impact Study)

Follow Up Flag: Follow up
Flag Status: Flagged

Hello,

I strongly believe the New Aloha Stadium Entertainment District should include much more than 2,000 housing units. Since the redevelopment takes place on 98 acres of state-owned property, and has access to its own rail station, this is an ample opportunity for the state to develop a mass amount of affordable housing units (80% AMI or below) and to aid Oahu’s critical housing crisis. Please consider revising this proposal to include a larger mass of housing units to meet the needs of the area’s growing population.

Me ke aloha ‘aina,

Nanea Lo
Phone: 808-845-3504
Email: naneaclo@gmail.com
https://www.linkedin.com/in/naneaclo

Some people say that Hawai’i will be a better place when Hawaiians no longer stand in the way of progress. But even these people must know that at this point, this will no longer be Hawai’i. - Jonathan Kay Kamakawiwo’ole Osorio. The Value of Hawai’i
Hello,

My name is Nanea Lo. I come from Papakōlea, O‘ahu, but I currently reside in Kaimuki. I am a kanaka maoli (native Hawaiian) master’s student at UH Mānoa in the Department of Urban and Regional Planning. I am writing it to say that I STRONGLY BELIEVE the New Aloha Stadium Entertainment District should include much more than 2,000 housing unit. Since the redevelopment takes place on 98 acres of de facto state-owned property, and has access to its own rail station, this is an ample opportunity for the state to develop a mass amount of affordable housing units (80% AMI or below) and to aid O‘ahu’s critical housing crisis. The EIS should quantify the impact on the de facto state’s published housing demand.

Me ke aloha ‘āina,

--
Nanea Lo

Phone: (808)454-3604
Email: nanealo@gmail.com

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https://www.facebook.com/ournativestories/

Some people say that Hawai‘i will be a better place when Hawaiians no longer stand in the way of progress. But even these people must know that at this point, this will no longer be Hawai‘i.-Jonathan Kae-Kamakawo‘ole Osoro. The Value of Hawai‘i

---

10422-01
December 23, 2020

Nanea Lo
nanealo@gmail.com

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Nanea Lo:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

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We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects

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

Mahalo for this chance to comment on the Aloha Stadium Entertainment District environmental impact study.

I was disappointed to read that it is currently planned to include only 2,000 housing units. Considering the affordable housing crisis on Oahu, as well as the huge size of the development on state land, our community will have missed a tremendous opportunity to build many additional units, and at affordable levels, meaning at or below 80 percent of area median income.

We can’t afford to let this chance to make a real dent in our affordable housing crisis pass us by. Please include an analysis of the district’s impact on housing demand in the EIS.

Thank you,

Nicole Woo
Honolulu resident
From: Wilson Okamoto Corporation
Sent: Monday, December 30, 2019 8:27 AM
To: Keola Cheng; Dalton Beauprez
Subject: FW: Contact Form on Wilson Okamoto Website

Jeanine S.H.Y. Morioka
Senior Project Administrator

1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826
T (808) 946-2277 F (808) 946-2253
W http://www.wilsonokamoto.com

This message contains information that might be confidential and privileged. Unless you are the addressee or are authorized by the sender, you may not use, copy or disclose the information contained in this message. If you have received this message in error, please delete it and advise the sender.

—— Original Message ———
From: Wilson Okamoto Website [mailto:web@wilsonokamoto.com]
Sent: Sunday, December 29, 2019 2:55 PM
To: wcwebform@gmail.com
Subject: Contact Form on Wilson Okamoto Website

Name: Owen Tamamoto
Company: Imua Pickleball Hui
Email: ntamaok@gmail.com
Phone: 808-233-8698
Comment: This message is intended for Mr. Keola Cheng.
On behalf of Imua Pickleball Hui, I am inquiring about the possibility of adding pickle ball courts to New Aloha Stadium Entertainment District plans. We are hoping that multi-use recreational areas include pickle ball courts.

This e-mail was sent from a contact form on Wilson Okamoto
(https://linkprotect.cudasvc.com/url?i=http%3a%2f%2fwww.wilsonokamoto.com&c=E1,6Ulc6bnK75488a33WcQ50o68W4VWemYh4iwhjx50X205/33vY6GMgEsJ2JrE300lwmy3j7VOMMc3q7N-ps分开xyizzp46h/HpvHv/95Vw0q6N6Gt, &type=1)

10422-01
December 23, 2020

Owen Tamamoto
Imua Pickleball Hui
ntamaok@gmail.com

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Mr. Tamamoto:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i’s Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
Stacey Jones, Crawford Architects

1907 S. Beretania Street, Suite 400 • Honolulu, Hawaii • 96826 • (808) 946-2277
From: Randy Ching <makikirandy@yahoo.com>
Sent: Monday, October 14, 2019 12:44 PM
To: Public Comment
Subject: Aloha Stadium EIS

Follow Up Flag: Follow up
Flag Status: Flagged

Aloha. I am offering comments to the EIS for the proposed re-development of Aloha Stadium which sits on a 98-acre parcel of public land.

There are 3 things which would make rental housing units (badly needed here on Oahu) more available on the 98 acres.

1) Tear down the current stadium and build a new one on UH Manoa's lower campus (aka "The Quarry"). Make the new stadium's seating capacity 25,000. That way, it could fit in where the 2 large grass practice fields are now. Yes, the softball stadium and some tennis courts would have to be relocated. But many more students would attend UH sporting events with an on-campus stadium. And the lower campus already has a sizable parking lot.

2) Do not include any parking for the new rental housing units that will be built on the 98 acres. There could be 20,000 to 25,000 rental units built on the site if you don't build any parking lots. The reason is two-fold. One, there will be a rail station at the stadium site. Two, TOD around that rail station means that everything you need on a daily basis will be within 10 minutes by foot. You won't need a car!

3) Oahu will need 60,000 rental units in the next decade. The stadium site could provide 1/3 to 5/12 of the projected need. That is huge. We need rental housing more than we need a new stadium. If you insist on the new stadium being on the current site, use only 20 acres for it. The other 78 acres should be rental housing -- if there has to be mixed use, then put the retail on the first floor and everything above that should be rentals. This way, you could provide 15,000+ units for rent (about a quarter of Oahu’s needs).

Please consider revising this proposal to include a larger mass of housing units to meet the needs of the area's growing population. Mahalo.

Randy Ching
Kalihi
makikirandy@yahoo.com
942-0145

From: Randy Ching <makikirandy@yahoo.com>
Sent: Thursday, November 7, 2019 7:31 AM
To: Public Comment
Subject: Aloha Stadium redevelopment EIS comments

Comments for EIS:
Aloha Wilson Okamoto,

I believe the New Aloha Stadium Entertainment District should include 20,000 housing units, specifically rental units in the price range of $500 to $1000 a month. There should be no parking requirements for the rental units because 1) the rail station will be within a half mile of the site and 2) the TOD around the stadium will provide everyday needs within walking distance. Ideally, there will be no parking at all -- every square inch of the site will be used for rental housing and mixed-use development. The Stadium Authority should tear down Aloha Stadium and put the new stadium (25,000 seats) in the UH-M lower campus.

Every person who rents a unit should be given a transit pass every month for rail and bus use. This will incentivize tenants to NOT own a car. There should be a BIKE station with at least 100 bicycles for rent. For the folks who drive to the retail shops, at least 25% of the stalls should be EV charging stations (type 2) with options to pay for fast charging. Finally, there should be EV Handi-Vans to transport those unable to walk, bike, bus.

To support local farmers, there should be a farmer's market at least once a week (preferably twice a week) within the 98-acre site. The farmer's market could even be held in conjunction with the swap meet. There should be 1 acre set aside for community gardens. Every tenant who wants a 10' x 10' plot should be able to have one. The one acre garden should have water and mulch available for all gardeners. The water could be partially supplied by catchment systems, cisterns, water tanks, rain barrels, and re-used water from aquaculture (tilapia/lettuce) setups.

To the maximum extent possible, gray water should be used to flush toilets and irrigate landscaping plants. The gray water can (should) be treated biologically, not chemically. All housing units should have "purple pipes" which are connected to a water treatment plant. The water from the treatment plants can be for any non-potable uses. The treatment plant should be on-site to minimize the cost of piping (both for sewage and "purple pipe").

Electricity should be 100% renewable -- preferably solar + battery storage. There will be lots of roof space for PV panels. The power plant should be located on-site (a micro grid for the 20,000 units). This will be part of a distributed generation system -- Oahu should...
The Environmental Notice

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Mr. Ching:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
Aloha,

I strongly believe the New Aloha Stadium Entertainment District should have a main focus on affordable housing. The proposed 2,000 housing units is not enough and we should start with building all the affordable units as phase 1 of the redevelopment. The stadium redevelopment should not start until we get affordable units built and operational. The Stadium should be seen as an incentive after addressing our housing crisis.

We have a chance to show our people what our priorities are: sports/entertainment or serving those who are suffering immensely. We assisted in creating this affordable housing crisis it’s our kuleana to be the main driver in its solution.

Since the redevelopment takes place on 98 acres of state-owned property, and has access to its own rail station, this is an ample opportunity for the state to develop a mass amount of affordable housing units (80% AMI or below) and to aid Oahu’s critical housing crisis. The EIS should quantify the impact on the state’s published housing demand.

Mahalo.

*Comments and testimony represents my own personal views and not that of professional or employment positions I may have.

---

Randy Gonce

Administrative Assistant on Homelessness - Hawaiʻi State Executive Branch
Executive Committee Member - Young Progressives Demanding Action
State Central Committee Representative - Veterans Caucus of Democratic Party
Board Member - Drug Policy Forum of Hawaiʻi
Board of Directors - Ka Iu Lila – Specializing in Native Hawaiian Plants and Lei Communications Chair - Board Member - Partners in Care (Hawaiʻi’s Homelessness Continuum of Care)

"Love and compassion are necessities, not luxuries. Without them, humanity cannot survive."
-Thomas Gyaltsen, the 14th Dalai Lama
I support having more affordable housing in Hawai‘i. At present, we are pricing our future generations out of the housing market. We need to stop building expensive housing and think of the children who go to the mainland to live, because of all the money they save by living there. Why should we be spending more then half of our paycheck for housing? It is not feasible. Families are affected by the fact that it costs a lot of money to live in Paradise. Please increase the affordable housing quota to double the chances for our children to live in Hawai‘i. Mahalo and God Bless.

Doris Lee, FACE member at Wahiawa United Methodist Church
Aloha,
I strongly believe the New Aloha Stadium Entertainment District should include much more than 2,000 housing units. Since the redevelopment takes place on 98 acres of state-owned property, and has access to its own rail station, this is an ample opportunity for the state to develop a mass amount of affordable housing units (80% AMI or below) and to aid Oahu's critical housing crisis. Please consider revising this proposal to include a larger mass of housing units to meet the needs of the area's growing population and critical housing needs.

Mahalo,

--
Soo Schake
Organizing Assistant
Faith Action for Community Equity
(808) 989-9398
www.faithactionhawaii.org

"Until the great mass of the people shall be filled with the sense of responsibility for each other's welfare, social justice can never be attained." - Helen Keller

10422-01
December 23, 2020

Soo San Schake
FACE
office@faithactionhawaii.org

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Soo Schake:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i’s Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects

1907 S. Beretania Street, Suite 400 • Honolulu, Hawaii • 96826 • (808) 946-2277
From: Steven Costa <thnxkeakua@gmail.com>
Sent: Thursday, November 7, 2019 8:21 AM
To: Public Comment
Subject: Aloha Stadium Re-Development

Aloha! I had the opportunity to attend the first meeting a few weeks ago, for the first meeting on planing to redevelop Aloha Stadium. I was saddened to hear, that so few low cost housing units were part of the initial plans.

Regarding the Purpose and Need:
I would like the Purpose and Need statement to explicitly include affordable housing (which should be defined as households earning 80% of area median income spending no more than 30% of that income on housing costs) in addition to stadium renovation/replacement, mixed-use development, and transit-oriented development.

- Regarding socioeconomic characteristics:
The Department of Business, Economic Development and Tourism (DBEDT) issued a March 2015 report stating, “The forecast projects demand for an additional 64,700 to 66,000 housing units, during the 2015-2025 period... Wages and incomes have not been growing as fast as housing prices, making it harder to afford real estate in Hawai‘i, especially for younger and lower-income households.” The state has clearly indicated the need for more housing units for local residents. Therefore, I believe this EIS should examine affordable housing as a socioeconomic impact of the proposed project. It should quantify the impact on the state’s published housing demand.

- Regarding infrastructure, traffic, and utilities:
The EIS should quantify the site’s maximum housing capacity (given as housing units, gross floor area, and building height). The EIS should also examine the impact of raising the maximum housing capacity of the site by constructing additional capacity or preserving space for utilities.

- Regarding public services and facilities:
Given the March 2015 DBEDT report quantifying the need for housing units, I believe the EIS should quantify the project’s impact to public land as an opportunity cost by decreasing the developable state land area. The analysis should include a declaration of the highest and best use of the land proximate to the future rail station in the context of the Halawa Area Transit-Oriented Development Plan. This plan must “Preserve existing affordable housing and potential opportunities for new affordable housing, and as appropriate, with supportive services.” If the plan does not include the physical maximum quantity of affordable housing units, the EIS should quantify the land area that could be preserved as undeveloped parcels for the future implementation of affordable housing within the site. The State Legislature is considering a bill proposing development of high-density affordable housing on state-owned land, therefore the EIS should quantify the impact to available state land for high-density affordable housing, particularly on the rail corridor.

- Regarding air quality:
The EIS should examine the relationship between housing units and air quality. A sensitivity analysis should be included reducing and/or eliminating parking spaces for exclusive residential use. The most aggressive analysis should examine the effects of 100% affordable housing units for transit-dependent residents who would not keep motor vehicles on site. Another air quality sensitivity analysis should assume all Swap Meet vendors and Entertainment District employees have on-site

housing units that are affordable (at 30% of their income) and dedicated for their living so they can live within walking distance of their places of business.

- Regarding infrastructure, traffic, and utilities:
The EIS should examine the relationship between increased housing units and motor vehicle traffic congestion. A sensitivity analysis should also be included reducing and/or eliminating parking spaces for exclusive residential use. The most aggressive analysis should examine the effects of 100% affordable housing units for transit-dependent residents who would not keep personal vehicles on and near the site. Another traffic sensitivity analysis should assume all Swap Meet vendors and

Entertainment District employees have on-site housing units that are affordable (at 30% of their income) and dedicated for their living so they can live within walking distance of their places of business.

Attachments area
Here you go.
Thank you!
Thanks!
Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Mr. Costa:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 200.1, Section 24.

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We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
From: Wayne Mukai <waynemukai@gmail.com>
Sent: Wednesday, September 25, 2019 9:26 AM
To: Public Comment
Subject: New Stadium Design

Aloha Wilson!

In looking at the artist rendition of the proposed new stadium, it seems to be a low roof U-shape design. Is there any chance you could provide MORE seats on the sidelines and go HIGHER?? Sideline seats are much more desirable for Football viewing vs. the end zone and you can sell the seats for much more $$$

??

Wayne Mukai
waynemukai@gmail.com

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

Dear Mr. Mukai:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i Administrative Rules, Title 11, Chapter 2001, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
From: Robert H Stiver <bobfromoahu@gmail.com>
Sent: Wednesday, November 6, 2019 7:42 PM
To: Public Comment
Subject: Aloha Stadium-area Development

Aloha,

I strongly believe the New Aloha Stadium Entertainment District should include many more than 2,000 affordable housing units (I believe that there is a recognized 17,000-unit or even closer- to-25,000-unit shortfall in affordable housing on Oahu spanning the next several years).

Since the redevelopment takes place on 98 acres of state-owned property and will have discrete rail-station access, this is a unique, can’t-miss opportunity for the state to make available a paradigm-changing number of affordable housing units (80% AMI or below), thus mitigating Oahu’s critical housing shortfall.

Wilson-Okamoto folks, you seem to be the state’s agent here, and I recognize your company name as a long-term powerhouse in Hawaii’s business economy. Earn your contract monies by listening to the voices of the people by, for example, quantifying the probable impact of Aloha Stadium on the state’s published housing demand…also not incidentally, use your professionalism to convince state authorities, via the EIS, that this development, if done properly, will have a direct and observable effect on our loss of young, productive citizens, men and women, and their families to other climes and working opportunities.

I, Bob Stiver, don’t need “affordable housing”: as a now-retired federal bureaucrat, I "got mine"— a fine home in Pearl City, larger than I need. I’m interested, and I want you, and the state, to be viscerally interested, in the younger generation!

Mahalo and best wishes for success,

Robert H. Stiver
Pearl City
455-9823

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10422-01
December 23, 2020

Robert H. Stiver
bobfromoahu@gmail.com

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai`i

Dear Mr. Stiver:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai`i Administrative Rules, Title 11, Chapter 200.1, Section 24.

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We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects
On behalf of the vendors of the Aloha Stadium Swap Meet & Marketplace, we respectfully submit the following comments in regard to the "New Aloha Stadium Entertainment District (NASED)"

Given that the development of the NASED will greatly affect us, we see this matter as critical to our lives and our livelihoods.

We strongly support "Option A" of the redevelopment plan for the following reasons:

- The Swap Meet at Aloha Stadium has a proud history over the last 40 years of serving the Hawaii community, visitors to our state, and supporting the lives of the vendors.
- The tropical weather, combined with the outdoor shopping environment, has created a unique shopping experience. We have identified that this unique experience is enjoyed by many of our visitors, especially those visiting from across the globe. We believe this has played a large part in maintaining an economically sustainable operation.

We also have the following concerns:

- Parking lot sizes should be the same as it is currently. This will allow our vehicles to be safely parked within the stalls while serving our customers.
- The current opening days and hours are suitable and preferred for the Swap Meet.

We appreciate the time and effort all members of the Aloha Stadium Authority, and Governor Ige have put into the Aloha Stadium’s continuous maintenance and improvements. We want the NASED to be a successful project that benefits all the stakeholders.

We strongly believe that the people of Hawaii and our visitors should continue to have a pleasant and unique outdoor shopping experience. Shopping at the Aloha Stadium Swap Meet has always been an Aloha way of life and part of the Hawaiian Lifestyle – as it has been and will be.

Respectfully,

The undersigned vendors of The Aloha Stadium Swap Meet
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<tr>
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<th>Name</th>
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<td>Sang Young Pyo</td>
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<td>Ariel Asunción</td>
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<td>Manuel silva</td>
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<tr>
<td>2772</td>
<td>Alfonso Sanchez</td>
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<td>(323) 777-1765</td>
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<td>Hyun Kim</td>
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<td>Chris Ng</td>
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<td>Yvonne Allen</td>
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<td>Peter Yvonne Hui</td>
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<td>Kong, Lizzy &amp; Boy Tim Huang</td>
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<td>Vilma S. Bongolan</td>
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<td>Jeannie Tang</td>
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<td>Judy Song</td>
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Aloha Stadium Swap Meet Vendors

Subject: Environmental Impact Statement Preparation Notice:
New Aloha Stadium Entertainment District (NASED)
Hālawa, Oahu, Hawai‘i

To Aloha Stadium Swap Meet Vendors:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawai‘i’s Administrative Rules, Title 11, Chapter 200.1, Section 24.

Your comments, along with this response, will be reproduced and included in the forthcoming Draft Programmatic EIS. The Draft Programmatic EIS, including the various technical studies associated with it, will be available for review on Office of Environmental and Quality Control website following its publication in The Environmental Notice.

We appreciate your interest and participation in this environmental review process.

Sincerely,

Keola Cheng
Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects

1907 S. Beretania Street, Suite 400 • Honolulu, Hawaii • 96826 • (808) 946-2277
SUBJECT: EISPN: PROPOSED NEW ALOHA STADIUM ENTERTAINMENT DISTRICT (NASED) – SCOPING MEETING, SEPTEMBER 25, 2019

Residents of Crosspointe (Kanahou) have to sit in the same lane of traffic as those entering the stadium and it always gets congested.

Coming from town and taking the Kalakaua cutoff, there is a giant pothole on Kalioune St. that continues to grow, and no one has addressed it despite reporting to the pothole hotline.

Parking in neighboring residential areas is becoming a growing problem.

(include additional sheets as necessary)

PLEASE PRINT:
Name: __________________________ Phone: __________________________
Organization: __________________________
Mailing Address: __________________________
Email: __________________________

Please submit comments by November 7, 2019, or email NASED EIS@wilsonokamoto.com

*Receipt of emailed comments will be confirmed via e-mail. If you do not receive a confirmation message, please contact our office (see contact information, above).
SUBJECT: EISPN: PROPOSED NEW ALOHA STADIUM ENTERTAINMENT DISTRICT (NASED) — SCOPING MEETING, SEPTEMBER 25, 2019

What are you going to do about the Swap Meet?

I think you should also keep the Swap Meet for some people selling at the Swap Meet is their 2nd job cause they have to pay their bills and put food on the table. List look toward to going to the Swap Meet.

What are you going to do about the 50th state fair?

I think you should at least leave room for the fair to still be there. I think it would be good.

To Whom It May Concern:

Thank you for participating in the scoping process for the subject Environmental Impact Statement (EIS). We acknowledge your comments and concerns, they have been considered in the preparation of the Draft Programmatic EIS with regard to meeting content requirements prescribed in Hawaii’s Administrative Rules, Title 11, Chapter 200-1, Section 24.

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Director of Planning

cc: Chris Kinimaka, Department of Accounting and General Services
    Stacey Jones, Crawford Architects

Please submit comments by November 7, 2019, or email

*NPS: EIS@wilsonokamoto.com*
NEW ALOHA STADIUM
ENTERTAINMENT DISTRICT

PROGRAMMATIC DRAFT ENVIRONMENTAL IMPACT STATEMENT

WILSON OKAMOTO CORPORATION | CRAWFORD ARCHITECTS